

# **AIRCRAFT DISPATCHER**

## **Appendix D**

### **Frequencies and Management**



# FREQUENCIES AND MANAGEMENT

03/10/03

The following is a brief overview of frequencies which include a glossary of terms, frequency management techniques, description of frequencies, utilization, and some equipment.

## Glossary:

**Air Attack Kit (NFES 4499):** This kit is available from NIFC for use in vendor aircraft that do not have extensive communications packages incorporated into the console. It will provide an Air Tactical Group Supervisor or observer with the capabilities of accessing two FM frequencies simultaneously. One kit is assigned on a preposition basis within each Geographic Area, and supplemental orders must be for on-going incidents. If there is adequate need, units may purchase a kit for their local vendor aircraft.

**Air Tanker Base Frequency:** Designated as 123.975, this Nation-wide frequency is used for communications between an air tanker base and tactical aircraft being supported by the air tanker base. The primary information that will be conveyed over this channel are requests for retardant, fuel, etc., parking instructions and flight following information when the air tanker base has been given that responsibility by the dispatch organization.

**Air to Air Frequency:** Most often representing an AM frequency, but sometimes referring to a limited number of FM frequencies. These are very often considered “discrete” air to air frequencies that are limited to Air Operations to eliminate the potential of ground operations from breaking in on the channel while precise air operations are taking place.

**Air to Ground Frequency:** Describes both AM and FM frequencies used for flight following and ground-to-air tactical missions. AM—flight following; FM—ground-to-air tactical.

**Channel:** A designation (i.e., number and/or letter, color on a dial . . .) for a frequency or pair of frequencies.

**Command-Tactical Frequency:** These VHF-FM frequencies are generally utilized on large fires for communicating command and/or tactical information from ground to ground or air to ground.

**Communications Technician (COMT):** Generally works for the Communications Unit Leader within the Logistics Section of an Incident Management Team. Is responsible for setting up, maintaining and dismantling of communications equipment on an incident.

**Communications Unit Leader (COML):** Works for the Logistics Section Chief on an Incident Management Team and is responsible for Communications Technicians duties if none is ordered. Is also responsible for supervising any Incident Communications Manager(s) (INCM), and or Radio Operators (RADO).

**Duplex:** A pair of channels that are combined to provide a separate transmit (TX) and receive (RX) channel. Almost all of these currently in use are provided with a third frequency that is referred to as a Tone Guard (also see Tone Guard and Repeater).

**Communications Coordinator (COMC) - “Frequency Coordinator”:** A person with technical and operational background who is ordered when there is sufficient competition for frequencies and/or air time to potentially generate safety concerns. The National Mobilization Guide (Section 22.6) indicates that a COMC must be assigned by and to the Geographic Coordination Center when a second Starter Kit (NFES 4390) is assigned to any incident within a 100 air mile radius of the first assigned Starter Kit. This position may also be placed at an expanded dispatch, or at a local unit. It is also recommended that if a temporary control tower is ordered, that a “Frequency Coordinator” should also be ordered if none is currently operating in that area.

**kHz:** Kilohertz equal to one thousand cycles per second.

**Logistical Frequency:** These UHF frequencies are often used for local support on incidents (i.e., camp, ground support and security operations), and with specific repeaters to provide a logistics repeater channel for ordering supplies and equipment from Expanded Dispatch.

**Military Operations:** National Guard, and in some instances, regular military can be activated by State agreement to assist in suppression of wildfires. When these operations occur, be aware that many Military & National Guard aircraft do not have compatible communications with Federal fire suppression forces. This can generate a significant safety issue as coordination of air resources can be limited or non-existent. It is not uncommon in these instances to attempt to ground the military and/or National Guard until they can be fitted with the appropriate communications packages. If it is an assist effort to suppress fire on military lands, and the fire burns off of the military lands, it may be advisable to suggest limiting military aircraft to protecting their own part of the fire. However, safe guards still need to be in place to assure adequate separation.

**MHz:** Megahertz equal to one million cycles per second.

**Narrow Banding:** This is a technological step to increase the number of available frequencies for private and government use. This is being accomplished with new more sophisticated equipment that can separate the existing band into more channels by splitting frequencies at the 10,000<sup>th</sup> of a MHz (i.e., between 164.150 and 164.175, a new frequency of 164.1625 will be available).

**National Flight Following (Air Net) Frequency:** Designated as 168.650 for utilization of flight following. This frequency is particularly important for tracking aircraft traveling long distances. When all dispatch locations have this frequency, an aircraft will be able to monitor a single channel to complete flight following instead of attempting to dial in many local primary frequencies along the way.

**National FM Frequencies:** There are currently five “Tactical” Frequencies that have been approved for National use west of 100 degrees longitude. These frequencies are designated for air- to-ground use on extended attack or large incidents.

These frequencies are for national interagency use only. Approval for use is given by the National Incident Interagency Communications Division (NIICD), Communication Duty Officer (CDO) in Boise, or Communication Coordinator (COMC) in the field.

**“National” Guard Frequency:** Designated as 168.625, this frequency is specifically designated as an “EMERGENCY channel. And it is also emphasized that Fire Operations are not considered an emergency operation. This channel is for brief use in attempting to provide an open channel monitored by all agency aircraft and many dispatch locations for immediate safety concerns (e.g., gear is not down for landing, your cargo door is ajar, there is a moose on the runway, that approach for the drop is not steep enough to clear the ridge.) Use of Guard is not to be used for flight following, initial call-up and any other none-safety related communications unless all other viable frequencies have been attempted.

**Receive Frequency (RX):** The frequency utilized to receive on a channel.

**Repeater:** An aid in transmitting long distances or over rough terrain by placing the unit at a location (generally a mountain top) that will take a channel from one line of sight area and expose the channel to another line of sight area. The channel has to be a duplex frequency and works like this: A fire is burning in two canyons. In order that everyone on the fire can communicate, a communications technician places a Command-Tactical repeater in a position that looks into both canyons (it may or may not be on the ridge line between the two canyons). A message is sent on the appropriate repeater VHF transmit (TX) frequency on a duplex channel and strikes the repeater antenna. At that point, the signal is internally switched via intermediate UHF frequencies to another VHF-FM frequency and rebroadcast to the receive (RX) frequency of the duplex channel. A logistical repeater works in a similar fashion but utilizes UHF TX, RX, and intermediate VHF frequencies.

**Simplex:** A single channel that is used both for transmit (TX) and receive (RX).

**Starter Kit (NFES 4390):** This kit is available from NIFC for large incident support. The kit provides the incident with Air to Ground (AM), Command-Tactical (FM), Logistical (UHF), and specific kit related Command-Tactical and Logistics Repeater units. These kits also provide adequate radios and batteries for a large operation. When a kit is requested, a latitude and longitude are requested in order to assist the National Frequency Coordinator in issuing pre-set repeat frequencies that will not conflict with any other starter kit frequencies that are already issued to that area.

**Temporary Control Tower:** A temporary control tower is recommended when aircraft safety is a significant concern. Examples of some of these concerns are:

- Heavy smoke has limited extensive incident aircraft operations in an area.
- Extensive incident(s) aircraft operations are occurring within 5 miles of an uncontrolled airport.
- Multiple large incidents are overlapping portions of their operational airspace.

If operations are sufficiently complex to order a tower, it may be appropriate to order a Frequency Coordinator for the area of concern or for the Geographic Coordination Center. More information on temporary towers is available in Section 24.14 of the National & Great Basin Interagency Mobilization Guides. Staff, equipment, and frequencies are normally provided with the tower. However, there may be instances where the FAA requests assistance with any and all of these items.

**Tone Guard:** These frequencies are used as a code to activate a specific repeater. Thirty-eight tones are currently recognized as standard tones and they range between 67.3 and 250.3. The federal wildland fire agencies use 16 tones nation wide.

**Transmit Frequency (TX):** The frequency utilized to transmit on a channel.

**UHF Frequency (Ultra High Frequency):** These frequencies span 406.000 to 470.000 MHz and have good short and intermediate range carrying characteristics. These frequencies are most frequently utilized for Command-Tactical operations (initial & extended attack incidents). Unit work channels, some air to air and air to ground operations, and transmit and receive channels for many repeaters.

**VHF-AM Frequency (Very High Frequency-Amplitude Modulation):** These frequencies span 118.000 to 135.975 MHz and have good short and moderate intermediate range carrying characteristics. These frequencies are controlled by the Federal Aviation Administration because they are used almost exclusively for aircraft air to air and air to ground operations. Although some private aircraft have FM capabilities, all aircraft are required to have AM capabilities.

**VHF-FM Frequency (Very High Frequency-Frequency Modulation):** These frequencies span 150.000 to 173.975 MHz and have good short and intermediate range carrying characteristics. These frequencies are most frequently utilized for Command-Tactical operations (initial & extended attack incidents) unit work channels, some air to air and air to ground operations, and transmit and receive channels for many repeaters.

**Victor Frequency:** Victor is the phonetic representation for the letter V. When dealing with frequencies it generally represents VHF-AM frequencies.

**Frequency Management:** There are two primary elements associated with frequency management. The first and foremost is safety. The second element is service. A good manager will attempt to ascertain the specific need for a frequency, determine if that is serving the needs of the requestor, is the best type of frequency for the purpose needed, and is not generating safety concerns.

*Examples of determining a need* includes knowing what frequencies they are already using and for what purpose. This may allow adjustment of their use, and cover the needs with the existing frequencies.

*Example of determining service* includes understanding the type and amount of extra communications so that an adequate system can be set up.

*Example of best frequency for the purpose* includes recommending frequencies that are authorized for an express purpose, and that have the type of carrier characteristics that will serve the purpose. A specific example would be determining that a frequency is needed to link several areas that are not line of sight and using the same VHF-FM command-tactical simplex frequency. This would require a repeater and a change in frequencies because the repeater is the only way to link the areas, and the change in frequencies would have to be to a duplex frequencies (repeaters cannot receive and broadcast on the same channel . . .it will cause a “loop” in the repeater and “lock it up”).

*Example of frequency generating a safety concern* include when a designated discrete air to air frequency has also been mounted into a remote mountain top location for the express purposed of an air to ground link between dispatch and aircraft in their jurisdiction. This would cause safety concerns if a heavy air operation were occurring and the dispatch office was attempting to “break in” for the purposes of fire status update, or flight following. This could override the air to air communications and potentially cause an aircraft to miss key operational or safety related information.

**Air to Air AM Initial Attack Frequencies:** These frequencies are issued annually by the Federal Aviation Administration for the express purpose of incident air to air communications. These frequencies are given to the National Incident Interagency Communications Division (NIICD) and then provided to all of the western Geographic Coordination Centers (except Alaska). The Coordination Centers are given the authority (see National Interagency Mobilization Guide, Section 23.4.3, paragraph 2) to administer these frequencies for their Area dispatch jurisdictions Initial Attack needs. Each Geographic Area has been split into Initial Attack zones that are generally split along highways, railroads, major divides, drainages, state and/or Geographic Area boundaries. This is for ease of local dispatch offices to issue the appropriate frequency to aircraft for the appropriate zones. Pilots generally understand that this is the frequency to tie into for safe approach to a fire location. The pilot in charge of air operations (air tactical group supervisor, lead plane pilot or “primary pilot”) would normally have a map of the

adjoining zones and if the incident were near the edge of a zone, they would initially check the adjoining frequency to determine if any other aircraft are operating in proximity to their incident. This should limit the “confliction” safety concerns of the pilot in charge of air operations.

If the primary initial attack air to air frequency is being utilized by multiple fire operations, and the communications traffic exceeds safe levels (as determined by the pilot in charge of any incidents), they can request an additional frequency. This frequency can be ordered by the dispatch office from the Coordination Center on an aircraft request number. Once the new frequency is issued, there are some safety issues that needs to be recognized. Changing a frequency in any portion of an operational period can be confusing and subsequently unsafe. To assure the confusion is limited, the dispatch office and pilot in charge of the air operation should consider delaying implementation until the next operational period to allow everyone to get the new frequency. If this does not appear to be feasible, the dispatcher and pilot should make a maximum effort to alert all aircraft, bases, and dispatch offices involved that a change will occur at a specific time.

If and when an Incident Management Team takes over, is on sight and have set up their Starter Kit (NFES 4390), they are responsible for releasing any AM initial attack frequencies. The Incident Communications Unit Leader has adequate frequencies associated with the Starter Kit to initially provide for the large fires needs. If the Communications Unit Leader indicates they do not have adequate frequencies to operate, the Coordination Center should consult the Communications Duty Officer (CDO) or a Communications Coordinator (COMC), if assigned.

### **Nationally Designated Frequencies:**

For information on nationally designated frequencies, contact the National Incident Interagency Communications Division.

### **Reference Sources:**

–*Great Basin Mobilization Guide*, Aviation Communications Plan Supplement, Most recent version (second to last section of the guide).

–*Hotsheet for Incident Communications*, Periodical, Royce Shearing, Incident Communications Support Unit, Boise Interagency Fire Center, Boise, Idaho (208) 387-5718.

–*National Incident Radio Support Cache User's Guide* (NFES 0968), Most recent version—revised annually (208) 387-5644.

–*Wildland Firefighters' Frequency Guide*, Most recent version, P.J. Smith, Salmon-Challis NF, Challis Ranger District (208) 879-4117.