National Incident Radio Support Cache User's Guide

2007

National Interagency Incident Communications Division
National Interagency Fire Center
3833 S. Development Ave.
Boise, Idaho 83705

CDO Phone (208) 387-5644
Toll Free 1-877-775-3451
Fax (208) 387-5892

March 2007
NFES 0968

National Incident Radio Support Cache (NIRSC) Users Guide:

The 2006 all-risk season supported fires, law enforcement, forest pest management, military communications, support to National Communication System (ESF2), ongoing technical support to the EPA, as well as several overseas projects in Honduras and Australia.

While it wasn't the largest season for incident communication resources orders, there were some challenges.

* The Cache operated 100% VHF narrowband for the third year
* 207 Starter Systems and 900 issues were deployed from the National Cache
* 600 hours and 1300 missions of infrared detection and mapping flights
* Both Infrared aircraft were equipped with Phoenix Infrared Systems

It is important that all personnel involved in incident communications keep themselves up-to-date on the changes in equipment and technology. As an example, all National Cache VHF systems are operating in the narrowband analog mode. Several courses are scheduled for this year. I recommend that any Communications Unit Leaders that have not been out for a few years, or Communications Unit Leaders and Communications Technicians who would like some first hand experience with the equipment, give Mark Hilton, Chief, Branch of Technical Training a call at 208-387-5707 and reserve a slot in one of our seminars.

I thank all of you for the work that you do in incident communications. Your role is vital and brings together all the functions under the Incident Command System. Thanks for your dedication and hard work.

If you have any questions for the National Incident Interagency Communications Division, please feel free to call me at 208-387-5485 or the Communications Duty Officer at (208) 387-5644 or the toll free number at 1-877-775-3451.
E-mail: sjenkins01@fs.fed.us.

Sincerely,

/s/ Stephen M. Jenkins

Stephen M. Jenkins
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 #0968

TABLE OF CONTENTS

Introduction 1
NEW FOR 2007 2
NIRSC Assistance Numbers 3
National Air Frequency Guidelines 4
Forest Health Protection (FHP) Projects 6
General Information about Radio Batteries 8
Radio Battery Matrix 9

Communications Coordinator 10

National Incident Radio Support Cache
- NIRSC Information 12
- 4305 Mast, Antenna 13

National Incident Radio Support Cache Equipment Descriptions
- 4244 Logistics Radio Kit 14
- 4248 Logistics Repeater Kit 15
- 4253 UHF Link Kit 16
- 4281 Crossband Link Kit 16
- 4300 Ground VHF-AM Base Station Kit 17
- 4312 Command Repeater/Link 17
- 4330 Remote Kit 18
- 4370 Ground Aircraft Radio/Link Kit 19
- 4381 CMD/TAC Radio Kit 19
- 4390 ICS Starter System 21
- 4410 Public Address Kit 21
- 4499 Air Attack Kit 22
- 4630 Satellite Iridium Phone Kit 23
- 4800 Portable IR Downlink Kit 23
- MAFFS Base Station 24

General Communications Conditions and Solutions 25
- Drawings:
- (1) Command/Tac Radio Kit and Command Repeater/Link 28
- (2) One-Hop Logistics Repeater With Logistics Radio Kit 29
- (3) Command/Tac Radio Kit Command Repeater/Link With Remote Kit 30

(4) Incident Operations Area To ICP/ICC Backbone 31
(5) Large Incident Area Operations Area Linking System 32
(6) Extended or Multiple Incident Operations Area Linking System 33
(7) Extended Incident Operations Area Linking System 34
(8) Extended or Multiple Incident Operations Area Linking System 35

Aviation Communications Conditions & Solutions 36
Aircraft Equipment Conditions 37
Drawings:
(9) Ground VHF-AM Base Station Kit 39
(9) Ground to Aircraft Radio/Link Kit (as base station) 39
(10) Ground to Aircraft Radio/Link Kit (using linking) 40
(11) Ground to Aircraft Radio/Link Kit (extended range) 41
(12) Portable IR Downlink Kit 42

Kit Inventories 43

4244 Logistics Radio Kit 44
4248 Logistics Repeater Kit 45
4253 UHF Link Kit 46
4281 Crossband Link Kit 47
4300 Ground VHF-AM Base Station 48
4312 Command Repeater/Link Kit 49
4330 Remote Kit 50
4370 Ground Aircraft Radio/Link Kit 51
4381 CMD/TAC Radio Kit 53
4390 ICS Starter System 55
4410 Public Address Kit 56
4499 Air Attack Kit 57
4630 Satellite Iridium Phone Kit 58
MAFFS Base Station (TAF-550) 59

Kit Installation Instructions 60

4248/4312 VHF/UHF NIRSC Stand Alone Repeater Setup 61
4312 VHF Repeater/Link Setup 63
4253 +15 Volt Dual Battery Set Configuration 65
4253 UHF Link 66
4300 Ground VHF-AM Base Station Kit 67
4330 Remote Kit 69

4370 Ground Aircraft Radio/Link Kit 72
4410 Public Address Kit 79
4499 Air Attack Kit..... 81
4630 Satellite Iridium Phone Kit 85
4800 Portable IR Downlink Kit 87
MAFFS Kit 88
Appendix A 90

NIICD Hotsheet

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

http://www.fs.fed.us/fire/niicd/Hotsheet/Hotsheet.html

NIICD Documents

Visit NIICD's Documents page for instructions, forms, and helpful information.

http://www.fs.fed.us/fire/niicd/documents.html

INTRODUCTION

This booklet is designed to aid in the evaluation of incident communications needs for users of the National Incident Radio Support Cache (NIRSC).

To use this guide:

1. Read the descriptions of incident communications conditions. Find those most closely reflecting your needs.

2. Each description corresponds to one or more drawings showing general and special purpose equipment applications. Match the condition to the drawing and verify the equipment specified will meet your needs.

3. When ordering equipment from the NIRSC, use the NFES catalog numbers indicated on the drawings or in the descriptions section of this booklet. The NFES numbers must appear on your Resource Order. One request number per kit only.

4. The National Interagency Incident Communications Division Communications Duty Officer (NIICD-CDO) is available 24 hours per day year around. NIICD-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 NIICD-CDO upon arrival at incident to provide assignment location and phone number. All provided information is logged and updated daily.
   NOTE: Those communications personnel not familiar with NIRSC equipment or who are not experienced are required to contact the NIICD-CDO for assistance. See NIICD ASSISTANCE NUMBERS (p. 3) for phone listings.

NEW FOR 2007

Changes are being made to NFES 4312 Command Repeater Kits. As these units are refurbished, all of the UHF Link Hardware and necessary ancillary link equipment, will be pre-installed. These kits will now be known as NFES 4312 Command Repeater/Link. NFES 4253 UHF Link Kits will still be available in limited numbers. NFES 4390 Starter Systems that are currently pre-positioned DO NOT have link hardware in their NFES 4312 Command repeaters. Contact the NIICD-CDO when ordering NFES 4253 UHF Link Kits.

Radio passwords have been changed to all zeroes for the 2007 Fire Season.

All NIFC VHF-FM frequencies continue to be in narrowband configuration.

NIICD has 10 Technisonic TDFM-136 aviation VHF-FM radios configured specifically for homeland security/law enforcement support. These radios are P25 digital compliant. However, they are not capable of being encrypted. The only difference between these 10 homeland security radios and the remaining NIICDs TDFM-136 radios is that the homeland security radios are NVG compliant.

MAFFS Base Station kits now have 10 King EPH radios.

NIRSC ASSISTANCE NUMBERS

The numbers listed below are for your general use for assistance from the staff at the National Interagency Incident Communications Division (NIICD) and the National Incident Radio Support Cache (NIRSC) at NIFC.

CDO: Phone:(208) 387-5644 for incident related business only. All other calls to the NIICD should be directed to individual division numbers

Toll Free: 1-877-775-3451
Fax: (208) 387-5892

For specific assistance from the National Interagency Incident Communications Division, use the following numbers: area code (208)

DIVISION NUMBERS:

Branch of Communications Maintenance:	387-5856
Branch of Communications Operations:	387-5947
	387- 5858
Branch of Engineering and Development:	387-5720
Branch of Infrared:	387-5647
Branch of Rework:	387-5645
Branch of Avionics:	387-5648
Branch of Technical Training:	387-5707

NATIONAL AIR FREQUENCY GUIDELINES

These guidelines are intended to clarify the use of the National VHF-FM Air Frequencies and the VHF-AM (Victor) frequencies. Each is authorized for specific uses, even though they are listed as "national".

AIR GUARD FREQUENCY

There is one common air guard frequency - 168.6250. It is found on the last channel of all NIRSC radios. This frequency is authorized for:

1. Emergency air-to-air initial contact.
2. Emergency ground-to-air communications.
3. Initial call, recall and redirection.

NATIONAL FLIGHT FOLLOWING

There is one common national flight following frequency - 168.6500.
This frequency is authorized for:

1. Flight-following, dispatch, and/or re-direction of aircraft.
2. Air-to-ground and ground-to-air administrative traffic.

(This frequency is not authorized for ground-to-ground traffic.)

VHF-FM

In the NIRSC radios, national VHF-FM air frequencies are located in GROUP 3. These frequencies have specific uses. Prior to use, you MUST contact the NIICD-CDO.

VHF-AM (Victor)

There are FIVE national AM frequencies. The use of these frequencies is restricted to air operations only, **no exceptions!** These frequencies are assigned to specific functions. For additional VHF-AM frequencies, the COML should make requests through the next higher authority. In multi-incident situations, this contact would be the Communications Coordinator (COMC). If no COMC has been assigned, contact the NIICD-CDO. The NIICD-CDO is authorized to obtain additional VHF-AM frequencies for the GACCs (Geographic Area Coordination Center) which will then assign those frequencies.

NOTE: All Aviation Frequencies Will Be Ordered Through the Dispatch Ordering System to the NIICD-CDO.

FOREST HEALTH PROTECTION PROJECTS

The NIRSC supports the Forest Health Protection Program with basic communications equipment. The NIRSC can be contacted with requirements or needs to customize an order to ensure it will be properly placed with the NIFC National Interagency Coordination Center (NICC).

All requests for equipment must be submitted through the local dispatch office and the Geographic Coordination Center, then to NIFC-NICC. Preliminary letters will be accepted by the NIRSC for informational purposes only, as will e-mail messages to sjenkins01@fs.fed.us. ***Equipment will not be issued against the letter or e-mail.*** A Resource Order, placed through the formal ordering process, is necessary.

The NIICD-CDO will assist FHP users with system design information, layout and ordering, in order to meet the specific requirements of each particular project. Users are requested to contact the NIRSC at least 1-2 months in advance of a project(s) to allow for sufficient design, implementation and ground shipping of equipment.

The following equipment is available from the NIRSC:

4381 VHF radios (16/kit)
4312 Command Repeater/Link
4300 Ground Aircraft Base Kit (base station only)
4330 Remote Kit

The above NFES items are the standard kits to support FHP projects. Other types of equipment are available if the project has unusual requirements. These other kits are described under the section EQUIPMENT DESCRIPTIONS in this catalog.

Radios are issued in kits of 16 each, but can be supplemented with individual radios if needed. It is preferred that radios be ordered in kit lots of 16. The radios will come with full, reusable clamshells which use AA batteries, plus one change of AA batteries for each radio. Please return the reusable clamshells with the kit. If you require additional batteries, above what is provided in the kit, place a resource order for NFES# 0030, AA batteries, or purchase the batteries locally.

The radios will be pre-programmed with NIRSC command/tactical frequencies. However, given sufficient time, the NIRSC will custom program frequencies in each channel. The repeater frequencies must remain as they are assigned.

The FHP equipment in the NIRSC must be shared with many FHP users. It is requested that required time frames for project use be kept to a minimum. When the project is completed, please expedite shipment of the equipment back to the NIRSC. The requesting user will pay for shipping to and from the NIRSC. There is a charge for equipment repair and parts. Costs for use of the equipment include replacement of batteries and lost kit accessories or capitalized equipment.

GENERAL INFORMATION ABOUT RADIO BATTERIES

When ordering batteries, round the order to the next full STD PK. (See Standard Pack -- STD PK--entry in the Radio Battery Matrix or see listing in the GENERAL SECTION of the NFES Catalog under Battery, Radio.)

Alkaline batteries are not considered hazardous waste, except in California. These batteries should be disposed of at the incident.

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, for our application, can probably be stored in our application for four years, however the life will be noticeably shorter.

Repeater batteries should last 5-7 days under heavy usage. Radio batteries should easily last a shift (usually 12 hours).

Battery life with the clamshell-type battery will depend entirely upon the AA cells installed, and the type of radio used. The new P25 radios use more batteries than the analog radios.

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 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 test the batteries in a repeater with a voltmeter put the repeater in transmit condition to apply a load to the batteries to get a correct reading.

UHF/VHF Repeaters -- replace batteries if the voltage is at 10.5 volts with the transmitter operating. Starting voltage is about 15 volts with the transmitter operating.

RADIOS -- The transmit LED is the best indicator of battery life. If the light holds bright for 3 seconds while transmitting, the battery should be in good shape. Don’t rely on the battery gauge on the Racal radio since it is designed for use with the Lithium-Ion rechargeable battery.

RADIO/REPEATER BATTERY MATRIX

CLAMSHELLS: NFES #5083 for ICOMS (12/box) Return KIT clamshells!
NFES #1034 for KINGS (12/box) Return KIT clamshells!
NFES #4165 for RACAL (each) Return KIT clamshells!
NFES #4231 for EFJOHNSON 5100 (each) Return KIT clamshells!
NFES #4541 for MOTOROLA XTS-3000/DATRON GUARDIAN 25 (each) Return KIT clamshells!

Frequently used batteries are listed below by type and NFES #.

NFES#	0030	1023	1233
VOLTAGES	1.5V	7.5V	6V (Hotshot)
STD. PK.	24/PG	4/BX	4/BX
RADIOS			
ICOM (clam)	10		
KING (clam) 9-cell (VHF/UHF)	9		
RACAL (clam)	10		
XTS-3000/5000, EFJ 5100, DATRON GUARDIAN 25 (clam)	12		
KITS			
GRND A/C 4370, 4300	80	4	
P.A. 4410			2
REMOTE 4330		2	2
REPEATERS & LINKS 4248, 4253, 4312, 4281		4	

MOST BATTERY DISPOSAL SHOULD BE HANDLED AT THE INCIDENT TO SAVE SHIPPING COSTS.

COMMUNICATIONS COORDINATOR (COMC)

Duties and Responsibilities

1. Manages the allocation of communications resources at the Geographic Area level. This includes communications equipment, communications personnel and associated supplies. The COMC reports to the NIICD-CDO and directly supports the assigned Geographic Area. COMC's will not be assigned to specific incidents or to Area Command. Orders for this position should originate from the requesting Geographic Area. The order then will go to NICC who will then forward the order to the NIICD-CDO to be filled.

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 COMC's assigned to the affected Geographic Areas.

2. Manages the frequency resources for all incidents under assigned jurisdiction. This includes all frequencies for ground tactical, command, logistics, and air operations.

NOTE: During complex situations, the COMC will request additional qualified personnel to be assigned as field COMC's. Any situation involving large air operations will require that the Communications Coordinator (COMC) request an Aviation Frequency Coordinator just for air operations.

3. Maintains an accurate inventory of all communications equipment assigned to complex(es) under their control. This includes equipment assigned to all incidents within the complex(es).

4. 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. Maintains daily contact with NIICD-CDO.

NOTE: This may entail pooling Communications Technicians (COMT) from existing incidents to better utilize this resource.

5. Provides problem solving recommendations and advice on communications issues to the respective Geographic Area Coordinators, the Area Coordinators, the Area Command Teams managing an incident complex, and/or to incident management teams within a com plex or an incident. National as well as geographic area priorities will be considered when making recommendations and/or providing advice.

6. Provides the incidents with assistance in obtaining specialized communications equipment.

NATIONAL INCIDENT RADIO SUPPORT CACHE

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. Frequencies are cleared by the NIICD-CDO.

STARTER SYSTEMS (NFES #4390):

A starter system consists of 10 boxes of assorted equipment, and is ordered as a system. A starter system contains 1 VHF repeater/link and 1 UHF repeater. Generally the frequency assignments for these repeaters will be one of the standard VHF command assignments (C1 through C7) and one of the standard UHF assignments (L1 through L7).

When ordering a starter system, appropriate frequency assignments must be obtained by contacting the NIICD-CDO or the appropriate COMC when assigned. The resource order will indicate which frequency pair has been assigned as in the following example (C4/L4). When possible please provide a Latitude and a Longitude for each repeater set up in the field. Starter Systems may not always contain 10 kits and 8 sets of masts (due to equipment availability).

NOTE: In areas with extreme frequency congestion, the NIICD-CDO or COMC will advise incidents/COMLs of available frequencies.

LOGISTICS SYSTEM:

A Logistics System is a part of every Starter System. It consists of 1 UHF Logistics Repeater and 1 kit of 16 UHF Logistics radios. <u>If you do not need logistics equipment, you MUST order command equipment by individual kit catalog numbers.</u>

ADDITIONAL REPEATER:

When needed for an incident, the request will be evaluated and supported with another single frequency repeater. Order as a single resource item:

Command Repeater/Link - NFES #4312; Logistics Repeater - NFES 4248.

USER'S GUIDE (NFES #0968):

The User's Guide is located in all Command Repeater/Link Kits (NFES #4312) and can also be ordered through the Great Basin Warehouse (GBK).

COMMUNICATIONS DUTY OFFICER:

The NIICD-CDO, as much as possible, will maintain compatibility of new equipment orders with equipment already on an incident.

DEMOB:

All cache equipment must be returned to the NIRSC after each incident, for re-work.

FIELD ASSISTANCE:

The NIICD-CDO will coordinate field assistance for incidents. The NIICD-CDO can be contacted at(208) 387-5644 or toll free 1-877-775-3451.

(4305) MAST, ANTENNA

The following kits come with at least one set of three masts.

4248 Log Repeater
4312 CMD Repeater/Link (2 sets)
4330 Remote
4253 UHF link
4300 Ground VHF-AM Base Station
4281 Crossband Link Kit (2 sets)
4370 Aircraft Link (2 sets)
4390 Starter System (7 sets)
4630 Satellite Iridium Remote Kit
4800 Portable IR Downlink Kit
MAFFS Base Station (3 sets)

The NIRSC tries to keep a good supply of these masts on hand to support our kits. However, many do not get returned from incidents and we have to replace them. Shipping them individually is not recommended. It is highly recommended that they be returned with the kits they went out with.

Do not return masts that are bent, squashed, badly out of round or otherwise not readily reusable.

EQUIPMENT DESCRIPTIONS

4244 Logistics Radio Kit

This radio kit is designed to be used for incident support personnel, e.g., Plans, Logistics, Finance. This kit contains 16 UHF radios. The radios operate independently or in conjunction with UHF Repeater Kit NFES# 4248.

Kits contain radios which have all NIRSC frequencies, including all simplex and repeat pair frequencies.

NIRSC frequencies must be cleared for use by the NIICD-CDO. Frequency charts are in the kit.

The following frequency scheme indicates the channel on which the repeater frequencies will be found:

REPEATER	RADIO CHANNEL
L1 Logistics Repeater	Group 1 Ch 2
L2 Logistics Repeater	Group 1 Ch 4
L3 Logistics Repeater	Group 1 Ch 6
L4 Logistics Repeater	Group 1 Ch 8
L5 Logistics Repeater	Group 1 Ch 10
L6 Logistics Repeater	Group 1 Ch 12
L7 Logistics Repeater	Group 1 Ch 14

King Radios

The NIRSC has kits of 210 channel EPV radios. These radios have 15 groups of 14 channels. Groups are accessed by turning the radio on, then, when GRP appears on the display, press the number on the front pad for the group desired. If radio shows a channel number, press #, then press number on the front pad for group desired.

Refer to the kit frequency charts for additional information.

The EPV radios have a TA toggle switch on top. This is the talk-around switch. NIRSC recommends NOT USING this switch. When activated, the radio receives and transmits on the receive frequency.

These radios are password protected. The NIICD-CDO will give the authorization code to communications personnel upon request.

NOTE: All NIRSC UHF King Radio Kits will use the 9-cell battery clamshells. Do not use more than 9 cells!

EF Johnson Model 5133

These radios have 16 groups of 16 channels. Groups are accessed by turning the radio on and pressing the front toggle switch either up or down.

Refer to the kit frequency charts and diagrams for additional information.

4248 Logistics Repeater

The Logistics Repeater must be used in conjunction with a Logistics Radio Kit, NFES #4244, or the Remote Kit NFES # 4330 with appropriate UHF radio installed in the remote. Additionally the Logistics Repeater kit NFES #4248 is to be used to link two or more Command Repeater/Link NFES #4312s together. It is a battery operated portable repeater kit. (See drawings # 7 & 8, pages 34 & 35).

Uses include:

- ICP to Expanded Dispatch Center
- Staging area to ICP
- Helibase to ICP
- Helispots to ICP
- Ground Support Unit
- Outlying service functions to the Incident Communications Center (ICC)

- Non-fire related incidents can utilize these kits in command/tactical situations.

Resource Orders should indicate which frequency is needed, (L1, L2, etc.).

NIRSC frequencies must be cleared for use by the NIICD CDO.

Logistics repeaters have the following frequency designators:

REPEATER	RADIO CHANNEL
L1 Logistics Repeater	Group 1 Ch 2
L2 Logistics Repeater	Group 1 Ch 4
L3 Logistics Repeater	Group 1 Ch 6
L4 Logistics Repeater	Group 1 Ch 8
L5 Logistics Repeater	Group 1 Ch 10
L6 Logistics Repeater	Group 1 Ch 12
L7 Logistics Repeater	Group 1 Ch 14

4253 UHF Link

The UHF Link kit is used to link UHF-FM and VHF-FM together to extend area coverage for large incidents. Coordinate with the COMC or NIICD-CDO before ordering.

4281 Crossband Link Kit

The crossband link is designed to provide support for special operations on an incident that requires UHF frequency to VHF frequency conversion. This unit is in a Daniels rack with both a UHF transmitter and receiver and a VHF transmitter and receiver and can be programmed with special frequencies. Please contact the NIICD-CDO for ordering, designing and frequency coordination. This unit is not a repeater.

4300 Ground VHF-AM Base Station Kit

The Ground VHF-AM Base Station kit is a portable 760-channel VHF-AM base station. This kit cannot be linked or remoted. Kits are used primarily as a base station to contact aircraft on Forest Health Protection projects and on incidents. Base stations will transmit 7 watts, are capable of 10 pre-set channels, will scan, and operate using 115 Vac or 12 VDC through an automobile accessory plug-in. Four (4) handheld ICOM VHF-AM radios are included, as well as T-cards for radio check-out.

If this kit is to be used as an FAA portable control tower, the NFES 4300 order MUST be placed by the incident COML for the FAA controller.

4312 Command Repeater w/Link

Stand Alone Repeater Configuration:

The Command Repeater must be used in conjunction with a Command/ Tactical Radio Kit, NFES #4381. The kit is a battery operated portable repeater designed for mountainous terrain and/or extended area coverage applicable to incident operational requirements. NIRSC Command repeater/Links will link to other VHF/UHF Repeaters using the UHF Link Modules included in the NFES 4312 kit. Repeaters should be ordered by NFES #. NIRSC frequencies must be cleared for use BEFORE shipment is made. Call the NIICD-CDO for clearance. The NIICD-CDO (208) 387-5644 will assign a frequency if not indicated on the Resource Order.

All Command Repeater/Links are single channel. If an additional repeat frequency is necessary, a separate Command Repeater/Link must be ordered. Orders will be filled based on priority need. Frequencies must be coordinated to reduce interference problems. All repeaters are capable of being tone-controlled (decode only). A tone-controlled repeater will operate as a normal repeater (carrier squelch) when not in the tone mode. Call the NIICD-CDO for more information on tone-control applications.

NIRSC Channel Plan: Radios are configured to match up with repeaters as follows:

Radio	Radio
ALL	ALL
Cmd Repeater C1 Group 1 Ch 6	Cmd Repeater C5 Group 2 Ch 6
Cmd Repeater C2 Group 1 Ch 8	Cmd Repeater C6 Group 2 Ch 8
Cmd Repeater C3 Group 1 Ch 10	Cmd Repeater C7 Group 2 Ch 10
Cmd Repeater C4 Group 1 Ch 12	

Note: If a special repeater is being sent to your incident the COML will need to program the radios with the frequencies.

Note: Verify that the UHF Modules are in the "OFF" position when used as a stand alone command repeater.

Repeater and Link Configuration:

The UHF Link is used to link UHF-FM and VHF-FM together to extend area coverage for large incidents.

Uses include:
It can be used to link two (2) or more VHF-FM Command Repeater/Links (NFES# 4312), using NIRSC frequencies.

It can be used to link one (1) or more VHF-FM Command Repeater/Links in configuration with a UHF Repeater to esatblish commu- nications with the incident operations area back to an ICP located in difficult terrain.

The Command Repeater/Link (NFES# 4312) contains two (2) UHF modules (1-RX and 1-TX), that are permanently installed into the (NFES# 4312) Daniels repeater backplane along with two (2) RF cables that connect the modules to the antenna relay. A UHF whip antenna and a UHF Yagi antenna with 20 foot RF cables are included in the Command Repeater/Link NFES# 4312 shipping container to expedite all installation options.

4330 Remote Kit

The Remote kit can be used with VHF-FM (tactical) and UHF-FM (logistics) radios. Use of this kit, in conjunction with NIRSC radios, allows a remote base station to be installed up to a half mile away from the ICP, camp, helibase, etc. If more field wire is obtained, runs up to several

miles can be made.

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 King radios are included in the chassis box, eliminating the need for multiple interface cables.

Several antenna options are available including omni-directional UHF and VHF antennas and a breakdown UHF Yagi directional gain antenna.

4370 Ground Aircraft Radio/Link Kit

This Daniels kit is a portable, battery operated, all in one, VHF-AM aircraft base station and UHF-FM link. All aircraft kits operate as a base station or as a crossband link. There are two sets of antennas (VHF-AM and UHF-FM) for use in the link configuration. All kits include four (4) handheld ICOM VHF-AM radios.
The Ground Aircraft Radio/Link uses a 12 Volt DC power source. The unit can be operated from the supplied alkaline batteries (@ 15 Volts) 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. Additional ICOM radios can be ordered to supplement a full kit. Call the NIICD-CDO for ordering assistance. Supplies are limited, therefore orders will be filled on a priority basis.

4381 Command Radio Kit

This VHF Radio kit is designed for use in command and tactical operations of an incident. Each kit contains sixteen (16) handheld radios. All radios are configured with all tactical, command and national air frequencies. The radios in each kit are the same manufacturer and model.

The issue document that you receive with these kits will reference a subkit, i.e. (4353) issued with the kit. This subkit is not a separate item and therefore not visible or trackable. It is used to capture costs of the accessories for the different radios that you receive. It is for NIRSC use only. Frequency charts are included in the kit, as well as T-cards for radio checkout.

Boxes are labeled on the outside to indicate the type of radios contained inside according to the following convention:

4381-K __ __ __ (K = King, R = Racal, J = EF Johnson, D = Datron Guardian 25, M= Motorola, KD=King DPHx)

NIRSC frequencies must be cleared for use BEFORE shipment is made. Call the NIICD-CDO for clearance.

The following lists the repeater frequency designation with the corresponding radio channel assignment.

Radio	Radio
ALL	ALL
Cmd Repeater C1 Group 1 Ch 6	Cmd Repeater C5 Group 2 Ch 6
Cmd Repeater C2 Group 1 Ch 8	Cmd Repeater C6 Group 2 Ch 8
Cmd Repeater C3 Group 1 Ch 10	Cmd Repeater C7 Group 2 Ch 10
Cmd Repeater C4 Group 1 Ch 12	

Command/Tac Radios:

Command/Tac radios are programmed by the NIRSC to be compatible with each system in which they are included. King EPH series radios are 210 channel and are capable of operating in either wide or narrowband mode. The Racal, Datron, and the EF Johnson are 256 channel radios capable of operating in either wide or narrowband mode as well as digital.

The King EPH radios have 15 groups of 14 channels. The King DPH Radios have 25 groups of 16 channels. The Racal, EF Johnson, and Datron Guardian 25 have 16 groups of 16 channels. All radios are password protected and cannot be field programmed without an authorization code. The NIICD-CDO will supply the authorization code only to communications personnel.

The NIRSC recommends that users limit the number of scanned channels to 3 and to use the HIGH POWER TX mode sparingly. These options will increase the load on the batteries which will rapidly reduce battery life.

NOTE: 1.) All clamshells included in radio kits must be re-

turned. 2.) The NIRSC King Radio Kits use 9-cell clamshells only!! Do not use more than 9 cells!

4390 Starter System - ICS Command/Logistics Radio System

The starter system is designed to be the initial system to support basic incident communications requirements. The system supplies equipment which will facilitate immediate communications for command, tactical, logistical and ground-to-air needs. The Starter System consists of:

1 Command Repeater/Link
3 CMD/TAC Radio Kits (total of 48 radios)
1 Ground Aircraft Radio/Link Kit (with 4 ICOM radios)
2 Remote Kits
1 Satellite Iridium Phone Kit (when available)
1 Logistics Repeater
1 Logistics Radio Kit (total of 16 radios)

A logistics capability is sent with all Starter Systems, i.e., logistics repeater, logistics radio kit. Use of NIRSC frequencies must be cleared by the NIICD-CDO prior to shipment. The NIICD-CDO will assign frequencies if not indicated on the Resource Order.

A NIRSC User's Guide (NFES# 0968) is included in each Command Repeater Kit.

In the case of a multi-branch or multi-incident complex, if several ICS Starter Systems are ordered, or if communications personnel are not familiar with NIRSC equipment, the NIICD-CDO must be contacted for ordering, system planning and frequency coordination assistance.

NIICD-CDO contact numbers:
CDO Phone:(208) 387-5644
Toll Free: 1- 877-775-3451

4410 Public Address Kit

The Public Address kit is primarily used at the ICP or in staging areas which house large numbers of personnel. It allows for the broadcasting of information or paging from a central point. The kits can be powered by either AC or batteries.

4499 Air Attack Kit

The 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 the 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 Technisonic Industries radios. Each kit will have either two TFM-138B or two TDFM-136 radios. There are no external markings on the shipping box as to which type radio is enclosed. Requests for a kit containing a specific model radio are not permitted.

The NFES 4499 Air Attack has a Dual Audio Control (COM/FM1/FM2/ AUX1/AUX2/SC) for the pilot and co-pilot/ATGS, connectors for two AUX-FM type portable radio adapters, and two 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 headset. Both passengers can operate all radios through the copilot/ ATGS's transmitter selector. The "SC" position is simulcast transmission on both COM (aircraft VHF-AM) and FM1. Each kit includes two passenger headset adapters, two PT-300 PTT adapters, two BNC barrel connectors (for AUX-FM antenna connections), and instructions. Two (2) externally mounted VHF antennas are also required for operation.

For non-fire related incidents the VHF-VHF radios could be changed to give the kit a VHF-UHF capability. An external UHF antenna would be necessary on the aircraft. These requests will be done only on a case-by-case basis. Coordination with the NIICD-CDO is required.

This kit will ONLY be installed in aircraft meeting the National Air Tactical/ Reconnaissance Standards and passing an avionics inspection by a Forest Service/OAS avionics inspector.

The NFES 4499 Air Attack Aux-FM portable radio adapter connectors accept the same adapter connections used in all helicopters. Contact the

4630 Satellite Iridium Phone Kit

There are 35 Satellite Iridium Phone Kits ready for issue. These kits will be sent out with the 4390 Starter Systems as long as they are available.

4800 Portable IR Downlink Kit

The Portable IR Downlink kit is designated for use **only** by Infrared Interpreters (IRIN). It is used to transfer data from the infrared aircraft flying fire mapping missions to the IRIN on the ground, where delivery time is critical. All Kits (20 ea.) are designed with the novice user in mind. Easy to follow setup instructions are included so that the user need only to set up the antenna, connect a CAT 5 cable to the computer, and turn it on. All data will be transferred by the technician in the aircraft to the "My Documents" directory on the included PC in the ground station.

NIICD-CDO for availability of King & Racal AUX-FM adapter cables.

MAFFS Base Station

There are four (4) MAFFS Base Stations ready for issue. MAFFS stands for Modular Airborne Fire Fighting System and is used in conjunction with Military C-130 Airtanker use. MAFFS Base Stations will only be issued to tanker bases where MAFFS operations are being conducted. A spare base station is available for non-MAFFS use.

This portable kit is a combination 138 to 174 Mhz VHF-FM and 760 channel VHF-AM base station. The kit cannot be linked or remoted. Kits are used primarily for MAFFS Tanker Bases and other sites needing both VHF-FM and VHF-AM communications. The VHF-FM radio is a Technisonic TFM-138B airborne radio capable of transmitting 10 watts, 120 preset channels, simultaneous Air Guard (168.6250) reception, and scanning. The VHF-AM radio will transmit 7 watts, is capable of 10 pre-set channels, and will scan. The TAF-550 operates using 115 Vac or 24 VDC/12VDC through an automobile accessory plug-in (24 VDC and 12 VDC plug-ins are not included with either dedicated MAFFS Base Station). A headset for the TAF-550 is included for noisy environments in addition to a handheld mic.

MAFFS kits also include ten (10) King 210 channel VHF-FM handheld radios, 4 Hi/Low impedance headsets and adapters. The spare base station will not be issued with portable radios, headsets, or adapters.

GENERAL COMMUNICATIONS CONDITIONS & SOLUTIONS

General Communications Conditions & Solutions 26

Drawing #:

(1) Command/Tac Radio Kit and Command Repeater/Link 28

(2) One-Hop Logistics Repeater with Logistics Radio Kit 29

(3) Command/Tac Radio Kit and Command Repeater/Link with Remote Kit 30

(4) Incident Operations Area to ICP/ICC Backbone 31

(5) Large Incident Operations Area Linking System 32

(6) Extended or Multiple Incident Operations Area Linking System 33

(7) Extended Incident Operations Area Linking System 34

(8) Extended or Multiple Incident Operations Area Linking System 35

GENERAL COMMUNICATIONS CONDITIONS & SOLUTIONS

CONDITIONS	EQUIPMENT SOLUTIONS	NFES#	DWG#
All incident area is not line-of-sight	**CMD/Tac Radio Kit** **CMD Repeater/Link** Use of a repeater generally allows more flexibility and gives wider coverage.	4381 4312 4330	1
Logistics points are not line-of-sight.	**Logistics Radio Kit** **Logistics Repeater Kit** **Remote Kit** To be used to tie logistics points together if not line-of-sight.	4244 4248 4330	2
ICP/ICC not in line-of-sight with incident CMD Repeater.	**CMD/TAC Radio Kit** **CMD Repeater/Link** **Remote Kit** Remote Kit will allow ICP/ICC radio to be installed at a location up to one mile away, where line-of-sight exists, but be controlled from the ICP/ICC through a desk set.	4381 4312 4330	3
Need to backbone CMD Repeater to reach the ICP/ICC due to terrain problems.	**CMD Repeater/Link** **Logistics Repeater** **Remote Kit** Logistics UHF and CMD VHF are not normally linked. However, terrain problems may dictate linking a CMD Repeater, via a UHF Link to a Logistics Repeater, for the incident operations area to reach the ICP/ICC.	4312 4248 4330	4
Need to link two ends of an incident which has considerable linear distance or terrain problems.	**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.	4312 4330	5
Need to link more than two CMD RPTs to cover large incident, multiple small incidents.	**Three or more CMD RPT/Links** **Remote Kit** UHF Links are on same simplex frequency which allows linking of all CMD RPTs. All UHF Links MUST be line-of-sight	4312 4330	6

with each other. Each CMD Repeater is on a different frequency. Call NIICD CDO for assistance.

GENERAL COMMUNICATIONS CONDITIONS & SOLUTIONS

CONDITIONS	EQUIPMENT SOLUTIONS	NFES#	DWG#
Need to link two ends of an incident over long distance OR neither CMD Repeater can reach the 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.	4312 4248 4330	7
Need to link more than two CMD RPTs. All UHF Links are not line-of-sight with each other. Used to link large incident or multiple small incidents.	**Three or more CMD RPT/Links** **Logistics Repeater** **Remote Kit** UHF Repeater is hub which links all CMD RPTs. All UHF links **MUST** be line-of-sight with the UHF RPT. ICC/ICP can be tied in through one of the CMD RPTs, or the UHF RPT. Each CMD RPT is on a different frequency. Call NIICD-CDO for assistance.	4312 4248 4330	8
New, growing incident needs communications.	**ICS Starter System:** Contains sufficient equipment to initially supply a new incident which has potential for increasing in size. System includes: CMD Repeater/Link CMD/ TAC Radio Kits (3 ea.) Ground A/C Radio/Link Kit Remote Kit (2 ea.) Satellite Iridium Phone kit (1ea. when available) Logistics Repeater Logistics Radio Kit (1 ea.)	4390	

COMMAND/TACTICAL RADIO KIT AND COMMAND REPEATER/LINK

EQUIPMENT NEEDED:

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

COMMAND REPEATER/LINK

INCIDENT OPERATIONS AREA

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

ICP/ICC OR OTHER INCIDENT OPERATIONS AREA

REMOTE KIT

DRAWING 1

ONE-HOP LOGISTICS REPEATER WITH LOGISTICS RADIO KIT

NOTE: SHOULD SPECIFY REPEATER FREQUENCIES WHEN ORDERING.

LOGISTICS REPEATER

EQUIPMENT NEEDED:

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

EXPANDED DISPATCH, SPIKE CAMPS, STAGING AREAS, ETC.

REMOTE KIT

REPEATER REQUIRED BECAUSE LINE-OF-SIGHT DOES NOT EXIST BETWEEN LOCATIONS.

ICP/ICC

REMOTE KIT

DRAWING 2

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

COMMAND REPEATER/LINK

EQUIPMENT NEEDED:

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

INCIDENT OPERATIONS AREA

REMOTE KIT
(INSTALLED LINE-OF-SIGHT TO REPEATER)

ICP/ICC

REMOTE UNIT REQUIRED WHEN NO LINE-OF-SIGHT EXISTS BETWEEN THE COMMAND REPEATER SITE AND THE ICP/ICC SITE.

DRAWING 3

INCIDENT OPERATIONS AREA TO ICP/ICC BACKBONE

EQUIPMENT NEEDED:

1 EA. 4248 LOGISTICS REPEATER
1 EA. 4312 COMMAND REPEATER/LINK
1 EA. 4330 REMOTE KIT

COMMAND REPEATER/LINK

LOGISTICS REPEATER

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.

REMOTE KIT

ICP/ICC

DRAWING 4

LARGE INCIDENT OPERATIONS AREA LINKING SYSTEM

COMMAND REPEATER/LINK

UHF

COMMAND REPEATER/LINK

EQUIPMENT NEEDED:

2 EA. 4312 COMMAND REPEATER/LINK
1 EA. 4330 REMOTE KIT

VHF

VHF

INCIDENT OPERATIONS AREA

ICP/ICC

REMOTE KIT

VHF

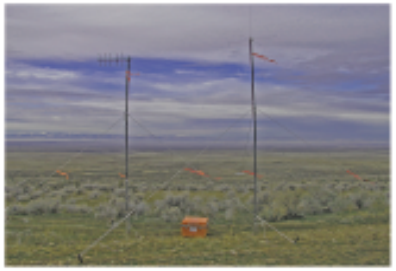
INCIDENT OPERATIONS AREA

A SYSTEM OF REPEATERS AND LINKS THAT EXTENDS COMMUNICATIONS COVERAGE FOR AN INCIDENT WHICH HAS A LARGE OPERATIONAL AREA. FREQUENCY COORDINATION WITH COMC OR CDO REQUIRED.

NOTE: THIS SYSTEM LINKS TWO (2) DIFFERENT COMMAND FREQUENCIES.

DRAWING 5

EXTENDED OR MULTIPLE INCIDENT OPERATIONS AREA LINKING SYSTEM



COMMAND REPEATER/LINK

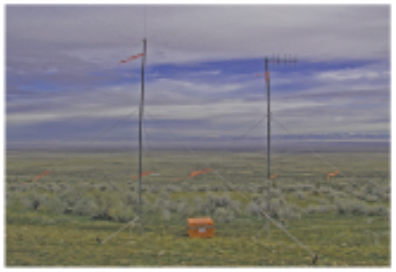
VHF

INCIDENT OPERATIONS AREA

EQUIPMENT NEEDED:

2 EA. 4312 COMMAND REPEATER/LINKS
1 EA. 4330 REMOTE KIT

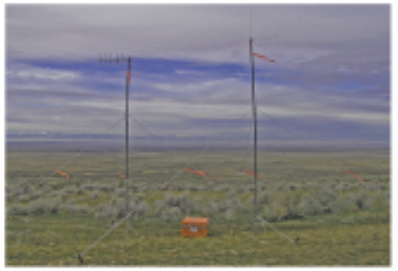
UHF



COMMAND REPEATER/LINK

UHF

UHF



VHF

INCIDENT OPERATIONS AREA

VHF

INCIDENT OPERATIONS AREA

A SERIES OF REPEATERS AND LINKS THAT EXTENDS COMMUNICATIONS COVERAGE FOR MULTIPLE SMALL INCIDENTS OR FOR AN INCIDENT WHICH HAS AN EXTENDED OPERATIONAL AREA. COMMUNICATIONS WITH THE ICP/ICC IS THROUGH ONE OF THE COMMAND REPEATERS. A SIMPLEX UHF FREQUENCY LINKS THE SYSTEM. ADDITIONAL REPEATERS AND LINKS CAN BE ADDED AS LONG AS THEY ARE LINE-OF-SIGHT WITH ALL OTHER UHF LINKS. FREQUENCY COORDINATION WITH COMC OR CDO IS REQUIRED.
NOTE: EACH COMMAND REPEATER IS A DIFFERENT FREQUENCY.

VHF

ICP/ICC

REMOTE KIT

DRAWING 6

EXTENDED INCIDENT OPERATIONS AREA LINKING SYSTEM

EQUIPMENT NEEDED:

2 EA. 4312 COMMAND REPEATER/LINK
1 EA. 4330 REMOTE KIT
1 EA. 4248 LOGISTICS REPEATER

COMMAND REPEATER/LINK

UHF

LOGISTICS REPEATER

UHF

COMMAND REPEATER/LINK

VHF

OR

UHF

VHF

REMOTE KIT

ICP/ICC

VHF

INCIDENT OPERATIONS AREA

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

NOTE: THIS SYSTEM LINKS TWO (2) DIFFERENT COMMAND FREQUENCIES AND ONE (1) LOGISTICS FREQUENCY.

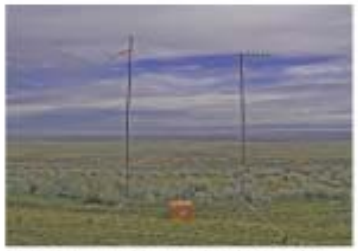
INCIDENT OPERATIONS AREA

DRAWING 7

EXTENDED OR MULTIPLE INCIDENT OPERATIONS AREA LINKING SYSTEM

EQUIPMENT NEEDED:

3 EA. 4312 COMMAND REPEATER/LINK
1 EA. 4330 REMOTE KIT
1 EA. 4248 LOGISTICS REPEATER



COMMAND REPEATER/LINK

UHF

LOGISTICS REPEATER

UHF

COMMAND REPEATER/LINK

UHF

COMMAND REPEATER/LINK

INCIDENT OPERATIONS AREA

UHF OR VHF

REMOTE KIT

ICP/ICC

VHF

INCIDENT OPERATIONS AREA

VHF

INCIDENT OPERATIONS AREA

A SERIES OF REPEATERS AND 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 REPEATERS AND LINKS CAN BE ADDED, AS LONG AS THEY ARE LINE-OF-SIGHT WITH THE LOGISTICS REPEATER. FREQUENCY COORDINATION WITH THE COMC OR CDO IS REQUIRED.
NOTE: EACH COMMAND REPEATER IS A DIFFERENT FREQUENCY.

DRAWING 8

AVIATION COMMUNICATIONS CONDITIONS & SOLUTIONS

Aircraft Equipment Conditions 37

Drawing #:

(9) Ground VHF-AM Base Station Kit 39

(9) Ground to Aircraft Radio/Link Kit (Used as Base Station) 39

(10) Ground to Aircraft Radio/Link Kit (Using Linking) 40

(11) Ground to Aircraft Radio/Link Kit (Extended Range with 2 Kits) 41

(12) Portable IR Data Downlink Kit 42

AIRCRAFT EQUIPMENT CONDITIONS

CONDITIONS	EQUIPMENT SOLUTION	NFES#	DWG#
Ground/Air for Forest Health Protection Projects Ground VHF-AM Base Station Kit	**Ground VHF-AM Base Station Kit** For Forest Health Protection projects and incidents needing VHF-AM base station capabilities. This kit includes four (4) ICOM handheld radios. VHF-AM frequency used in kit must be cleared/authorized.	4300	9
Need helibase/airport ground to aircraft communications (VHF-AM).	**Ground 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/NIRSC. All kits include four (4) programmable ICOM radios. (Kit is used as a base station, without the link, in this instance.)	4370	9
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 Aircraft Radio/Link Kit utilizing Link capability:** 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/NIRSC. A VHF radio can be substituted on the link side. Call NIICD-CDO for assistance.	4370	10

Each kit includes four (4) handheld programmable ICOM radios.

AIRCRAFT EQUIPMENT CONDITIONS

CONDITIONS	EQUIPMENT SOLUTION	NFES#	DWG#
Extensive flight-following needs require expansion of Radio/Link Kit system utilizing two (2) kits.	**Ground Aircraft Radio/Link Kit** By using two (2) Ground Aircraft Radio/Link Kits linked on a single UHF-AM frequency, flight-following capabilities can be greatly expanded. This design uses one (1) UHF-FM and two (2) VHF-AM frequencies. Helibase must flight-follow using the UHF-FM side of the system. Dedicated VHF-AM and UHF-FM frequencies must be ordered through Expanded Dispatch. A VHF radio can be substituted on the link side. Call NIICD-CDO for assistance and clearance of frequencies for assignment.	4370	11

Each kit includes four (4) handheld

GROUND VHF-AM BASE STATION KIT
&
GROUND TO AIRCRAFT RADIO/LINK KIT
(Used as a Base Station)

EXCLUSIVE INCIDENT FAA FREQUENCY SHOULD BE ORDERED THROUGH EXPANDED DISPATCH.

EQUIPMENT NEEDED:

1 EA. 4370 GROUND A/C RADIO/LINK KIT
(INCLUDES 4 EA. ICOM HANDHELDS)

OR

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

DRAWING 9

GROUND TO AIRCRAFT RADIO/LINK KIT
(Using Linking)

EXCLUSIVE INCIDENT FAA FREQUENCY SHOULD BE CLEARED/ORDERED THROUGH EXPANDED DISPATCH.

VHF-AM/UHF GRND A/C RADIO/LINK

EQUIPMENT NEEDED:

1 EA. 4370 GROUND A/C RADIO/LINK KIT
(INCLUDES 4 EA. ICOM HANDHELDS)
1 EA. 4330 REMOTE KIT

VHF-AM

UHF-FM

REMOTE KIT

HELIBASE

THIS SYSTEM EXTENDS FLIGHT FOLLOWING COVERAGE. KIT CAN ALSO BE OPERATED WITH A VHF-FM RADIO IN THE LINK PORTION OF THE KIT. CALL NIICD CDO FOR FREQUENCY ASSISTANCE.

DRAWING 10

GROUND TO AIRCRAFT RADIO/LINK KIT
(Extended Range with 2 Kits)

EXCLUSIVE INCIDENT FAA FREQUENCY
SHOULD BE CLEARED/ORDERED THROUGH
EXPANDED DISPATCH.

EQUIPMENT NEEDED:

2 EA. 4370 GROUND A/C RADIO/LINK KIT
(INCLUDES 4 EA. ICOM HANDHELDS)

VHF-AM/UHF GRND A/C RADIO/LINK

UHF-FM

VHF-AM/UHF GRND A/C RADIO/LINK

VHF-AM

VHF-AM

VHF-AM

HELISPOT
W/ICOM

USING TWO (2) A/C KITS LINKED TOGETHER BY UHF-FM ALLOWS FOR GREATER AREA COVERAGE FOR FLIGHT FOLLOWING. USES ONLY ONE (1) UHF-FM AND TWO (2) VHF-AM FREQUENCIES. CALL NIICD CDO FOR FREQUENCY ASSISTANCE.

DRAWING 11

HELIBASE
W/ICOM

PORTABLE IR DATA DOWNLINK KIT

ONLY A QUALIFIED IRIN MAY ORDER THIS EQUIPMENT.

EQUIPMENT NEEDED:

1 EA. 4800 IR DOWNLINK KIT

ICP/IRIN

THESE UNITS ARE USED TO TRANSFER DIGITAL INFRARED IMAGE DATA TO THE IRIN WHEN TIME IS CRITICAL, OR A NEARBY LANDING FIELD CAN NOT BE USED. IT ALLOWS FOR THE RAPID TRANSFER OF THE IMAGERY AS IT IS COLLECTED BETWEEN RUNS.

DRAWING 12

programmable ICOM radios.

KIT INVENTORIES

4244 Logistics Radio Kit 44
4248 Logistics Repeater Kit 45
4253 UHF Link 46
4281 Crossband Link Kit 47
4300 Ground VHF-AM Base Station Kit 48
4312 Command Repeater/Link 49
4330 Remote Kit 50
4370 Ground Aircraft Radio/Link Kit 51
4381 CMD/TAC Radio Kit 53
4390 ICS Starter System 55
4410 Public Address Kit 56
4499 Air Attack Kit 57

4630 Satellite Iridium Phone Kit 58
MAFFS Kit 59

NATIONAL INCIDENT RADIO SUPPORT CACHE

TOTAL WEIGHT	4244 LOGISTICS RADIO KIT	DIMENSIONS
BOX 75 LBS	CUFT 3.5	20 X 21 X 15"

(KING & MOTOROLA XTS-3000 UHF RADIOS)

(STANDARD-ALL KITS)

NFES#	DESCRIPTION	QTY ISSUED
4309	Box, fiberglass, (radio & rptr)	1 ea
4306	Liner, foam, radio kit	1 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
	E.F. JOHNSON	
	Radio, E.F. Johnson, 5100 (capitalized)	16 ea
	SUBKIT-4224	
0030	Batteries, AA	16 pg
4229	Antenna, uhf, E.F. Johnson	19 ea
4230	Holster, leather,, E.F. Johnson	16 ea
4231	Holder, battery, AA, E.F. Johnson	16 ea
4232	Speaker/mic, E.F. Johnson	16 ea
4355	Antenna, mobile mag, (bnc-w/sma adapter)	4 ea
4225	Cable, cloning, E.F. Johnson	1 ea
	KING	
	Radio, King, (capitalized)	16 ea
	SUBKIT-4246	
0030	Batteries, AA	12 pg
5340	Antenna, uhf, King	19 ea
5331	Case, radio, King	16 ea
1034	Holder, battery, AA, King	16 ea
5330	Speaker/mic, King	4 ea
4355	Antenna, mobile mag.	4 ea
5350	Antenna adapter, mobile mag, King	4 ea
5353	Guard, keyboard/faceplate, King	16 ea
	(MOTOROLA)	
	Radio, Motorola, Xts-3000(capitalized)	16 ea
	SUBKIT-4539	
0030	Batteries, AA	16 pg
4540	Antenna, uhf, Xts-3000	19 ea
4542	Holster, leather, Xts-3000	16 ea
4541	Holder, battery, AA, Xts-3000	16 ea

NATIONAL INCIDENT RADIO SUPPORT CACHE
4248 LOGISTICS REPEATER

	WEIGHT	CU FT	DIMENSIONS
TOTAL	95 LBS	4.5	
BOX	80 LBS	3.5	20"X21"X15”
MASTS	15 LBS	1.0	60"X3"X3"

NFES#	DESCRIPTION	QTY ISSUED
4309	Box, fiberglass, (radio & rptr)	1 ea
1023	Batteries, 7.5 Volt	4 ea
4297	Duplexer, Uhf	1 ea
0825	Tent stakes	3 ea
4171	Screwdriver, 6” straight slot	1 ea
4303	Hammer, 4 lb	1 ea
4304	Antenna, Uhf, whip, w/po-uhf load	1 ea
4489	Base antenna, Uhf w/gnd planes	1 ea
4308	Guy assembly, antenna	1 ea
4326	Cable, coaxial w/2 ea 4327 (pl-259)	1 ea
4339	Adapter, barrel connector	1 ea
4333	Wire assembly, fused	1 ea
4659	Microphone, Daniels	1 ea
4690	Screwdriver, Daniels	1 ea
4180	Connector, 90°, UHF	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
4305	Masts, antenna, 5 ft. sect.	3 ea
4650	Card, audio control	1 ea
4651	Subrack	1 ea
4652	System monitor	1 ea
4677	Cable, uhf duplexer to radio	2 ea
4682	Transmitter, uhf, digital	1 ea
4683	Receiver, uhf, digital	1 ea

NATIONAL INCIDENT RADIO SUPPORT CACHE
4253 UHF LINK KIT

	WEIGHT	CU FT	DIMENSIONS
TOTAL	95 LBS	4.5	
BOX	80 LBS	3.5	20"X21"X15"
MASTS	15 LBS	1.0	60"X3"X3"

NFES#	DESCRIPTION	QTY ISSUED
4309	Box, fiberglass, (radio & rptr)	1 ea
4310	Liner, foam, 2-pocket	1 ea
1023	Battery, 7.5 volt	4 ea
0825	Tent stakes	3 ea
4303	Hammer, 4 lb	1 ea
4171	Screwdriver, 6” straight slot	1 ea
4308	Guy assembly, antenna	1 ea
4326	Cable, coaxial, w/2 ea 4327 (pl-259)	1 ea
4180	Connector, 90 degree, uhf	1 ea
4339	Adapter, barrel connector	1 ea
4304	Antenna, uhf whip, with PO-UHF load	1 ea
4489	Base antenna, uhf w/gnd planes	1 ea
4690	Screwdriver, Daniels	1 ea
5208	Antenna, yagi, w/u-bolt, clamp, nuts	1 ea
	Battery straps, 15-volt	3 ea
	Allen wrench	1 ea
	Battery jumpers, 4-red, 4-black	8 ea
	Battery jumpers, 6-foot, 1-red, 1-black	2 ea
	Fuses, 3AG, 5 amp	1 bx
	Lead box seal	2 ea
	Garbage bag	1 ea
	Switch setting diagram (laminated)	1 ea
	Kit inventory worksheets	3 ea
	Battery & antenna set-up sheets w/instructions	3 ea
	Frequency sheets	3 ea
	Filament tape	1 ro
	Flagging tape	1 ro
4305	Masts, antenna, 5 ft section	3 ea
4678	Cable, co-ax, transmitter to monitor	1 ea
4679	Cable, co-ax, receiver to monitor	1 ea
4682	Transmitter,uhf, digital	1 ea
4683	Receiver, uhf, digital	1 ea

NATIONAL INCIDENT RADIO SUPPORT CACHE
4281 CROSSBAND LINK

	WEIGHT	CU FT	DIMENSIONS
TOTAL	95 LBS	4.5	
BOX	80 LBS	3.5	20"X21"X15"
MASTS	15 LBS	1.0	60"X3"X3"

NFES#	DESCRIPTION	QTY ISSUED
4309	Box, fiberglass, (radio & rptr)	1 ea
1023	Batteries, 7.5 Volt	4 ea
0825	Tent stakes	6 ea
4171	Screwdriver, 6” straight slot	1 ea
4303	Hammer, 4 lb	1 ea
4464	Antenna, vhf whip, with PO-150 load	1 ea
4304	Antenna, uhf whip, with PO-Uhf load	1 ea
4489	Base antenna, vhf w/gnd planes	1 ea
4489	Base antenna, uhf w/gnd planes	1 ea
4308	Guy assembly, antenna	2 ea
4326	Cable, coaxial w/2 ea 4327 (pl-259)	2 ea
4339	Adapter, barrel connector	2 ea
4333	Wire assembly, fused	1 ea
4180	Connector, 90 degree, uhf	2 ea
4659	Microphone, Daniels	1 ea
4690	Screwdriver, Daniels	1 ea
5208	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
	Battery jumpers, 6-foot, 1-red, 1-black	2 ea
	Garbage bag	1 ea
	Filament tape	1 ro
	Flagging tape	1 ro
	Allen wrench	1 ea
	Kit inventory worksheets	3 ea
	Frequency sheets	3 ea
	Battery & antenna set-up sheets	3 ea
4651	Sub-rack, Daniels(19”)	1 ea
4684	Transmitter, vhf, digital	1 ea
4685	Receiver, vhf, digital	1 ea
4682	Transmitter, uhf, digital	1 ea
4683	Receiver, uhf, digital	1 ea
4668	Cable, receiver, A-side	1 ea
4669	Cable, transmitter, A-side	1 ea
4678	Cable, receiver, B-side Tx	1 ea

NATIONAL INCIDENT RADIO SUPPORT CACHE
4300 GROUND VHF-BASE STATION

	WEIGHT	CU FT	DIMENSIONS
TOTAL	95 LBS	4.5	
BOX	80 LBS	3.5	20”X21”X15”
MASTS	15 LBS	1.0	60”X3”X3”

NEFS#	DESCRIPTION	QTY ISSUED
4309	Box, fiberglass, (radio & rptr)	1 ea
4307	Liner, a/c 5-pocket	1 ea
1023	Battery, 7.5 volt	4 ea
0825	Tent stakes	3 ea
4303	Hammer, 4 lb	1 ea
4171	Screwdriver, 6” straight slot	1 ea
4308	Guy assembly, antenna	1 ea
4326	Cable, coaxial, w/2 ea 4327 (pl-259)	1 ea
0332	Wrench, adjustable, 6”	1 ea
4343	Antenna, vhf- am, AV-1	1 ea
4339	Adapter, barrel connector	2 ea
	N. male to uhf female adapter (rfn-1035-1)	1 ea
	120 volt ac power cord (TBS-150)	1 ea
	Adapter, car battery, female to battery connector	1 ea
	Adapter, car battery, male to 2 hole (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
5066	Mic. (Telex) w/three pin male connector	1 ea
0030	Battery, AA	4 pg
5083	Holder, battery, AA, Icom	4 ea
5084	Case, radio, Icom	4 ea
5082	Antenna, Icom, handheld, helical	5 ea

NATIONAL INCIDENT RADIO SUPPORT CACHE
4312 COMMAND REPEATER/LINK

	WEIGHT	CU FT	DIMENSIONS
TOTAL	135 LBS	5.5	
BOX	105 LBS	3.5	20”X21”X15”
MASTS	30 LBS	2.0	60”X3”X3”

4309	Box, fiberglass, (radio & rptr)	1 ea	
1023	Batteries, 7.5 Volt	4 ea	
4342	Duplexer, vhf	1 ea	
0825	Tent stakes	6 ea	
4171	Screwdriver, 6” straight slot	1 ea	
4303	Hammer, 4 lb	1 ea	
4464	Antenna, vhf whip, with PO-150 load	1 ea	
4304	Antenna, uhf whip, with PO-UHF load	1 ea	
4489	Base antenna, w/grnd planes(1-vhf 1-uhf)	2 ea	
4308	Guy assembly, antenna	2 ea	
4326	Cable, coaxial w/2 ea 4327 (pl-259)	2 ea	
4339	Adapter, barrel connector	2 ea	
4333	Wire assembly, fused	1 ea	
4659	Microphone, Daniels	1 ea	
4690	Screwdriver, Daniels	1 ea	
4180	Connector, 90 degree, Uhf	2 ea	
5208	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	
	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	
	User’s guide	1 ea	
	Lead box seal	2 ea	
4305	Masts, antenna, 5 ft. section	6 ea	
4650	Card, audio control	1 ea	
4651	Subrack	1 ea	
4652	System monitor	1 ea	
4676	Cable, vhf duplexer to radio	2 ea	
4678	Cable, uhf transmitter to monitor	1 ea	
4679	Cable, uhf receiver to monitor	1 ea	

	WEIGHT	CU FT	DIMENSIONS
TOTAL	105 LBS	4.5	
BOX	95 LBS	3.5	20”X21”X15”
MASTS	15 LBS	1.0	60”X3”X3”

NATIONAL INCIDENT RADIO SUPPORT CACHE

4330 REMOTE KIT

NFES#	DESCRIPTION	QTY ISSUED
4309	Box, fiberglass (radio & rptr)	1 ea
4473	Desk set, CPI, Mod. DR-10	1 ea
1023	Battery, 7.5 volt	2 ea
1233	Battery, 6 volt hotshot	2 ea
4332	Wire, field telephone, ¼ mile reel	1 ro
0825	Tent stakes	3 ea
4171	Screwdriver, 6” straight slot	1 ea
4303	Hammer, 4 lb	1 ea
4464	Antenna, vhf whip w / po-150 load	1 ea
4304	Antenna, uhf whip w/ po-uhf load	1 ea
4489	Base antenna, w/ grnd planes - vhf	1 ea
4489	Base antenna, w/ grnd planes - uhf	1 ea
5208	Antenna, yagi, w/u-bolt, clamp, nuts	1 ea
4308	Guy assembly, antenna	1 ea
4326	Cable, coaxial w/ 2 ea 4327 (PL-259)	1 ea
4339	Adapter, barrel connector	1 ea
0325	Pliers, lineman	1 ea
4180	Connector, 90 degree, uhf	1 ea
4302	Wire assembly, fused, dc/1 amp 3-hole	1 ea
4274	Ac/dc transformer	1 ea
4409	Speaker, external, 8-ohm	1 ea
	External power cord w/2- prong plug/dc	1 ea
	Kit inventory worksheets	3 ea
	Battery & antenna set-up sheets w/instructions	3 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
	Battery jumpers, 3 Red, 3 Black	6 ea
	Filament tape	1 ro
	Flagging tape	1 ro
4305	Masts, antenna, 5 ft section	3 ea
4471	Gray box for remote chassis	1 ea
5327	Battery eliminator, King	1 ea
5342	Panel, termination	1 ea
5326	Cable / connector assy, King	1 ea
5338	Box, aluminum – (5 ¾ x 3 ¾ x 2)	1 ea

NATIONAL INCIDENT RADIO SUPPORT CACHE

4370 GROUND AIRCRAFT RADIO/LINK KIT

	WEIGHT	CU FT	DIMENSION
TOTAL	110 LBS	4.5	
BOX	95 LBS	3.5	20”X21”X15”
MASTS	15 LBS	1.0	60”X3”X3”

NFES#	DESCRIPTION	QTY ISSUED
4309	Box, fiberglass, (radio & rptr)	1 ea
4307	Liner, foam 5 pocket	1 ea
1023	Battery, 7.5 volt	4 ea
0825	Tent stakes	6 ea
4659	Microphone, Daniels	1 ea
4303	Hammer, 4 lb	1 ea
4343	Antenna, vhf/am, AV-1	1 ea
4489	Base antenna, uhf w/gnd planes	1 ea
4308	Guy assembly, antenna	2 ea
4326	Cable, coaxial w/2 ea 4327 (pl-259)	2 ea
4339	Adapter, barrel connector	2 ea
4180	Connector, 90 degree, uhf	2 ea
4304	Antenna, uhf whip, with Po-Uhf load	1 ea
4409	Speaker, external, 8-ohm	1 ea
4171	Screwdriver, 6” straight slot	1 ea
4690	Screwdriver, Daniels	1 ea
0332	Wrench, adjustable, 6”	1 ea
0030	Battery, AA	4 pg
5082	Antenna, Icom	5 ea
5083	Holder, battery, AA, Icom	4 ea
5084	Holster, radio, Icom	4 ea
4651	Sub-rack, with motherboard, SR39-1	1 ea
4682	Transmitter, uhf, digital	1 ea
4683	Receiver, uhf, digital	1 ea
4665	Monitor, system	1 ea
4666	Transmitter, syn. Vhf-Am	1 ea
4667	Receiver, syn. Vhf-Am	1 ea
4668	Cable, receiver, A-side	1 ea
4669	Cable, transmitter, A-side	1 ea
4678	Cable, co-ax, B-side transmit	1 ea
4679	Cable, co-ax, B-side receive	1 ea
4675	Card, control, audio(AC-3E)	1 ea

NATIONAL INCIDENT RADIO SUPPORT CACHE
4370 GROUND AIRCRAFT RADIO/LINK KIT
CONTINUED

NFES#	DESCRIPTION	QTY ISSUED
	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
	Filament tape	1 ro
	Flagging tape	1 ro
	Allen wrench	1 ea
	Lead box seal	2 ea
	Garbage bag	1 ea
	Operating booklet, Icom	1 ea
	Frequency sheet for Icoms	4 ea
	Frequency sheet, uhf	3 ea
	Battery & antenna set-up sheets	3 ea
	Kit inventory worksheet	3 ea
	T-card, radio tracking	8 ea
	Installation Instruction sheet	3 ea
4305	Masts, antenna, 5 ft. section	6 ea

	WEIGHT	CU FT	DIMENSION
TOTAL	85 LBS	3.5	20”X21”X15”

NATIONAL INCIDENT RADIO SUPPORT CACHE
(STANDARD ALL KITS)
4381 CMD/TAC RADIO KIT (KING, RACAL, MOTOROLA, E. F. JOHNSON)

NFES#	DESCRIPTION	QTY ISSUED
4309	Box, fiberglass, (radio & rptr)	1 ea
4306	Liner, foam, radio kit	1 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
	E.F. JOHNSON	
	Radio, E.F. Johnson, 5100(capitalized)	16 ea
	SUBKIT-4351	
0030	Batteries, AA	16 pg
4163	Antenna, Vhf, E.F. Johnson	19 ea
4230	Holster, leather, E.F. Johnson	16 ea
4231	Holder, battery, AA, E.F. Johnson	16 ea
4232	Speaker/mic, E.F. Johnson	16 ea
4355	Antenna, mobile mag, (bnc-w/sma adapter)	4 ea
4225	Cable, cloning, E.F. Johnson	1 ea
	KING	
	Radio, King, EPH(capitalized)	16 ea
	SUBKIT-4353	
0030	Batteries, AA	12 pg
5321	Antenna, Vhf, King	19 ea
5331	Case, radio, King	16 ea
1034	Holder, battery, AA, King	16 ea
5330	Speaker/mic, King	4 ea
4355	Antenna, mobile mag.	4 ea
5350	Antenna adapter, mobile mag, King	4 ea
5353	Guard, keyboard/faceplate, King	16 ea
	RACAL/THALES	
	Radio, Racal/Thales, PRC6894(capitalized)	16 ea
	SUBKIT-4162	
0030	Batteries, AA	14 pg
4163	Antenna, Vhf, Racal/Thales	19 ea
4164	Holster, leather, Racal/Thales	16 ea
4165	Holder, battery, AA, Racal/Thales	16 ea
4166	Speaker/mic, Racal/Thales	16 ea
4355	Antenna, mobile mag, (bnc-w/sma adapter)	4 ea

NATIONAL INCIDENT RADIO SUPPORT CACHE
4381 CMD/TAC RADIO KIT (KING, RACAL, MOTOROLA, E.F. JOHNSON)
(CONTINUED)

	KING DIGITAL		
4603	Radio, King, (capitalized) DPHx	16 ea	
	SUBKIT-4600		
0030	Batteries, AA	12 pg	
4601	Antenna, Vhf, King, Digital	19 ea	
5331	Case, radio, King	16 ea	
1034	Holder, battery, AA, King	16 ea	
5330	Speaker/mic, King	4 ea	
4355	Antenna, mobile mag.	4 ea	
5350	Antenna adapter, mobile mag, King	4 ea	
5353	Guard, keyboard/faceplate, King	16 ea	
4602	Cloning Cable, King DPHx	1 ea	

	DATRON		
4115	Radio, Datron G25RPV100(capitalized)	16 ea	
	SUBKIT-4110		
0030	Batteries, AA	16 pg	
4111	Antenna, Vhf, Datron	19 ea	
4112	Holster, leather, Datron	16 ea	
4541	Holder, battery, AA (Mot Xts & Datron)	16 ea	
4113	Speaker/mic, Datron	4 ea	
4114	Cable, cloning, Datron	1 ea	
4355	Antenna, Mobile Mag, (bnc-w/sma adapter)	4 ea	

NATIONAL INCIDENT RADIO SUPPORT CACHE
4390 ICS STARTER SYSTEM (COMMAND/LOGISTICS)

	WEIGHT	CU FT	DIMENSIONS
TOTAL	1035 LBS	42.0	
BOX	915 LBS	35.0	10 EA @ 20"X21"X15"
MASTS	120 LBS	8.0	8 EA @ 60"X3"X3"

NFES#	DESCRIPTION	QTY ISSUED
4244	Logistics Radio Kit	1 ea
4248	Logistics Repeater	1 ea
4305	Masts, Antenna 5 Ft Sections	24 ea
4312	Command Repeater/Link	1 ea
4330	Remote Kit	2 ea
4370	Ground Aircraft Radio/Link Kit	1 ea
4381	Cmd/Tac Radio Kit	3 ea
4630	Satellite Remote Kit	1 ea

NATIONAL INCIDENT RADIO SUPPORT CACHE
4410 PUBLIC ADDRESS SYSTEM

TOTAL	WEIGHT	CU FT	DIMENSIONS
BOX	60 LBS	3.5	20”X21”X15”

NFES#	DESCRIPTION	OTY ISSUED
4309	Box, Fiberglass	1 ea
1233	Batteries, 6 Volt Hot Shot	2 ea
4377	Wire, 1,000 Ft. Roll	1 ro
5037	Microphone, Pa	1 ea
4171	Screwdriver, 6” Straight Slot	1 ea
0325	Pliers, Lineman	1 ea
1172	100’ Extension Cord	1 ea
4397	Amplifier, Pa	1 ea
4063	Speaker, 8 Ohm, 15 Watt, Pa	3 ea
	Garbage Bag	1 ea
	Filament Tape	1 ea
	Flagging Tape	1 ea
	Fuses, 3Ag 1 Amp	1 bx
	Wirenuts, Small	10 ea
	Battery Jumpers, 3 Black, 3 Red	6 ea
	Kit Inventory Worksheets	3 ea
	Lead Box Seal	2 ea
	Installation Instructions	3 ea

NATIONAL INCIDENT RADIO SUPPORT CACHE
4499 AIR ATTACK KIT

TOTAL	WEIGHT	CU FT	DIMENSIONS
BOX	35 LBS	3.35	24.5”X14”X17”

NFES#	DESCRIPTION	QTY ISSUED
0529	Carton, Fiberboard	1 ea
4479	Chassis, Air Attack (Model TAK 100)	1 ea
4487	Cable, Power	1 ea
4488	Cable, Audio/Mic	1 ea
4500	Adapter, Headset	2 ea
4486	Adapter, PTT, PT-300	2 ea
	Connector, Barrel, Bnc	2 ea
	Operator’s Guide TFM-138B or TDFM-136	1 ea
4490	Strap, Tie Down	2 ea
	Information Sheet, Air Attack	1 ea
	Information Sheet for TFM-138 or TDFM-136	1 ea

NATIONAL INCIDENT RADIO SUPPORT CACHE
4630 SATELLITE IRIDIUM PHONE KIT

	WEIGHT	CU FT	DIMENSIONS
TOTAL	90 LBS	4.5	
BOX	75 LBS	3.5	20”X21”X15”
MASTS	15 LBS	1.0	60”X3”X3”

NFES#	DESCRIPTION	QTY ISSUED
4309	Box, fiberglass,(large)	1 ea
4609	Phone box, fiberglass (small)	1 ea
0825	Tent stakes	3 ea
4303	Hammer,4 lb	1 ea
4308	Guy assembly, antenna	1 ea
1023	Battery, 7.5 volt	4 ea
	Adapter, female cig. lighter to battery connectors	1 ea
	Adapter, female cig. lighter to alligator clamps	1 ea
	Filament tape	1 ro
	Flagging tape	1 ro
	Garbage bag	1 ea
	Battery jumpers (3 red – 3 black)	6 ea
	Spare fuse, 3 amp/3agc (in batt.tray of dock.station)	1 ea
	Battery straps 15 volt	3 ea
	Battery & antenna set-up sheets	3 ea
	Calling instructions	1 ea
	Kit inventory worksheets	3 ea
	Iridium phone user guide	1 ea
	Lead box seals	2 ea
4612	Antenna, mobile mag	1 ea
4623	A/C charger to docking station	1 ea
4617	Docking station	1 ea
4618	D/C power adapter/ docking station to auto	1 ea
4619	Antenna, fixed mast	1 ea
4620	Cable, docking station to antenna(w/2 short cables)	1 ea
4621	Adapter, phone to dock	1 ea
4622	Handset, w / phone cord & RJ45 plug	1 ea
4305	Masts, antenna, 5 ft. section	3 ea

NATIONAL INCIDENT RADIO SUPPORT CACHE
MAFFS BASE STATION (TAF-550)

TOTAL	WEIGHT	CU FT	DIMENSIONS
BOX 1	35 LBS	3.35	24.5"X14"X17"
BOX 2	35 LBS	3.35	24.5"X14"X17"

NFES#	DESCRIPTION	QTY ISSUED
	Box 1	
4309	Box, Fiberglass	1 ea
0825	Tent Stakes	6 ea
4303	Hammer, 4 Lb.	1 ea
4308	Guy Assembly, Antenna	2 ea
4464	Antenna, Vhf Whip, W/Po-150 Load	1 ea
4489	Base Antenna,Vhf W/ Grnd Planes	1 ea
4343	Antenna,Vhf/AM, AV-1	1 ea
4326	Cable,Coaxial, w/2 ea 4327 (pl-259)	4 ea
4339	Adapter, Barrel Connector	3 ea
	Adapter, Bnc To Uhf	2 ea
	Headset, S-40	1 ea
	Information Sheet, TFM-138B Radio	1 ea
	Information Packet, TIL-91DE Radio	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
	115V power cable(in rear of Taf-550)	1 ea
	Microphone, Handheld (In rear of TAF-550)	1 ea
	Box 2	
4309	Box, fiberglass	1 ea
4322	Radio, King, EPH	10 ea
1034	Battery Holder, AA King	10 ea
0030	Battery, AA	8 pg
5321	Antenna, Helical King	11 ea
5331	Case, Radio King	10 ea
5328	Adapter, Helmet	6 ea
5330	Spkr Mic, King	4 ea
	Headset, David Clark H10-66	4 ea
	Adapter, Sigtronics #900051	2 ea
1086	Harness, Chest Radio	4 ea
	Earpiece, Radio	6 ea
	Pads, Alcohol	12 ea
	T-Cards, Radio Tracking	25 ea

KIT INSTALLATION INSTRUCTIONS

4248/ 4312	Setup Procedure NIRSC Stand-Alone Repeater	61
4248/ 4312	Command/Logistics Repeater Installation Instructions	62
4312	Setup Procedures NIRSC Repeater/Link Configuration	63
4312	Command Repeater/Link Installation Instructions	64
1023	+15 Volt Dual Battery Set Configuration	65
4253	UHF Link	66
4300	Ground VHF-AM Base Station Kit	67
4330	Remote Kit	69
4370	Ground A/C Radio/Link Kit Base Station Only	72
4370	Ground A/C Radio/Link Link Configuration	75
4410	Public Address Kit	79
4499	Air Attack Kit	81
4630	Satellite Iridium Phone Kit	85
	MAFFS Kit	88
	Radio System Diagrams	90

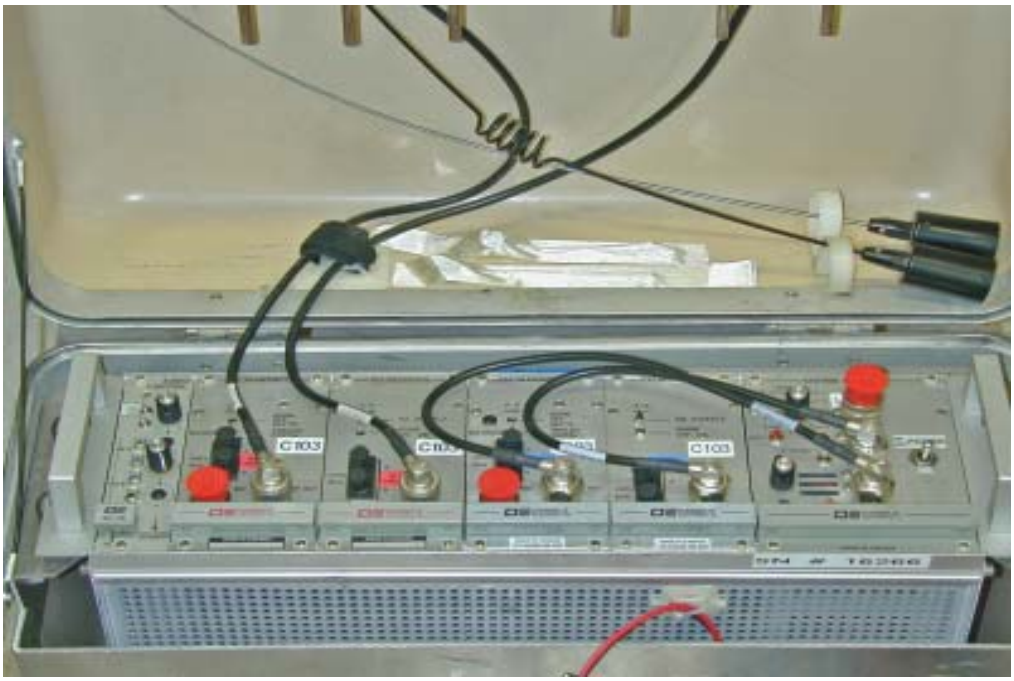
SET-UP PROCEDURES NIRSC STAND ALONE REPEATERS
NFES 4312 & 4248

1. Battery Supply. The battery is configured with a POLARIZED interconnect plug. If it becomes necessary to replace batteries, follow the battery hook-up illustration on page 62. Reversing polarity will result in an inoperative repeater. The repeater kit is shipped with the polarized plug disconnected and should be plugged in before the repeater is turned on.

2. Antenna Installation. Use the high gain antenna provided. Attach the ground planes.

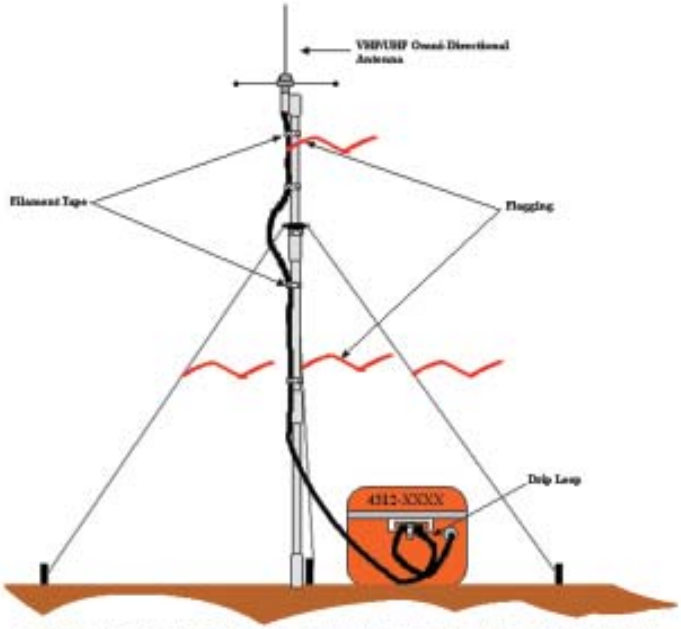
3. Coaxial Cable. DO NOT leave the cable coiled. Run the coaxial cable through the hole provided in the side of the shipping container. Close the lid tightly to prevent weather and rodent damage to the equipment. Put tape over the hole in the box where the coax comes through to prevent rain from entering the box.

Note: Verify that the UHF Modules are in the "OFF" position when used as a stand alone command repeater.

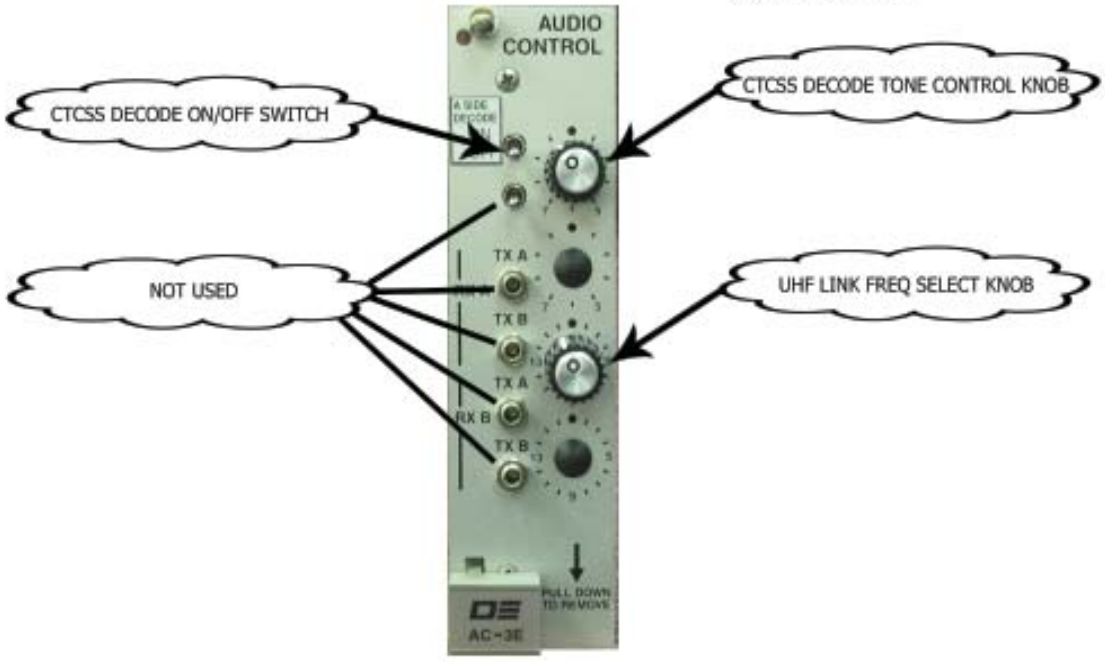


COMMAND/LOGISTICS REPEATER
NFES 4312 & NFES 4248
STAND-ALONE INSTALLATION INSTRUCTIONS

15 VOLT BATTERY CONFIGURATION



REPEATER (4312 & 4248) ANTENNA SETUP IN STAND-ALONE CONFIGURATION



A COMMAND REPEATER/LINK AUDIO CONTROL CARD

SET-UP PROCEDURES NIRSC REPEATER/LINK CONFIGURATION
INSTALLATION INSTRUCTIONS

VHF REPEATERS ARE SENT OUT WITH UHF LINK RADIOS (Modules) INSTALLED.
NOTE: A CONFIGURATION DIAGRAM IS PROVIDED WITH EACH UNIT.

1. Erect the UHF Link Antenna (Yagi or Omni) according to the drawing. Attach the coaxial cable through the hole provided in the side of the fiberglass box to the Antenna Link port on the system monitor, using a 90 degree UHF connector (NFES# 4180) at the port.

2. The antenna coax should be fed out of the repeater box through the appropriate port. If done properly, the repater and link coax's will exit on opposite sides of the repater box. The repeater box access ports are marked to facilitate proper installtion. DO NOT FEED BOTH THE REPEATER AND LINK COAXS' OUT OF THE SAME ACCESS PORT!

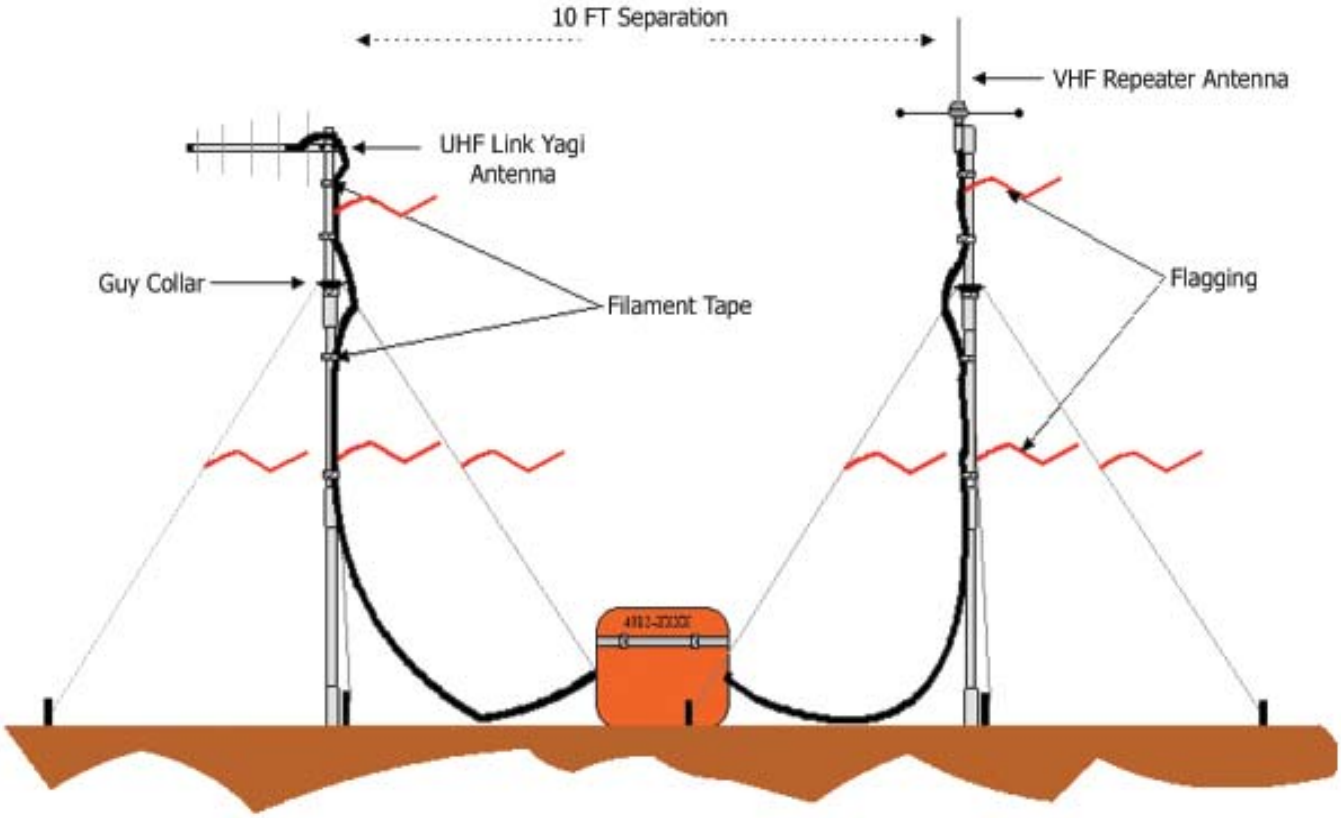
3. Ensure that the UHF TRANSMITTER AND RECEIVER Module switches are in the correct, "NORM", position.

4. Unless special frequencies are required, the UHF TX and RX frequencies are set by selecting the proper channel number using the TX B and RX B channel Select Switch on the AUDIO CONTROL Module. The Channel Select Switch is the bottom switch on the AUDIO CONTROL Module. The switch changes BOTH the transmit and receive frequencies at the same time. SEE THE CHANNEL/FREQUENCY CHART PROVIDED. "Straight UP" is Channel 1.

5. After installation is complete, test the repeater and link modules using the appropriate portable radios before leaving the site. NOTE: BACK AWAY FROM THE REPEATER/LINK BOX A MINIMUM OF 25 FEET BEFORE TESTING.

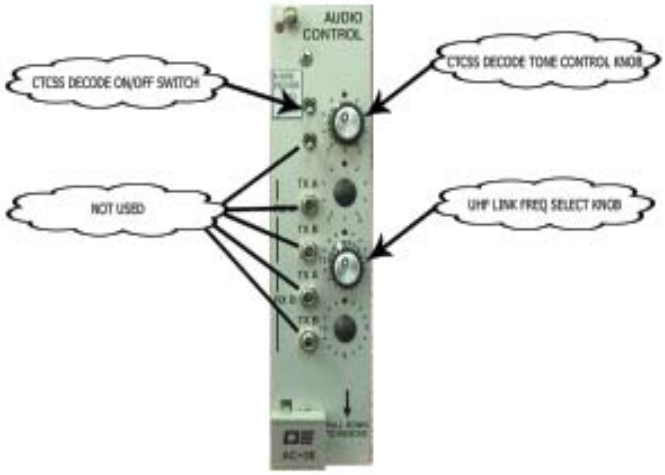
6. If a[illegible] mber (208) 387-5644.

COMMAND REPEATER/LINK
NFES 4312
LINK CONFIGURATION INSTALLATION INSTRUCTIONS



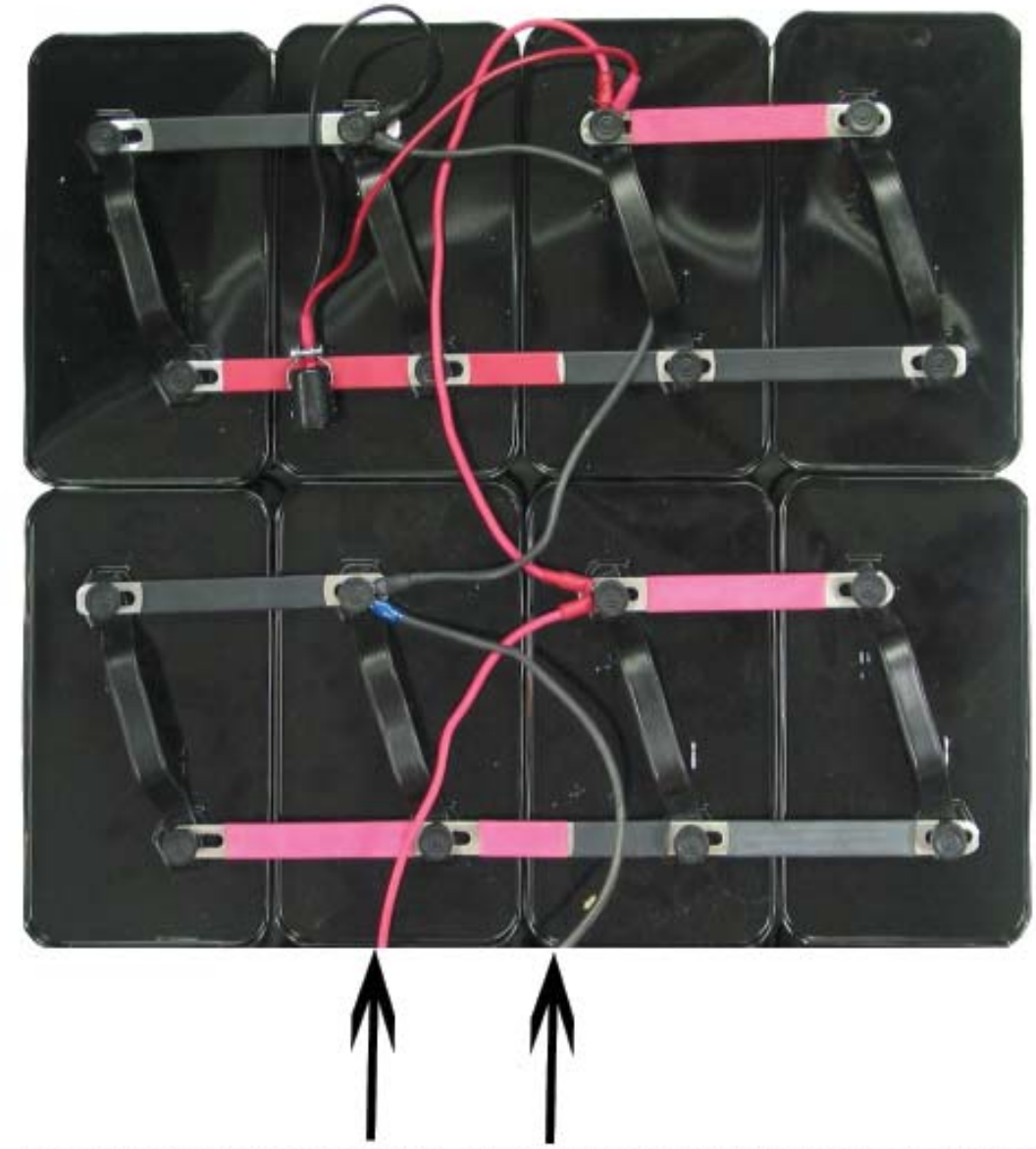
REPEATER (4312) ANTENNA SETUP IN LINK CONFIGURATION

15 VOLT BATTERY CONFIGURATION



COMMAND REPEATER/LINK CONTROL CARD

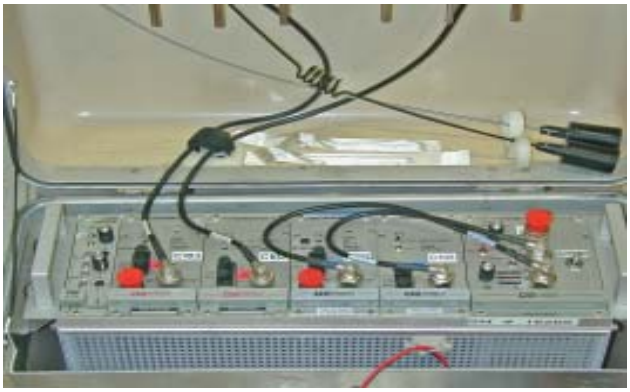
+15 VOLT DUAL BATTERY SET CONFIGURATION
NFES 1023

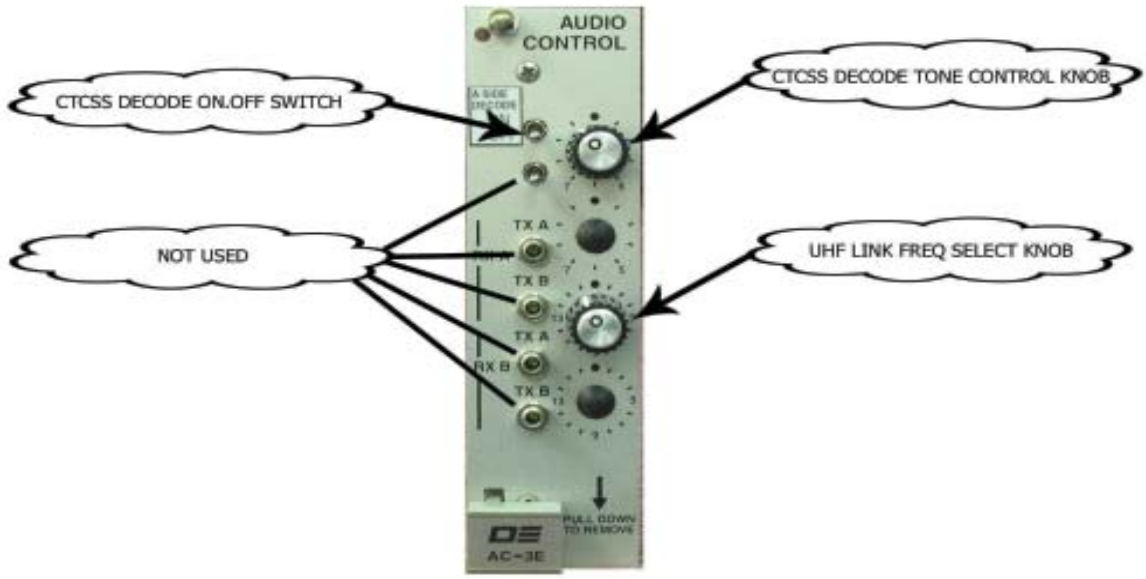


15 VOLT SERIES/PARALLEL CONFIGURATION
USES TWO (2) SETS OF 7.5 VOLT BATTERIES
NFES # 1023

ADDITIONAL SETS OF 4 EA. NFES#1023 MAY BE INTRODUCED AT THIS LOCATION. ALTHOUGH, IT IS RECOMMENDED THAT AT THIS POINT A DEEP CYCLE RV/MARINE BATTERY AND CHARGER BE PURCHASED AND UTILIZED.

UHF LINK
NFES 4253





A COMMAND REPEATER AUDIO CONTROL CARD

GROUND VHF-AM BASE STATION KIT
NFES 4300

ANTENNA SETUP: Connect one end of antenna cable to the base station antenna. Erect base station antenna and mast using guy ropes and stakes. Connect the other end of antenna cable to TBS-150 Ground VHF-AM Base Station.

VOLTAGE SELECTION: The TBS-150 can operate on 115 Vac or external 13 VDC power. **NEVER CONNECT BOTH 115 Vac and 13 VDC at the same time.**

For 115 Vac operation: Connect AC power cord into TBS-150 and 115 Vac outlet. Turn TBS-150 AC On/Off switch to ON. Turn 91-DE Power On/Off switch to On.

For external power/cigarette lighter operation: Connect 3 pin/cigarette lighter DC power cable into TBS-150 and supplied batteries or cigarette lighter. Turn 91-DE Power On/Off switch to On. Note: The TBS-150 AC On/Off switch only operates when 115 VAC is used.

MICROPHONE CONNECTION: Connect handmic's 3 pin connector to 91-DE MIC connector. PTT operation is from the handmic. **DO NOT transmit without the antenna connected**.

91-DE RADIO USE: 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 squelch knob until squelch just quiets. See enclosed Operating Instructions book for more information.

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

This kit is designed for base station use only and will not be operated in an aircraft.

GROUND VHF-AM BASE STATION KIT NFES 4300

REMOTE KIT
NFES 4330

This Kit consists of one box plus the antenna poles.

1. Remove the remote desk set from the box along with 2 ea. 6 volt Hotshot batteries. If AC power is not available, connect the batteries to the remote desk set using the provided wire assembly **(Fused DC 5 Amp, 3-prong cable)**. If AC power is available, use the provided AC-DC transformer to power the remote desk set. Connect the external speaker to the side audio jack for better audio quality.
CAUTION: Observe correct polarity when using batteries. See drawing for correct battery strapping (CPI remote desk set uses + 12 volts).

2. Remove the gray chassis box. Select a location common to the desired service areas that is within range of available communications wire supplied in the kit **(1/4 mile reels)**.
3. Erect the appropriate antenna (UHF, VHF, UHF Yagi) and attach the coax cable from the antenna to the coax connector on the outside of the gray chassis box.
4. Connect the remote end of the communications wire pair to the remote chassis terminal lugs on the outside of the gray chassis box **(not polarity dependent)**.
5. Open the grey box and determine if the correct radio is pre-mounted, if not connect the King adapter cable to the correct King radio's side connector (UHF or VHF), and strap it into place on top of the black DC termination panel. Connect the male BNC side of the King adapter cable to the female BNC side mount, and connect the male MIL Spec to the corresponding female side mount.
6. Connect power to the remote chassis by the provided 7.5 volt batteries or an external battery source. **Note: a fused DC 5 Amp, 2 prong cable is provided for external power.**
CAUTION: +10.5 to +15 volts is required for King radios.
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 top of the radio, and adjust the squelch.
8. String the communications wire back to the site of the remote desk set. Attach the wires directly to the binding posts on the back of the CPI remote desk set (**not polarity dependent**)
9. Test and verify operation of the remote.

REMOTE KIT
NFES 4330

REMOTE KIT
NFES 4330
Deskset Battery Setup

+12 Volt Output between red and black leads

GROUND AIRCRAFT RADIO/LINK KIT
NFES 4370

BASE STATION ONLY INSTALLATION

1. Erect the AV-1 aircraft antenna, according to the drawing. Attach the coaxial cable through the hole provided in the left side of the fiberglass kit box to the Antenna A, AM port on the system monitor, using a 90° UHF connector (NFES# 4180) at the port.

2. Connect the battery leads as shown in the drawing. There are several power supply options available (12-15 Volts) and the corresponding cables are included in the kit. To power up the unit, connect the cable from the power source to the cable coming from the unit's subrack (there is no on/off switch).

3. Place the two toggle switches on the audio control module in the down position. Place the VHF/AM transmitter module toggle switch and the VHF/AM receiver module toggle switch in the "NORM" position and make sure that both UHF/FM modules' toggle switches are in the "OFF" position.

4 Connect the microphone to the AM transmitter module. To use the low power internal speaker, switch the system monitor audio toggle switch to the "A" position, place the system monitor rotary function switch in position #2, and turn the rotary volume knob up to the desired level.
To use the external high power speaker, connect the speaker leads to the system monitor "METER" jacks, observing the correct polarity, switch the system monitor audio toggle switch to the "A" position, place the system monitor rotary function switch in position #1, and turn the system monitor rotary volume knob up to the desired level.

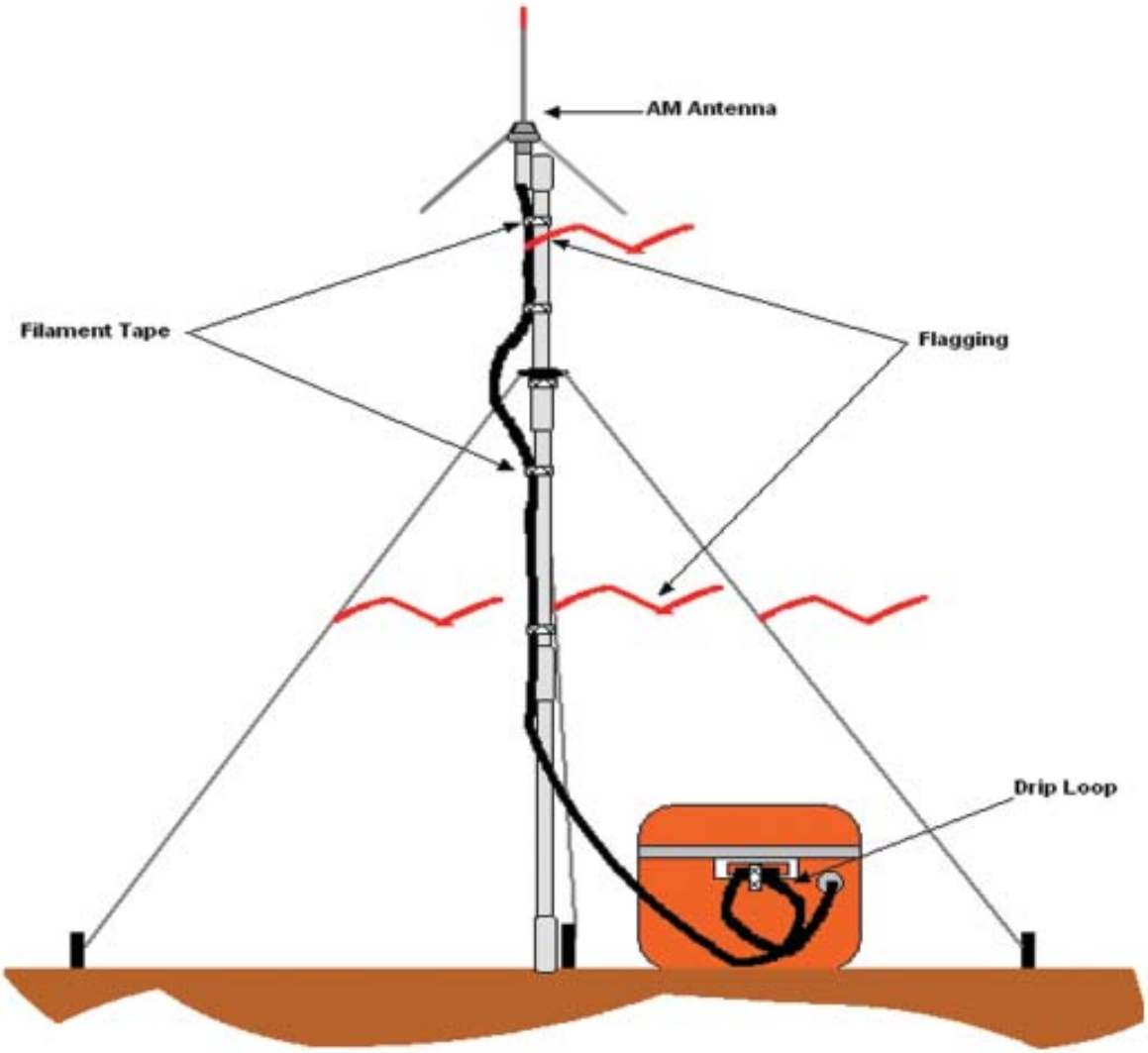
5. Set the desired AM frequency by turning rotary Switch A on the audio control module to the assigned channel . This switch controls both the transmitter and the receiver modules. Channels 1 through 6 are preprogrammed with AM simplex frequencies according to the AM frequency chart. **Channel 16** is user-programmable through the modules' front display faces.

To program an authorized frequency into **channel 16** of either the receiver or transmitter module: Turn rotary Switch A on the audio control module to **channel 16.** Then unlock the unit by hitting the "*" button and, before the "LOCKED" display goes blank, hit the "**down arrow button**" button. The display should now show

"UNLOCKED". Wait for the display to blank, then hit the "**down arrow button**" button. When the display is showing the frequency, press and hold either the "**down arrow button**" or "**up arrow button**" button until the desired frequency is reached. The transmitter and receiver modules must be individually programmed. The unit is ready for base station operation.

GROUND AIRCRAFT RADIO/LINK KIT

BASE STATION CONFIGURATION



4370 AM OMNI ANTENNA SETUP

15 VOLT BATTERY CONFIGURATION

GROUND AIRCRAFT RADIO/LINK KIT
NFES 4370

AC RADIO/LINK INSTALLATION

1. Before setting up either antenna, keep in mind that maximum antenna separation is mandatory. Be sure that the antennas' coax cables will reach the sides of the AC radio/ link kit box and allow for a drip loop.

2. Erect the AV-1 aircraft antenna as shown in the drawing, keeping in mind Step #1. Attach the coaxial cable through the hole provided in the left side of the fiberglass kit box to the Antenna A, AM port on the system monitor, using a 90° UHF connector (NFES #4180) at the port.

3. Erect the UHF omni-directional antenna as shown in the drawing, keeping in mind Step #1. Attach the coaxial cable through the hole provided in the right side of the kit box to the Antenna B, FM port on the system monitor, using a 90° UHF connector (NFES #4180) at the port.

4. Connect the battery leads as shown in the drawing. There are several power supply options available (12-15 Volts) and the corresponding cables are included in the kit. To power up the unit, connect the cable from the power source to the cable coming from the unit's subrack (there is no on/off switch).

5. Place the two toggle switches on the audio control module in the down position. Place both VHF/AM modules' toggle switches and both UHF/FM modules' toggle switches in the "NORM" position. Place the system monitor audio toggle switch in the center (off) position.

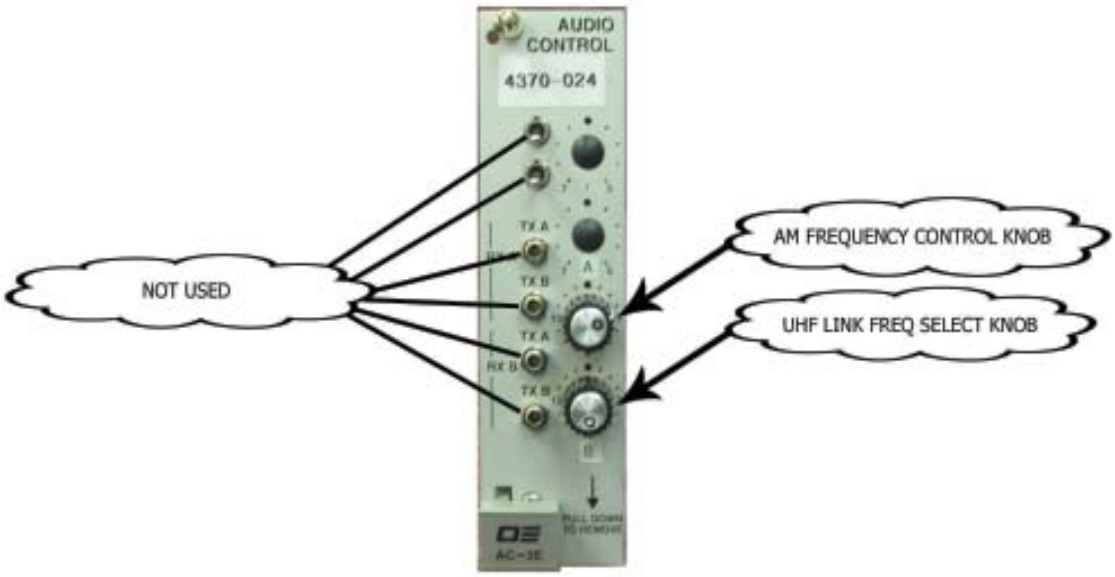
6. Set the desired AM frequency by turning rotary Switch A on the audio control module to the assigned channel . This switch controls both the transmitter and the receiver modules. Channels 1 through 6 are preprogrammed with AM simplex frequencies according to the AM frequency chart. **Channel 16** is user-programmable through the modules' front display faces.

To program an authorized frequency into **channel 16** of either the receiver or transmitter module: Turn rotary Switch A on the audio control module to **channel 16**. Then unlock the unit by hitting the "*" button and, before the "LOCKED" display goes blank, hit the

"**down arrow button**" button. The display should now show "UNLOCKED". Wait for the display to blank, then hit the "**down arrow button**" button. When the display is showing the frequency, press and hold either the "**up arrow button**" or "**down arrow button**" button until the desired frequency is reached. The transmitter and receiver modules must be individually programmed.

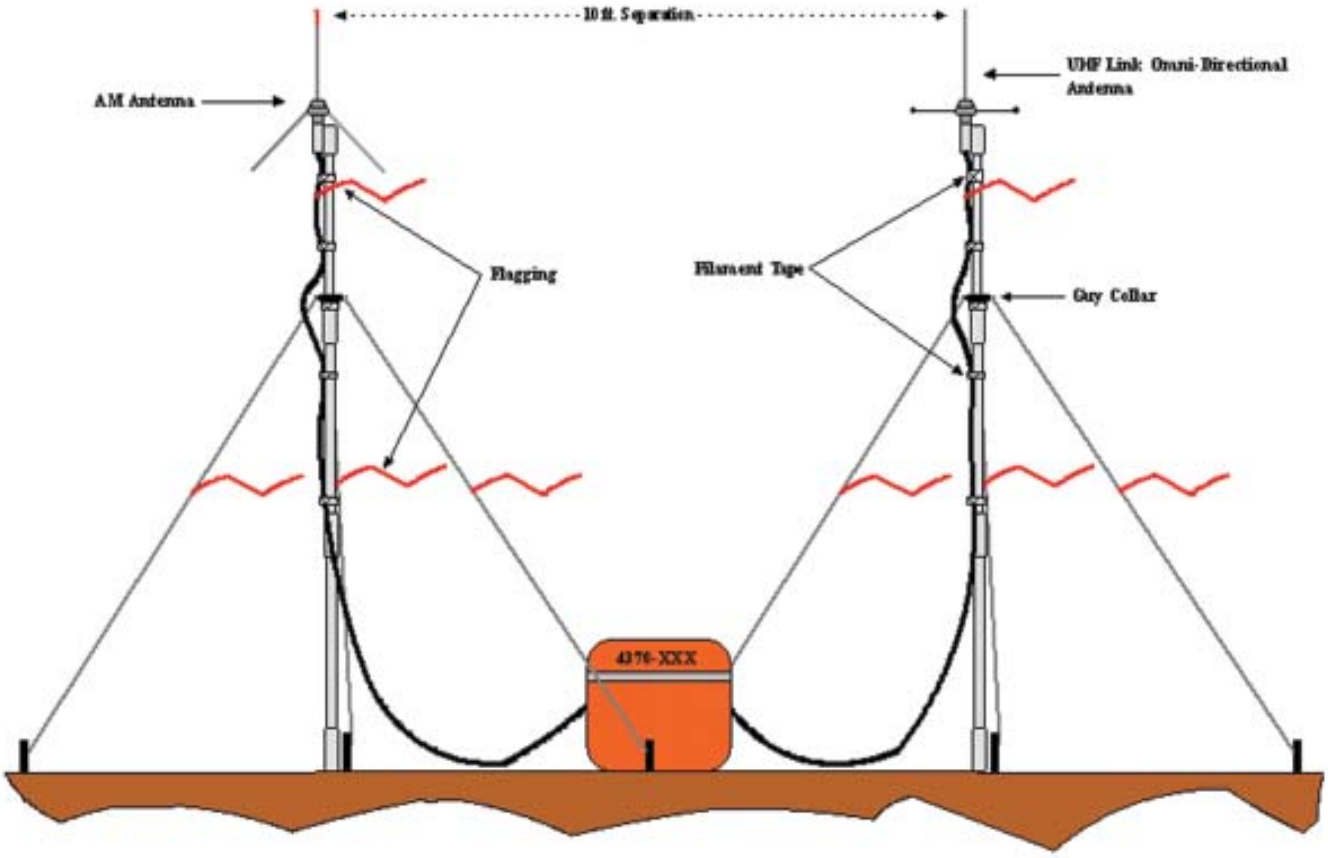
7. Set the desired FM frequency by turning rotary Switch B on the audio control module to the assigned channel according to the UHF/FM frequency chart. This switch controls both the transmitter and the receiver modules. The unit is now ready for link operation. Before leaving the site, perform a radio test through both antennas using both an VHF/AM and an UHF/FM handheld radio. Step at least 40-50 feet away from the unit while performing the test.

AUDIO CONTROL CARD FOR GROUND A/C RADIO/LINK



AN AUDIO CONTROL CARD FOR THE 4370 AIRCRAFT LINK

GROUND A/C RADIO/LINK INSTALLATION



AIRCRAFT LINK (4370) ANTENNA SETUP IN LINK CONFIGURATION

15 VOLT BATTERY CONFIGURATION

PUBLIC ADDRESS KIT
NFES 4410

The kit consists of one 20 Watt amplifier, 2 - 3 speakers designed for outdoor use, and tools and accessories necessary for installation.

1. Connect the amplifier to a power source.
   A. For 115Vac operation use the power cord provided. An extension cord is provided for added convenience.
   B. For 12 -15VDC operation, a similar cord is provided but with polarized clips rather than an AC plug. CAUTION: Observe polarity when operating the amplifier on 12 - 15VDC!

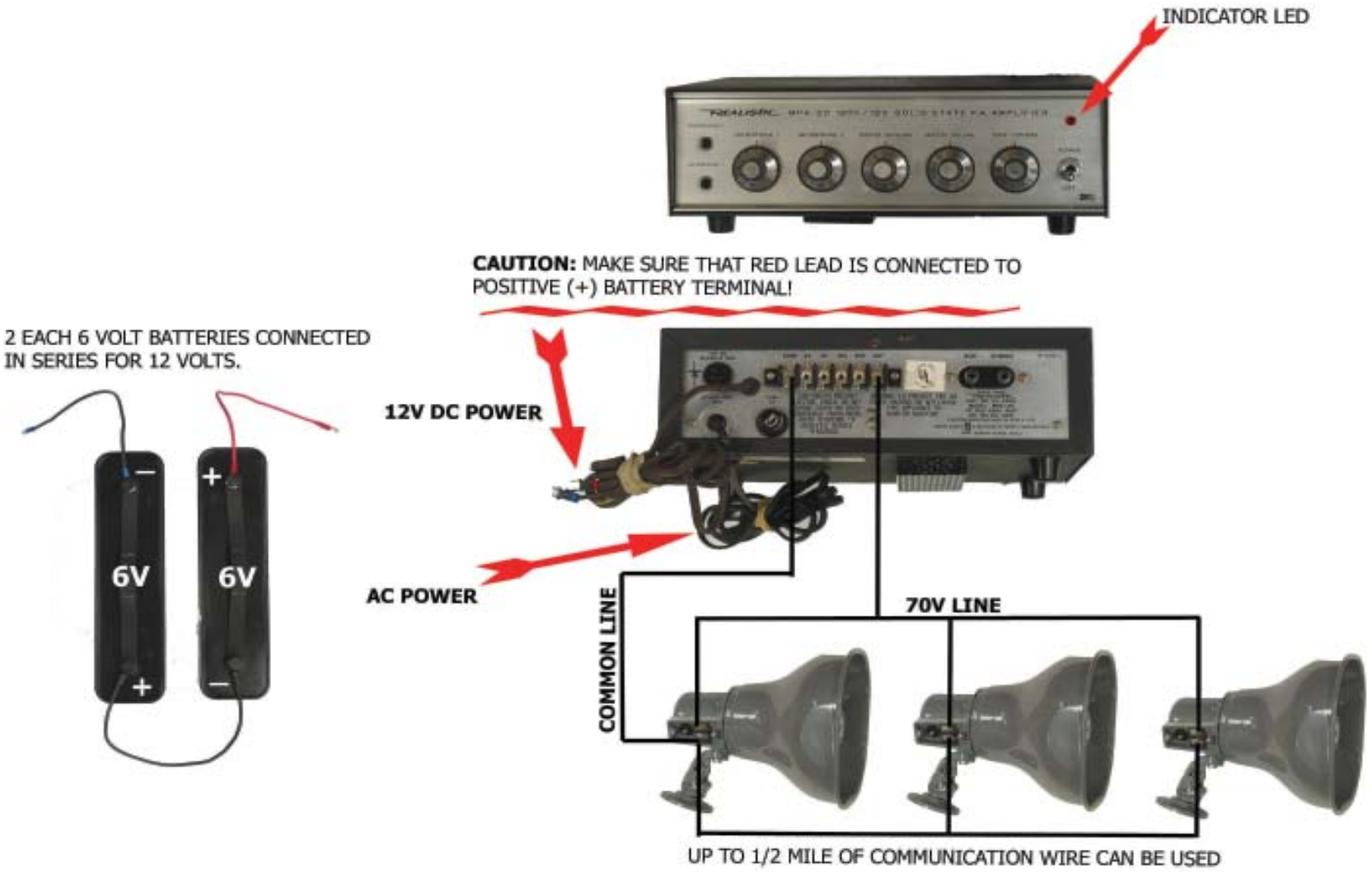
2. Connect the microphone to “MIC 1" or “MIC 2" on the front panel.

3. Connect the communication wire to the 70V and COM terminals on the rear panel.

4. String the communications wire to the remote speakers and connect the speakers as shown in the diagram. Use the wire nuts provided for these connections.

5. Before turning the amplifier ON, turn all volume controls to minimum. Place the ON-OFF switch to the ON position, rotate the master volume control about halfway. Adjust the correct MIC control until a satisfactory output is obtained. Any further adjustments should be made using the master control.

PUBLIC ADDRESS KIT
NFES # 4410



AIR ATTACK KIT INFORMATION
NFES 4499

October 26, 2004

The NFES 4499 Air Attack kit is a compact slip-in 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 VDC or 28 VDC. A storage compartment in the kit holds no equipment.

1. Kit Security: The NFES 4499 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 ridged structure in the cockpit (using common sense and keeping safety in mind).

2. Voltage Selection: The NFES 4499 Air Attack kit has automatic voltage selection for 14 VDC or 28 VDC. Automatic voltage selection is dependent upon the aircraft's power connector supplying the correct voltage to the Air Attack kit.

3. Aircraft Power & Audio Connections: Aircraft must have an MS3112E12-3S (female) power connector in the aircraft (ground on pin B, and 14 volts on pin C or 28 volts on pin A). Only 14 or 28 VDC 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 mike jacks. Aircraft mike 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 or equal) 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 antennas are for the AUX-1 and AUX-2 connections.

5. TFM-138B/TFDM-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.fs.fed.us/fire/niicd/documents.html

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 re-programmed. 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. These connectors allow handheld radios to be operated through the kit'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.

Transmitter Radio Selections:

1. COM is for the aircrafts' audio system via the kits' audio/mic jumper cable.
2. FM1 is for the 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 for simulcast transmissions using COM and FM1 radios. SC transmits on both radios simultaneously.

The pilot's 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) TFM-138B/TDFM-136 radio MAIN & GUARD switch; and the (3) aircrafts' audio selector panel switch.

Receiver Audio Selections:

1. COM is for the aircrafts' audio system via the kits' audio/mic jumper cable.
2. FM1 is for the 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. AUX-FM 2 has no receiver selector (transmitter selector must be set on AUX2 to hear AUX2 audio).
6. SC "simulcast" uses COM and FM1 receive toggle switches.

Audio Level: A receiver is automatically selected when its' companion transmitter is selected on the audio selector panel. Receive (RX) volume level 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 MIC jacks' have PTT capability using supplied PT-300 adapters. 28 VDC power input uses

7.5 amp circuit breaker and normally draws 3 amps transmitting. 14 VDC power input uses the 15 amp circuit breaker and normally draws 8 amps transmitting.

Keep in mind there are three (3) transmitter selector switches: TAC-250 transmitter selector knob; TDFM-136/TFM-138 radio MAIN & GUARD switch; and the aircraft's audio selector panel switch.

AIR ATTACK KIT
NFES 4499

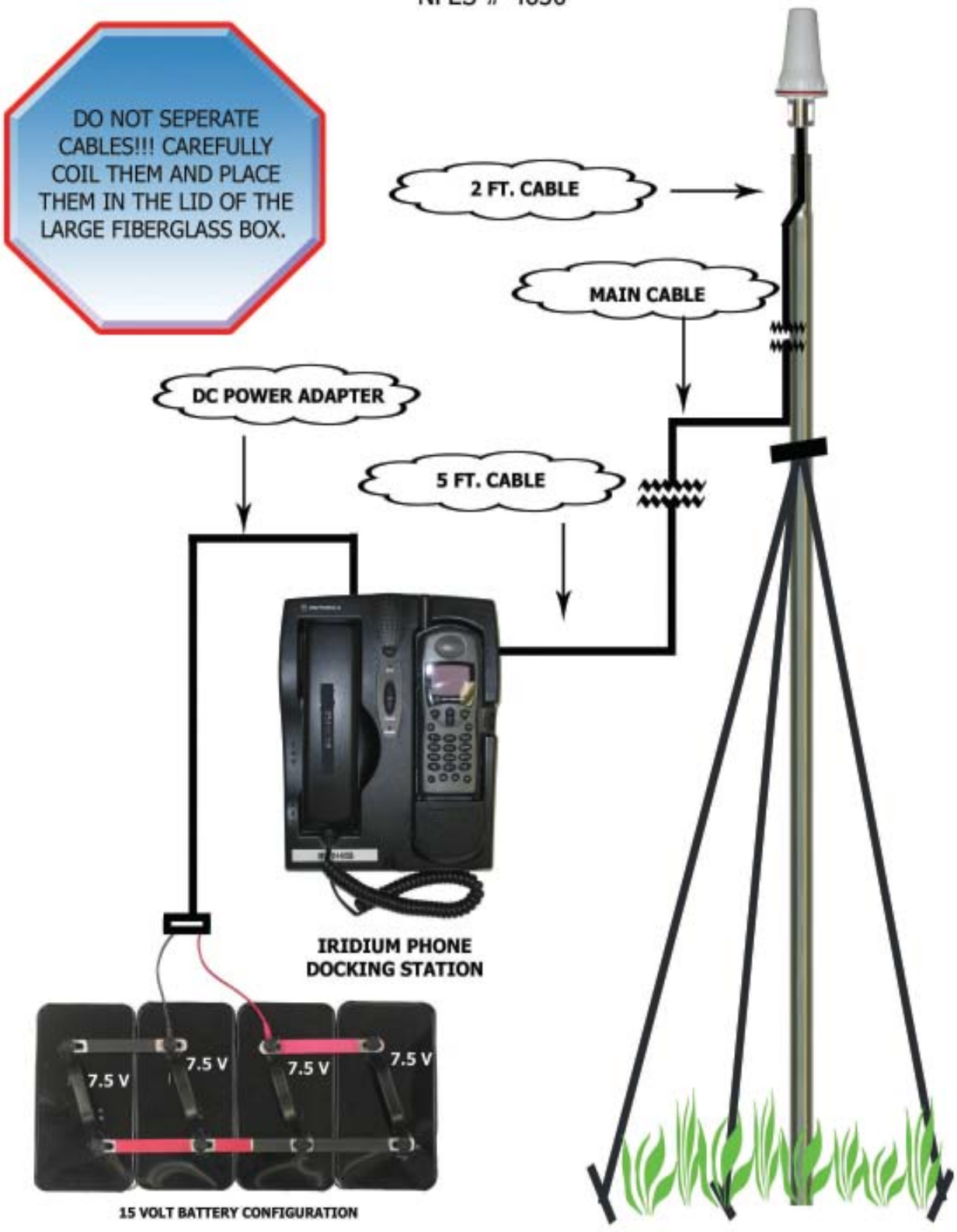
SATELLITE IRIDIUM PHONE KIT
NFES 4630

Satellite Iridium Phone Setup Directions
11/15/2004

1. Remove outdoor antenna from box and attach to 1st mast section. Make certain that the antenna has a unobstructed view of the sky.
2. Attach 2ft. cable to antenna and the main cable to the 2ft. section.
3. Slide guy rope collar over 2nd mast section and attach to 1st mast section.
4. Attach 3rd mast section to 2nd mast section, pound in guy anchors and raise mast.
5. Attach N type barrel to main cable then attach 5ft. cable to barrel. Attach the other end of the 5ft. cable to the right side of the docking station.
6. Attach DC power adapter to top of docking station. If AC power is available use AC power adapter.
7. Configure batteries as shown in diagram and attach power cord. (*If you are using vehicle power plug the Iridiums' DC power adapter into the vehicles power receptacle. Attach magnetic antenna directly to the right side of the docking station and place the antenna on the roof of the vehicle.*)
8. Turn phone on using the red button on the lower left side of keyboard.
9. Enter pin 1111 when prompted. Refer to World Comm. Document located in brown envelope. The mini SIM card has already been installed.
10. To place a call press and hold the '**0**+' key until the '+' appears and then dial as you would a long distance call. To call the phone when it is located in the U.S. the caller must dial '011' and then the 12 digit phone number. If the phone is located outside the U.S. the correct 3 digit international access code must precede the 12 digit phone number.

Do not attempt to remove phone from docking station!
Do not separate antenna cables!

SATELLITE IRIDIUM PHONE KIT
NFES # 4630



PORTABLE IR DOWNLINK KIT INFORMATION
NFES 4800

This portable IR downlink kit is designed for use only by Infrared Interpreters (IRIN)!! It is used to transfer data from the Infrared Aircrafts flying fire mapping missions to the IRIN on the ground in situations where delivery time is critical. All kits (20 ea) are designed with the novice user in mind. Easy to follow setup instructions are included so all the user need do is setup the antenna, connect a CAT5 cable to the computer, and turn it on. All data will be transferred by the technician in the aircraft to the "My Documents" directory on the included PC in the ground station.

This unit is designed to operate on 115Vac 60 Hz systems so the user will need to find a suitable power source. The data links utilize the 902-928 MHz public spectrum which has a 1 Watt power limitation, but since this is for **EMERGENCY USE ONLY** the National Interagency Incident Communications Division (NIICD) has been granted a license to use up to 5 Watts of power. Since this can cause severe interference in the public spectrum, this unit is to be utilized only when necessary and then turned off once transfer of data is complete. ****NOTE:** Do not shut this unit down until communications has been established to the aircraft and you have been notified that all data has been transferred.

The PC included in the kit is for use by the IRIN for the manipulation and viewing of the Infrared Imagery. Most applications needed by the IRIN are included, but in the event more applications are needed, administrative rights to install software/drivers have been installed. The procurement and installation of approved software is the IRIN's responsibility. A CD-R/W drive has been included in the PC so user created data can be removed. Procurement of suitable media is the responsibility of the IRIN. When the units are returned to NIFC, the hard drives will be restored to their original condition. Any data on the units will be completely and irretrievably erased. Data storage and archival operations are to be performed by the IRIN.

Kits can be delivered by the Infrared Aircraft but **ONLY** after an appropriate Resource Order for an NFES # 4800 has been placed and approved by the incident. Once the Infrared Aircraft is no longer needed over the incident, the units must be **PROMPTLY** returned to NIFC for refurbishment. The PC included in the kit is **NOT** to be used for other purposes.

MAFFS KIT
THIS KIT HAS NO NFES NUMBER IT IS ORDERED BY NAME ONLY

PHOTOS COURTESY OF THE FOLLOWING:

NIICD INFRARED OPERATIONS BRANCH

NIICD AVIONICS BRANCH

NIICD FIELD OPERATIONS BRANCH

USDA PHOTO ARCHIVES

APPENDIX A

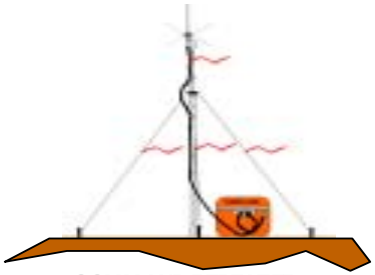
RADIO SYSTEM DIAGRAMS*

*These diagrams are also available for download online at:

http://www.fs.fed.us/fire/niicd/documents.html

COMMAND REPEATER WITH CMD/TAC RADIO KIT

1 EA 4312 COMMAND REPEATER KI
1 EA 4381 CMD/TAC RADIO KIT



COMMAND REPEATER

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

VHF

VHF

INCIDENT OPERATIONS AREA

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____

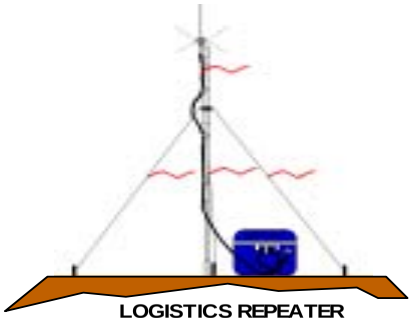
RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____

INCIDENT OPERATIONS AREA

DRAWING 1

LOGISTICS REPEATER WITH LOGISTICS RADIO KIT

1 EA 4248 LOGISTICS REPEATER KIT
1 EA 4244 LOGISTICS RADIO KIT



LOGISTICS REPEATER

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

UHF

UHF

INCIDENT OPERATIONS AREA

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____

INCIDENT OPERATIONS AREA

DRAWING 2

COMMAND/TACTICAL RADIO KIT AND COMMAND REPEATER WITH REMOTE KIT

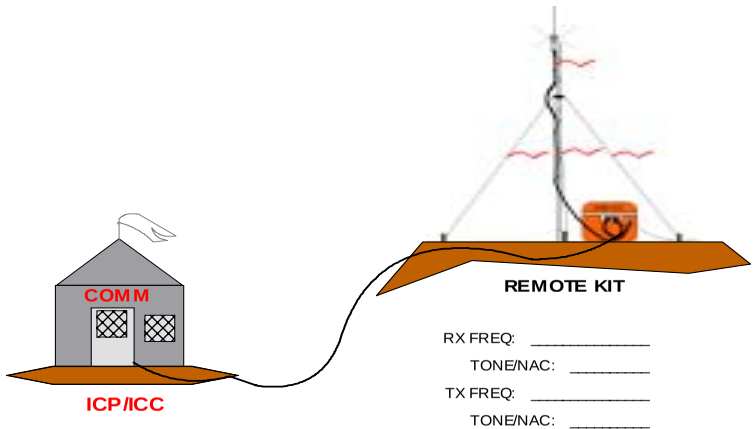
1 EA 4312 COMMAND REPEATER KIT
1 EA 4330 REMOTE KIT

COMMAND REPEATER

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

VHF

VHF



ICP/ICC

REMOTE KIT

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
KIT #: _____
LOCATION: _____
GROUP #: _____
CHANNEL #: _____

INCIDENT OPERATIONS AREA

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____

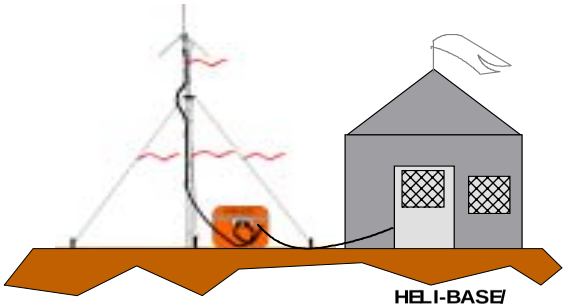
DRAWING 3

AIRCRAFT LINK SYSTEM (BASE CONFIGURATION)
GROUND TO AIRCRAFT COMMUNICATIONS

1 EA 4370 GROUND A/C RADIO/LINK KIT
(INCLUDES 4 EA ICOM HAND HELD RADIOS)

RX FREQ: _____
TX FREQ: _____

VHF-AM



HELI-BASE/ AIRPORT

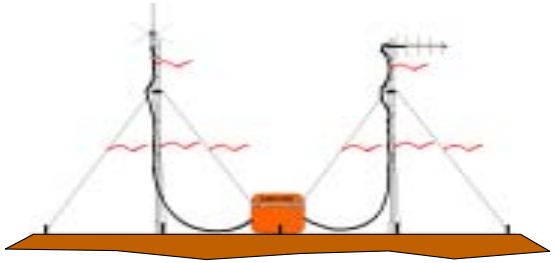
AIRCRAFT LINK IN BASE CONFIGURATION

RX FREQ: _____
TX FREQ: _____
KIT #: _____
AM CHANNEL #: _____
LOCATION: _____
LAT.: _____
LONG.: _____

DRAWING 4

COMMAND REPEATER LINKED WITH UHF LINK KIT TO LOGISTICS REPEATER

1 EA 4312 COMMAND REPEATER/LINK KIT
1 EA 4248 LOGISTICS REPEATER KIT
1 EA 4330 REMOTE KIT



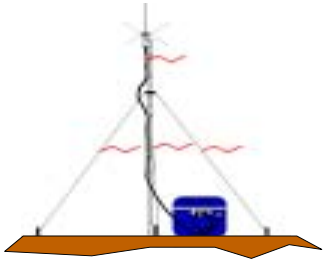
COMMAND REPEATER

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

UHF LINK

RX FREQ: _____
TX FREQ: _____
KIT #: _____
UHF CHANNEL #: _____

UHF



LOGISTICS REPEATER

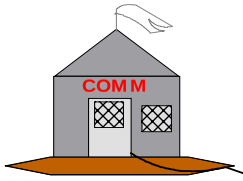
RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
KIT #: _____
LOCATION: _____
LAT.: _____
LONG.: _____

UHF

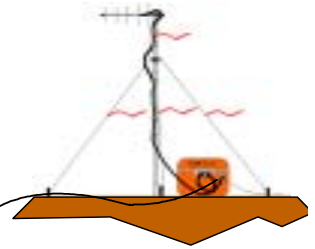
VHF

INCIDENT OPERATIONS AREA

RX FREQ: _____
TONE/NAC: _____
TX TONE: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____



ICP/ICC



REMOTE KIT

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
KIT #: _____
LOCATION: _____
GROUP #: _____
CHANNEL #: _____

DRAWING 5

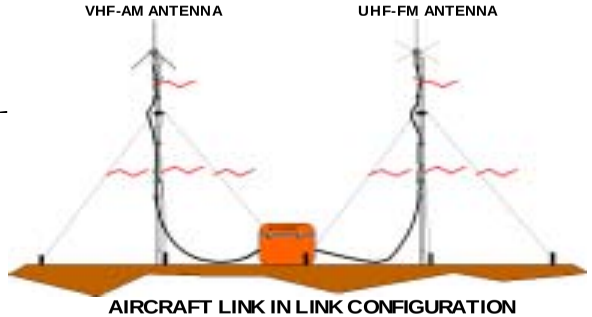
AIRCRAFT LINK SYSTEM (LINK CONFIGURATION)

1 EA. 4370 GROUND A/C RADIO/LINK KIT
(INCLUDES 4 EA. ICOM HAND HELD RADIOS)
1 EA 4330 REMOTE KIT W/YAGI ANTENNA

RX FREQ: _____

TX FREQ: _____

VHF-AM

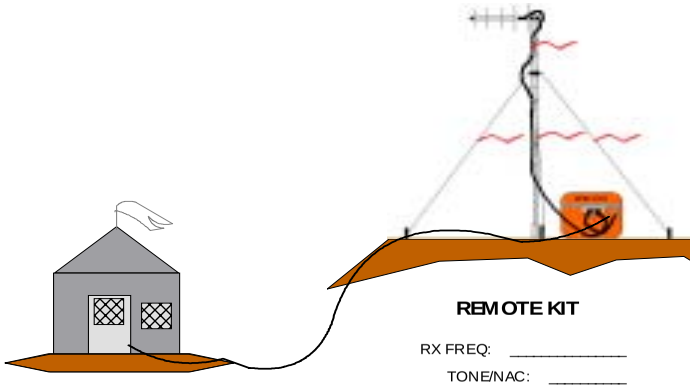


AIRCRAFT LINK IN LINK CONFIGURATION
VHF-AM TO UHF-LINK

AM RX FREQ: _____
AM TX FREQ: _____
KIT #: _____
AM CHANNEL #: _____
LOCATION: _____
LAT: _____
LONG: _____

UHF RX FREQ: _____
UHF TX FREQ: _____
KIT #; _____
FM CHANNEL #: _____

UHF-FM



HELIBASE/
AIRPORT

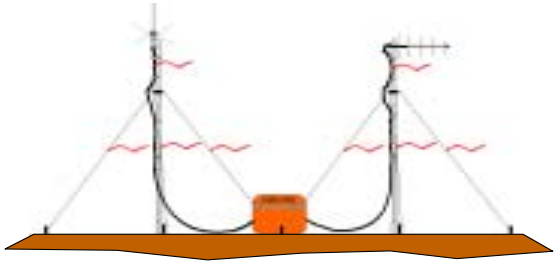
REMOTE KIT

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
KIT #: _____
LOCATION: _____
GROUP #: _____
CHANNEL #: _____

DRAWING 6

2- COMMAND REPEATERS LINKED WITH UHF LINK

2 EA 4312 COMMAND REPEATER/LINK KIT
1 EA 4381 CMD/TAC RADIO KIT



COMMAND REPEATER

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

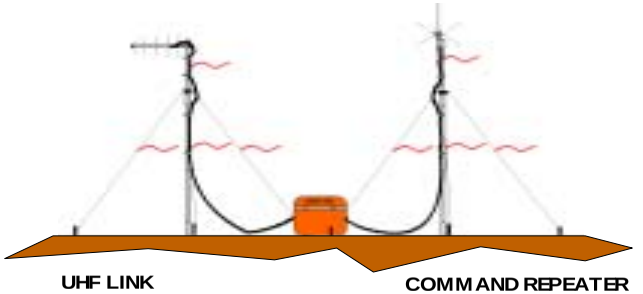
UHF LINK

RX FREQ: _____
TX FREQ: _____
KIT #: _____
UHF CHANNEL #: _____

UHF

UHF LINK

RX FREQ: _____
TX FREQ: _____
KIT #: _____
UHF CHANNEL #: _____



COMMAND REPEATER

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

VHF

VHF

INCIDENT OPERATIONS AREA

RX FREQ: _____
TONE/NAC: _____
TX TONE: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____

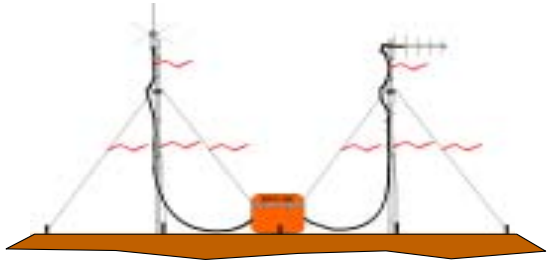
RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____

INCIDENT OPERATIONS AREA

DRAWING 7

2- COMMAND REPEATERS LINKED WITH UHF LINKS AND REMOTE TO ICP

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



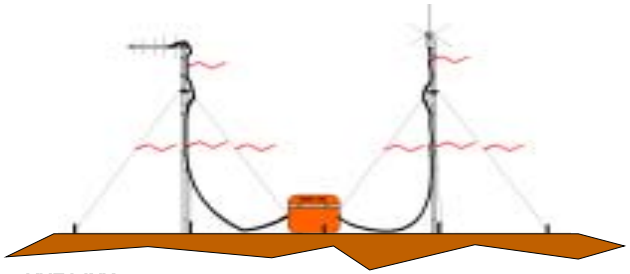
COMMAND REPEATER

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

UHF LINK

RX FREQ: _____
TX FREQ: _____
KIT #: _____
UHF CHANNEL #: _____

UHF



UHF LINK

RX FREQ: _____
TX FREQ: _____
KIT #: _____
UHF CHANNEL #: _____

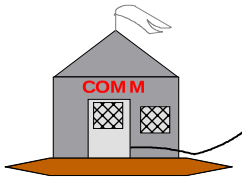
COMMAND REPEATER

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

VHF

VHF

VHF



ICP/ICC

REMOTE KIT

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
KIT #: _____
LOCATION: _____
GROUP #: _____
CHANNEL #: _____

INCIDENT OPERATIONS AREA

RX FREQ: _____
TONE/NAC: _____
TX TONE: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____

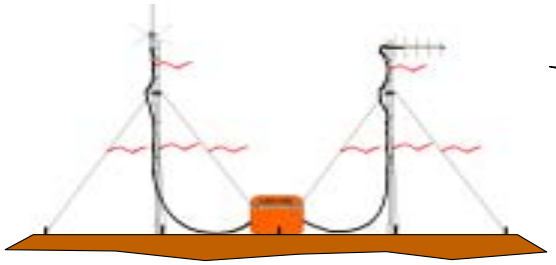
RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____

INCIDENT OPERATIONS AREA

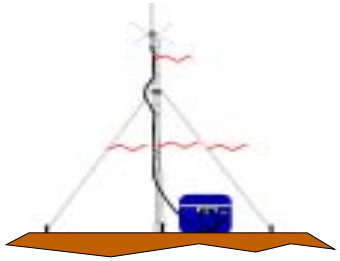
DRAWING 8

2- COMMAND REPEATERS LINKED WITH UHF LINKS TO UHF REPEATER

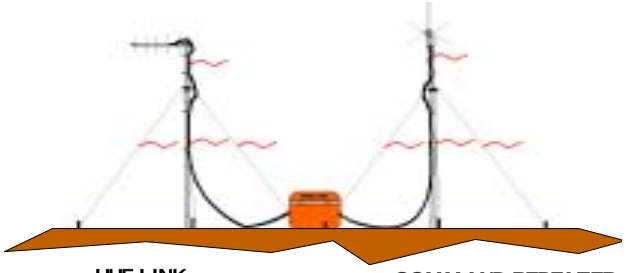
2 EA 4312 COMMAND REPEATER/LINK KIT
1 EA 4248 LOGISTICS REPEATER KIT
1 EA 4381 CMD/TAC RADIO KIT



UHF



UHF



COMMAND REPEATER

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

UHF LINK

RX FREQ: _____
TX FREQ: _____
KIT #: _____
UHF CHANNEL #: _____

LOGISTICS REPEATER

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

UHF LINK

RX FREQ: _____
TX FREQ: _____
KIT #: _____
UHF CHANNEL #: _____

COMMAND REPEATER

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

VHF

VHF

INCIDENT OPERATIONS AREA

RX FREQ: _____
TONE/NAC: _____
TX TONE: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____

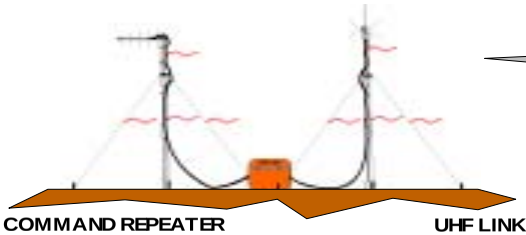
RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____

INCIDENT OPERATIONS AREA

DRAWING 9

3- COMMAND REPEATERS LINKED WITH UHF LINKS TO UHF REPEATER

3 EA 4312 COMMAND REPEATER/LINK KIT
1 EA 4248 LOGISTICS REPEATER KIT
3 EA 4330 REMOTE KIT



COMMAND REPEATER

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
KIT #: _____
LOCATION: _____

UHF LINK

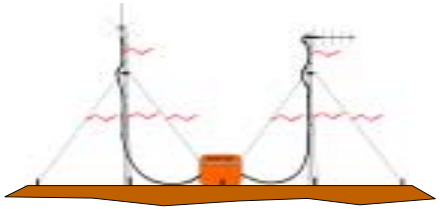
RX FREQ: _____
TX FREQ: _____
KIT #: _____
UHF CHANNEL #: _____
LAT.:_____
LONG.:_____

VHF

INCIDENT OPERATIONS AREA

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
GROUP #: _____
CHANNEL #: _____

UHF



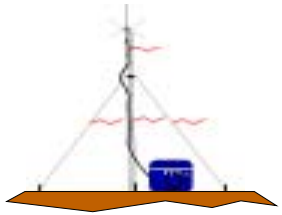
COMMAND REPEATER

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

UHF LINK

RX FREQ: _____
TX FREQ: _____
KIT #: _____
UHF CHANNEL #: _____

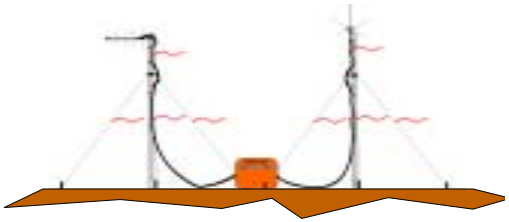
UHF



LOGISTICS REPEATER

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

UHF



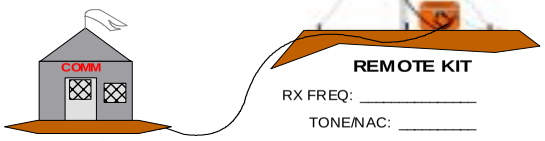
UHF LINK

RX FREQ: _____
TX FREQ: _____
KIT #: _____
UHF CHANNEL.: _____
LAT.: _____
LONG: _____

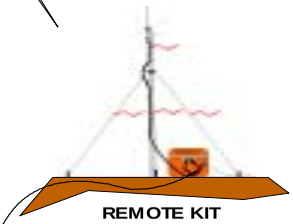
COMMAND REPEATER

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
KIT #: _____
LOCATION: _____

VHF



CAMP/ICP

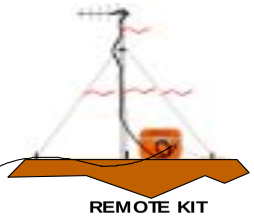


REMOTE KIT

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
KIT #: _____
LOCATION: _____
GROUP #: _____
CHANNEL #: _____

UHF

CAMP/ICP

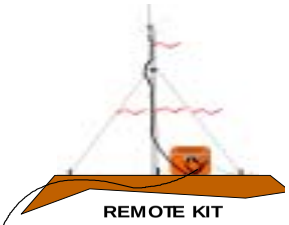


REMOTE KIT

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
KIT #: _____
LOCATION: _____
GROUP #: _____
CHANNEL #: _____

VHF

CAMP/ICP



REMOTE KIT

RX FREQ: _____
TONE/NAC: _____
TX FREQ: _____
TONE/NAC: _____
KIT #: _____
LOCATION: _____
GROUP #: _____
CHANNEL #: _____

DRAWING 10