SIMPLEX EQUIPMENT AND OPERATIONS

15 MINUTE SIMPLEX NET TRAINING SESSION

SIMPLEX OPERATIONS & EQUIPMENT

- For the next few meetings, we will be discussing simplex operations and equipment.
- The purpose of these discussions is to get everyone involved with amateur radio emergency communications to seriously consider the ramifications of performing our function with limited or no operational VHF/UHF repeaters.
- The audience for these discussions includes all amateur radio Emcomm volunteers including those involved with ARES, RACES, CERT, Skywarn, and the growing number of local non-profit and/or religious relief organizations.

WHY CONSIDER SIMPLEX?

- We live in tornado alley. Tornados occur in our state at a rate of 32 per year.
- 40 to 50 thunderstorm days per year occur in the St. Louis area alone.
- There are often power outages associated with severe weather events.
- UPS systems designed for radio repeater applications can be expensive.
- Many area repeaters, especially private and club repeaters are not engineered for the punishment of severe weather conditions.

LET'S CONSIDER THINKING SIMPLEX

- The following few slides are excerpts from various ARES/RACES sources on the Internet that stress the importance of thinking simplex.
- Again, the purpose of these slides is to stimulate discussions and thinking about Simplex among amateur radio Emcomm volunteers.

SIMPLEX THINKING

- **If amateurs take repeater systems for granted and depend on them, groups such as ARES and RACES are less able to respond during an emergency.**
- If one or more repeaters go off the air from wind, rain, or power failures, remaining ones can become overloaded. It is difficult to coordinate regional activities if everyone uses the same few repeaters!

SIMPLEX THINKING

- **Realistic disaster training anticipates that some or all local repeaters may be unavailable.**
- After a severe storm, repeaters may be on battery power, which should be conserved, so we shouldn't expect them to "always be there" to compensate for weak individual stations. Local and regional plans must stipulate when simplex is appropriate, including guidance to manage communications if one or more repeaters go "down."

SIMPLEX THINKING

- **Repeaters are appropriate for "talk-in" and to reach into areas with poor simplex coverage**, but don't use them for your primary working frequency for an event covering a small area.
- If an event covers a radius of only a few miles, consider using simplex instead of tying up a machine. Keep repeaters available for inter-jurisdictional, priority traffic, as a backup, for alerting, etc. when wide-area coverage is really needed.

SIMPLEX THINKING

- **Operators need to know assigned simplex frequencies to use for local nets**, which follow approved band plans and channelization!
- A laminated wallet card with a contact list of emergency telephone numbers and a regional frequency list is recommended.
- The ICS-205 is the primary document for “governmental” amateur radio Emcomm frequencies including ARES, RACES, and CERT
- Non-governmental Emcomm groups should also have assigned simplex frequencies.

ICS-205 FOR USE IN SIMPLEX NETS

INCIDENT RADIO COMMUNICATIONS PLAN		Incident Name Simplex Nets	Date/Time Prepared TBD	Operational Period Date/Time TBD
4. Basic Radio Channel Utilization				
Function	Radio Type/Cache	Group/Channel	Frequency/Tone	Assignment	Remarks
Initial Contact	Amateur	Repeater Output	145.490 MHz/CSQ	Initial Contact	Move from repeater output to primary simplex frequency
Primary Simplex - VHF	Amateur	VHF - HVTAC 7	146.595 MHZ/CSQ	Primary Net	Primary Net Frequency
Backuip Simplex - VHF	Amateur	VHF - HVTAC 6	146.505 MHz/CSQ	Backup Net	Backup Net Frequency
Primary Simplex - UHF	Amateur	UHF - HUTAC 7	446.075 MHz/CSQ	Local UHF Net	UHF Primary
Backuip Simplex - UHF	Amateur	UHF - HUTAC 8	446.100 MHz/CSQ	Backup UHF Net	UHF Backup
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SIMPLEX THINKING

- **"Elmering" Should Teach Basic Skills**
- New operator classes should stress operating skills, "good amateur practice," safety, preparation and proper use of equipment, beyond the minimum needed to "pass the test." Encourage new hams to participate in public service events and nets to learn essential skills, such as handling formal traffic, so they will gain experience and confidence enabling them to become skilled, effective emergency communicators.

SIMPLEX THINKING

- **Stress in nets, club events and exercises – the appropriate use of simplex while teaching directed net procedures.**
- Show why, how and when to change from repeater to simplex operation. Instruct operators to listen routinely to a repeater's input frequency. If both stations have good copy, change to simplex and free up the machine. Pause 2-3 second breaks between transmissions, for stations with priority traffic, or needing relays.

SUMMARY

- These are just some of the recommendations on the internet from various amateur radio Emcomm groups around the country.
- Next half, we will continue with additional thoughts about simplex and start talking about equipment needs for simplex.
- "HOMEWORK" – Start talking with your fellow hams about whether you think "Simplex Thinking" should be a part of what we do to support our served agencies.

SIMPLEX EQUIPMENT AND OPERATIONS PART 2

15 MINUTE SIMPLEX NET TRAINING SESSION

WHY CONSIDER SIMPLEX?

As we said last session:

- Severe weather happens often in our area.
- Tornados are common events in the Midwest.
- Many area repeaters, especially private and club repeaters may are not engineered for the punishment of a severe weather event.

SIMPLEX THINKING

- **Teach new operators the routine use of relays to operate in a simplex environment.**
- On simplex, it is important to open the squelch to listen for weak stations, instead of keeping it tight to reduce noise. New operators also need to be taught to use plain language, correct "pro words" and ITU phonetics on phone and how to program a new frequency, offset and CTCSS tone not already in memory.

SIMPLEX THINKING

- **Hand held transceivers are not adequate as primary rigs for emergency communications!**
- If a HT signal is so weak that it cannot be copied, it takes double the air time and battery consumption from others to provide relays, repeats or fills. Having "only an HT" limits you to nearby repeaters or simplex within a few miles.

SIMPLEX THINKING

- **Stress the use of minimum power needed for reliable communication**, but remember that with simplex, the emphasis must be on **RELIABLE!**
- New operators of driving age should buy 50w mobiles as first rigs, because they cost no more than a HT, but have better simplex performance. When you can afford a spare rig, THEN buy a sturdy dual-band HT! Guidance is necessary on appropriate power for working simplex versus local or distant repeaters.

SIMPLEX THINKING

- **If a repeater goes off the air, operators need adequate power to continue on simplex**, including listening for and relaying weak stations!
- Use enough output power to get your traffic through the first time, but don't waste your batteries with inefficient use of excessive power, causing interference to distant stations you cannot hear!

SIMPLEX THINKING

- **Mobile/portable VHF operators for county-wide nets need 25 watts output** and at least a 3db gain antenna elevated 15 ft. or more above ground elevation.
- Hand held users need external battery power to maintain 5w into a higher-gain directional antenna, such as a 3 or 4-element Yagi, or to augment their HT with a 25-30w brick amplifier into an elevated Omni-directional antenna, such as a J-pole. Fixed stations need equivalent antenna height and gain with adequate auxiliary power to last a minimum of 24 hours.

SIMPLEX THINKING

- **The importance of increasing antenna height cannot be stressed highly enough.**
- A 4-element Yagi elevated 15 ft. with 25w from an HT+brick amp out performs 100 watts into a typical mobile whip mounted on the car trunk lid.

SUMMARY

- These are just some of the recommendations on the internet from various amateur radio emcomm groups around the country.
- Next week, we will continue with additional thoughts about simplex and equipment needs for simplex.
- **"HOMEWORK"** – Talk with your fellow hams about whether you think **"Simplex Thinking"** should be a part of what we do to support our served agencies.