

# **SKYWARN**

## **NET CONTROL**

### **OPERATIONS MANUAL**

#### **National Edition**

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#### **EDITED FOR SUBURBAN AND RURAL APPLICATION 1997**

**EDITOR'S NOTE:** Much of this manual was originally written for NWS/SKYWARN operations in what is a fairly densely populated urban/metropolitan area. The Editor, with the permission of the original Author, has attempted to make this excellent information more universal in nature, so that it can be applied to more suburban/rural operations as well. This edited version of the manual describes, in general terms, what should ideally happen in any NWS/SKYWARN operation . . . anywhere. It should not be viewed as an "etched-in-stone" plan; one that will work anywhere. Basics are Basics, and that is what should be viewed as important.

## **Forward and Dedication**

(1993)

This manual is dedicated to the SKYWARN volunteers who spend many hours in training classes to be ready to participate in SKYWARN severe weather nets in Amateur Radio's finest

public service tradition. The SKYWARN system works ONLY because the volunteers make it work. It takes real dedication to drop whatever you are doing to participate in a SKYWARN Net, which may last for one hour or for many days.

This manual is also dedicated to the National Weather Service (NWS). Nationally, there is a growing respect for the hours of training and dedication each NWS staff member takes to fulfill the NWS mission of saving lives and property through the issuance of timely and accurate watches and warnings. Despite all the technology, the forecasting of weather is still an art and we are very fortunate to have such talented and dedicated forecasters in NWS Forecast centers across the country.

This manual will never be finished! Each SKYWARN activation provides new challenges. No two activations are the same. The goal is to take the lessons learned and effectively integrate them into the SKYWARN system to be in the best possible position to be ready for "the next one", which always comes!

Daniel R. Gropper, KC4OCG

SKYWARN Amateur Radio

Operations Coordinator

May, 1993

## **Forward and Dedication**

(1996)

It is hard to believe that it has been almost three years since the original SKYWARN Operations Manual was prepared and distributed.

Since that time the program has been awarded a U.S. Department of Commerce Public Service award by Dr. Joe Friday, the Director of the National Weather Service, which was reported in the American Radio Relay League's national QST magazine. We have lived through record setting weather events from hurricanes and floods to blizzards and we have seen the Internet become a major source of weather information with many forecast offices and the National Weather Service headquarters having their own home pages.

We are pleased that the organizational and operational structure setup in 1993 has proven itself time and time again around the country. We have proven, Nation wide, that trained volunteer severe weather spotters can reliably observe and report the occurrence of severe weather to the National Weather Service in an accurate and timely manner.

The goal of this second edition of the SKYWARN manual is to update procedures with lessons learned and to incorporate information about weather on the Internet. A number of the scripts have also been updated and hopefully improved!

Daniel R. Gropper, KC4OCG

SKYWARN Amateur Radio

Training Coordinator

June, 1996

This manual was, and is, intended to be a starting point, . . . it is an educational and planning reference guide. The information, structures, and ideas in this manual have been tested and they work. Some of the information contained is basic and universal. Some of the specific features described hereafter, may or may not work as presented in your particular circumstance and locale.

*Perhaps the greatest value of this entire manual is to introduce and reinforce the idea that a definite plan and structure needs to be in place for emergency situations; regardless of where you are or what the emergency might be.*

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# **SKYWARN NET CONTROL OPERATIONS MANUAL**

## **I. INTRODUCTION and ORGANIZATION**

### **1.1 Purpose of This Manual**

This manual is designed to be used as a National reference guide for SKYWARN Net Operation in jurisdictions of the National Weather Service (NWS).

Training cannot, and should not, take place "on the job" during severe weather. Proper training is essential for the effective flow of information between SKYWARN spotters and the NWS and/or emergency management personnel. This includes training for spotters as well as net control volunteers. To be effective, everyone in the SKYWARN "system" needs to know their roles BEFORE severe weather strikes.

### **1.2 Purpose of SKYWARN**

SKYWARN is the NWS national program of trained volunteer severe weather spotters. SKYWARN volunteers support their local community and government by providing the NWS with timely and accurate severe weather reports. These reports, when integrated with modern NWS technology, are used to inform communities of the proper actions to take as severe weather threatens. SKYWARN, formed in the early 1970's, has historically provided critical severe weather information to the NWS in time to get appropriate warnings issued. Thus the key focus of the SKYWARN program is to save lives and property through the use of the observations and reports of trained volunteers.

Each NWS forecast office runs its own SKYWARN program. It is a goal and a challenge to continually improve the SKYWARN system and to integrate new technologies and procedures to best fulfill SKYWARN's mission of saving lives and property.

### **1.3 Role of Amateur Radio in SKYWARN**

Amateur radio has been, and always will be, a critical component of the SKYWARN program. Throughout the Nation, we are extremely fortunate to have hundreds of trained SKYWARN spotters who are also amateur radio operators. This dual role for amateur radio operators is a natural result of their inherent interest and fascination with natural and scientific phenomena (especially the weather!) and with cutting edge technology such as Doppler radar and lightning

detection devices. When this fascination is combined with the ability and desire to be trained to communicate severe weather observations via amateur radio in a professional and effective manner, the synergy is hard to duplicate. Finally, amateur radio operators have a long history of using their training, skills and equipment in uncompensated public service to help the community at large, which is precisely the focus of the SKYWARN system.

The SKYWARN Amateur Radio Programs use mostly donated equipment that is maintained by amateur radio operators; who volunteer their time and expertise. In addition to being an extremely usable and reliable station, the SKYWARN Amateur Radio Station, located in a forecast office, provides a visible and professional focal point for the importance of amateur radio to the NWS, even when SKYWARN is not activated. This is extremely important as the NWS annually receives many thousands of visitors at the forecast office, from elementary school students through high ranking government officials and emergency managers.

The close working relationship between the NWS and the amateur radio community provides many special benefits to each group. These benefits are highlighted in the following goals for the SKYWARN Amateur Radio Net:

1. To provide the NWS with timely and accurate severe weather reports via amateur radio. This includes both incoming reports of severe weather per the NWS criteria and amateur radio operators making observations at specific locations in response to a NWS request. For example, amateurs have often been asked to monitor river and creek flooding situations at certain critical points.
2. To create and maintain an organized communication network for passing critical severe weather traffic, in a timely fashion, to and from the NWS in the event that normal communications have been interrupted. NWS centers have lost normal communications services in the past and it is likely that the SKYWARN Amateur Radio Nets will be activated in future communications emergencies.

In nearly all areas the NWS has regularly experienced an overloaded telephone network during storms. This is probably due to the huge number of people using telephone modems and fax machines to communicate from home during storms. While the telephone system may not be "down", it may take 30 minutes or more to telephone the forecast office. At these peak usage times, amateur radio plays a critical role in relaying severe weather observations to the forecast office.

3. To disseminate warnings and special weather statements issued by the NWS to the amateur radio community. Every attempt is made to read special and severe weather statements issued by the NWS over the SKYWARN Net to keep amateurs informed of developing situations and to prepare for situations when normal communications channels fail.

4. To organize and train amateur radio operators to prepare themselves and their families for disaster or emergency weather related situations; so that they may be available to assist in emergency net operations. This preparedness training is critical if the SKYWARN system is to be expected to operate reliably during true emergency situations.

## **1.4 Organizational Structure of SKYWARN**

SKYWARN is NOT a club. It is a true volunteer public service whose membership is open to all who wish to participate. All reports of severe weather through the SKYWARN system are appreciated. Scripts have been set up and included here to outline the NWS criteria for severe weather on which observations are requested; so that untrained observers may participate. Despite the scripts, all net participants are strongly encouraged to take advantage of the excellent, interesting, and free training provided by the NWS covering subject matter from basic SKYWARN training to specialized courses in winter storms and hurricanes.

## **1.5 SKYWARN's Relationship to ARRL/ARES/RACES/REACT**

The Amateur Radio operator's participation in the SKYWARN program is formally acknowledged and encouraged in a Memorandum of Understanding (MOU) between the American Radio Relay League (ARRL) and the NWS. This agreement indicates that the ARRL will encourage its local volunteer groups operating as the Amateur Radio Emergency Services (ARES), to provide the NWS with spotters and communicators as requested by the NWS during times of severe weather.

Many civil disasters are a direct result of severe weather and/or are exacerbated by severe weather. Accordingly, the NWS may utilize the SKYWARN amateur radio operators not only to obtain and disseminate severe weather observations, but may also use the amateur radio operators to maintain close coordination with Emergency Managers under Amateur Radio Emergency Services (ARES) and Radio Amateur Civil Emergency Service (RACES) guidelines. The importance of this additional role for SKYWARN was demonstrated during Hurricane I.E. Zelda, a training exercise in March of 1992, in which an extremely strong (all paper) hurricane devastated a huge portion of Virginia and Maryland, and with direct event parallels during the actual Hurricane Andrew, an extremely powerful hurricane that devastated parts of Florida and Louisiana during August 1992.

In many areas of the country, ARES and RACES operate as one organization. In others, ARES and RACES organizations are separate and apart; but work in close coordination with each other.

Radio Emergency Associated Communications Teams (REACT) also support SKYWARN. A Memorandum of Understanding also exists between the NWS and REACT. REACT nets may

take reports of severe weather and relay them to the NWS either by normal communications modes (phone, FAX etc.) or by linking up with a REACT member who is also an amateur radio operator; who can relay the severe weather information to SKYWARN Net Control through the SKYWARN amateur radio frequencies. Although it may take some creativity and organization, the goal is to include all groups in the SKYWARN system who wish to participate. The REACT interface has worked effectively and has received many reports from travelers passing through the area.

## **1.5.1 Federal Communications Commission, Part 97 and SKYWARN and NOAA Weather Radio Alerts**

On July 28, 1993 the Federal Communications Commission issued a Report and Order based on PR Docket 92-136, which revised Amateur Radio Rule 97 C.F.R. 113, which governs "prohibited transmissions" on amateur radio frequencies. The Report and Order is Appendix 11.21 to this manual.

This rule change has two major effects on the use of amateur radio in the SKYWARN program. First, in the Report and Order, the FCC specifically permits the use of amateur radio, "...to collect data for the National Weather Service." Before this explicit statement there was a great deal of discussion over whether SKYWARN type activities were a permissible amateur radio activity.

Second, 97.113 (e) permits the retransmission of, "...weather forecast information intended for use by the general public and originated from the United States Government stations", on an intermittent basis, on amateur radio frequencies. This has permitted amateurs to link NOAA Weather Radio directly to amateur radio repeaters.

This feature has proven to be a great enhancement in activating SKYWARN. Most SKYWARN participants learn of SKYWARN's activation through the issuance of warnings on NOAA Weather Radio. In some areas, we have successfully integrated the NOAA Weather Radio alert tone into a number of local repeaters. Another system can also give amateurs DTMF (touch tone) access to live NOAA Weather Radio rebroadcast through repeaters.

The NWS also announces, in most areas over NOAA Weather Radio, that SKYWARN has been activated. This announcement can also be followed by the local amateur radio frequency that is to be used. Where used, these announcements have significantly improved net participation.

We have been told that this system has not only alerted SKYWARN participants of the weather situation, but has also warned boaters and motorists listening to scanners, of deteriorating weather conditions. In many instances, this simple early warning of an upcoming storm was enough to get people to seek safe shelter. Thus, we have made great communications strides in not only linking the NWS to amateur radio during severe weather, but in providing a valuable and potentially life saving public service.

## **1.5.2 SKYWARN Advisory Committee**

With the modernization and restructuring of the NWS, many offices now face the challenges of multi-state coordination. The objective is to set up a system that is transparent to jurisdictional boundaries and uniformly operates across the entire SKYWARN area of responsibility. To achieve this goal, the NWS can, and has, often formed a SKYWARN advisory committee comprised of representatives from ARES, RACES and REACT in multiple states. The outline of a typical advisory committee's goals and functions is Appendix 11.16 to this manual.

These advisory committees have worked better than anticipated! Committees typically meet once per quarter at the NWS forecast office. There is an effort to limit the meeting length to 1 1/2 hours and they generally meet on a Saturday morning. An agenda for the current meeting and minutes for the previous meeting are mailed to the advisory committee representatives about a week before each meeting. The meeting is run by the Warning Coordination Meteorologist. The Training Coordinator brings the donuts and soda! (Critical job!!) These features keep the meetings short and focused.

The included and revised scripts are a direct result of discussions between the coordinators. The input and interaction of the representatives from each of the served states and groups, (ARES, RACES, REACT) in each area, has helped to solve operational problems, confirm things that went well during an activation, and highlight areas which need improvement. Many new subnets and repeaters have been seamlessly added to the SKYWARN system as a result of club and trustee representatives participating in the coordinating meetings. Perhaps, most importantly, these meetings have served to bring key SKYWARN people together on a regular basis which has greatly enhanced system-wide cohesiveness. Overall, the coordinating committee has been one of the most successful innovations of the SKYWARN system.

## **1.5.3 RED CROSS WINTER 4 WHEEL DRIVE PROGRAM**

During emergency situations (usually winter storms), the Red Cross may activate its volunteer 4 wheel drive program for essential personnel. If necessary, SKYWARN net control volunteers may ask the Red Cross for a 4 wheel drive ride to the NWS.

Many times the 4 wheel volunteer is an amateur radio operator who will ask for weather guidance from the NWS forecasters through the SKYWARN net and may report impassable roads to the net.

## **1.6 Role of SKYWARN Master Net Control**

DEFINITIONS: Throughout the rest of this document, the term "SKYWARN Master Net Control" or "MNCS", will be a reference to the NCS located at the NWS Forecast Center.

The SKYWARN Master Net Control Station plays a critical role in any SKYWARN activation. It is a role that will always challenge all of an amateur radio operator's communications and technical skills. It is also an extremely responsible role in that the safety of lives and property may rest on the amateur's skills. Although this role is challenging, with proper training and experience, this role can also be extremely rewarding when a job is successfully completed

This may be a good time to clear up something that can be confusing. In areas of high population density, the Skywarn Master Net Control may be located at the NWS and may be the only NCS. Another likely scenario, especially in less populated areas, is that there will be several Net Control Stations running SKYWARN nets in different and widely scattered locations and on different frequencies/repeaters. There may or may not be a MNCS in operation. These scattered nets, (or Sub-Nets) will, or should, be reporting only priority observations to the NWS. by telephone or other means. Where possible, it is desirable to use a "Hub", or District, NCS on a wide coverage repeater. The various county sub-nets would report only priority observations to the District net; which would then notify the NWS. This avoids a lot of duplicate calls reaching the NWS.

When the above District system is utilized and there is a MNCS activated at the NWS, this system allows the MNCS or Net Liason to have better control of the "Big Picture." By dealing only with priority reports of truly significant events as reported by the Sub-Nets and/or independent nets, the reporting process becomes more effective through a narrowed span of controlled communication. It is far easier to direct three to ten contacts, all with meaningful and properly filtered information, than it is to deal directly with 500 or more individual spotters.

It is the purpose of this manual to provide a framework for SKYWARN Net Control operations. The skill levels and operations are the same for MNCS, and Sub-Net Controls. While consistency of procedures from net to net is important, no two SKYWARN activations will be exactly the same. Therefore, the net control operator has the authority and responsibility to do everything necessary, within FCC rules, to ensure that the SKYWARN mission is performed to the best of his or her abilities.

It is essential that SKYWARN net control operators be familiar with the operation of, (and be operating from) a properly equipped SKYWARN Amateur Radio Station, and have knowledge of NWS procedures, to be able to do an effective job.

We have found from experience that each Net Control shift, which can be, and usually is, run from the Amateur's house, should be about 45 minutes in length. It is important to designate a "scheduler" for each event. Trained net control personnel should check in on the net with the scheduler and get a shift. We have found that this lets many people serve and get experience as a net control station. Additionally, more people are willing to commit for 45 minute shift at a certain time than for an "all afternoon" shift. This scheduling procedure has enabled SKYWARN nets to run for 35 continuous hours without burning out net control personnel.

## **1.7.1 SKYWARN Management**

Each forecast office will organize its' SKYWARN program to best meet its' own needs and to best utilize available NWS and volunteer personnel. In some areas, the NWS does not become very involved with the actual amateur radio communications processes and operations. In other areas, the relationship between the amateurs and the NWS is more tightly woven.

Regardless of the relationship, it is important that your local program is organized to provide the most service with the least bureaucracy!

### **SKYWARN Program Manager:**

Usually, the SKYWARN Program Manager is the Warning Coordination Meteorologist. Whoever it is, it is important to have at least two NWS personnel involved in the SKYWARN program management to provide "institutional memory" and continuity should a NWS staff member get transferred to another office, which is a common occurrence.

### **SKYWARN Amateur Radio Coordinator:**

On the amateur side, the SKYWARN Amateur Radio Coordinator is chosen by the NWS SKYWARN Program Manager as the point person with whom the SKYWARN Program Manager coordinates SKYWARN activities. . In some areas, the NWS may take a lesser role in selection of the Amateur Radio Coordinator; leaving the choice more in the hands of, say, an ARRL Section Emergency Coordinator, to make the appointment.

Irregardless of how the appointment is made, the SKYWARN Amateur Radio Coordinator position is a volunteer position, and it is a critical position for the Amateur Radio side of the SKYWARN equation. It is a matter of some importance that the Amateur Radio Coordinator and his assistant coordinators be able to physically get to the NWS Forecast Center in a relatively short period of time

People listen to what the SKYWARN Amateur Radio Coordinator says, and treat this information as official information from the NWS. Accordingly, it is critically important for the SKYWARN Amateur Radio Coordinator to be extremely careful in what he or she says and how he or she acts as poor judgment will reflect poorly on both the amateur radio community and on the NWS. Additionally, the SKYWARN Amateur Radio Coordinator must be politically savvy and do his or her best to keep the NWS out of amateur radio local disagreements.

One of the most important roles of the SKYWARN Amateur Radio Coordinator is to choose and train his or her possible replacements, almost from the first day he or she is on the job. It takes

about a year of actual experience on the job as an assistant coordinator to gain the skills necessary to take on the coordinator's job.

It is a stated goal to rotate coordinators about every two years. This keeps give the program new management blood and avoids the burn-out of the coordinator.

## **SKYWARN Amateur Radio Training Coordinator:**

A well organized SKYWARN program will include the position of SKYWARN Amateur Radio Training Coordinator. This position is held by someone who is experienced in the operation of the SKYWARN program and can conduct classes in net control procedure and can write and update manuals (like this one) and scripts and acts as an overall trouble shooter. It is highly recommended that a net control training and certification program be established by the Training Coordinator.

## **SKYWARN Assistant Coordinators:**

It is a good idea to have about three other assistant coordinators who will run the net when the main coordinator is unavailable and will generally act as leaders when things need to be done.

The Amateur Radio Coordinator, the training coordinator and the three assistant coordinators are ideally all on a group paging system. One telephone call from the NWS sets off five pagers. The Amateur Radio Coordinator calls the NWS and the other four check in on the main SKYWARN repeater. Should the Amateur Radio Coordinator not check in to the main repeater, one of the assistant coordinators will call the NWS. This system gives organization, efficiency and redundancy to activations and has worked extremely well and professionally.

## **SKYWARN Scheduling Net Control Stations:**

It is recommended that you also have two scheduling net control stations who assign net control slots (usually 45 minutes in length). This is a critical position in long activations

### **1.7.1 Role of the SKYWARN Amateur Radio Coordinator**

The SKYWARN Amateur Radio Coordinator, as assisted by the Amateur Radio Training Coordinator, and Assistant Coordinators, organizes the operation of the entire SKYWARN Amateur Radio Net (Master and Sub-Nets) to ensure operation in accordance with the goals of the NWS. Specific duties of the SKYWARN Amateur Radio Coordinator include, but are not limited to:

1. Ensuring that at least two SKYWARN net liaisons go the forecast office when requested by the NWS.

Net liaisons are experienced amateur radio operators who go to the NWS forecast office, pull the important severe weather information from the SKYWARN net and give it to the forecasters and get updated weather information and warnings from the forecasters and place this information on the main net, and on the subnets. The liaison also coordinates directly with the subnets as necessary. Liaisons should be relieved and replaced every 3-4 hours.

Assistant Coordinators often serve as Net Liasons in NWS centers where space is limited. Where this is necessary, be careful of not over-scheduling personnel in terms of consecutive hours served.

2. Creating and updating a set of recommended protocols and an operating manual for net operation.
3. Coordinating simple, effective and efficient procedures for passing traffic between local weather nets, SKYWARN Sub-Nets, the MNCS, and the NWS forecasters.
4. Sharing information, ideas, and protocols with other SKYWARN programs throughout the country to develop the best possible local SKYWARN program.

Many SKYWARN programs and ARES groups have home pages on the Internet. This has made the exchange of information between groups more efficient. In fact, parts of this manual are on the internet for this very reason! (All of the National Edition)

5. Coordinating the activities of SKYWARN with ARES, RACES, REACT, and other governmental agencies to best fulfill SKYWARN's goals

The position description of the SKYWARN Amateur Radio Coordinator, as formalized by the NWS, is Appendix 11.17 to this manual. This volunteer position is usually appointed by the NWS SKYWARN Program Manager to ensure that the person chosen can work well with the NWS forecasters and management and to ensure some stability in the position. The person chosen for this position must maintain at least a general class amateur radio license, possess superior coordination and communication skills and should be readily available to the NWS.

The SKYWARN Amateur Radio Coordinator is also responsible for making sure that at least one "coordinator" is on duty at all times to receive the NWS page and to bring up the net as requested by the NWS. This will often involve passing the SKYWARN pagers, activation instructions and trained net control volunteer lists from coordinator to coordinator when an out of town trip is expected. It is imperative that the "SKYWARN Amateur Radio Coordinator" position be covered at ALL TIMES!

Group paging systems have been successfully utilized to activate SKYWARN coordination teams. The NWS dials one phone number and enters a code which sets off five pagers held by the Amateur Radio Coordinator and his/her four assistants.

Pager Note: Where pagers are used to activate entire local groups, be sure that there are enough pagers for all members of the group. Failure to ensure that all members have a working pager can initiate a subtle resentment and develop some very negative reactions within your group. Have more pagers available than you really need. Be sure that no one is left out. If you can't issue a pager to all present members and all new members, don't use them.

## **II. ACTIVATION of SKYWARN AMATEUR RADIO NET**

### **2.1 NWS Decision to Activate SKYWARN**

The NWS Forecast Offices have the option to activate SKYWARN when severe weather is expected to affect its area of warning responsibility. SKYWARN can be activated in many ways and is activated for many forms of anticipated severe weather including tornadoes, severe thunderstorms, hurricanes, floods, and severe winter storms.

In some coverage areas a formal activation only through the established "chain of command" is the preferred method. In areas of wide or rural coverage, the NWS may simply include a SKYWARN activation notice in their broadcast watches and warnings. In yet other areas, the NWS and the Amateur Radio Community may go to pre-agreed states of readiness and activation automatically with the issuance of a watch or warning (with no accompanying activation statement) from the NWS.

### **2.2 Activation Time Frames and Requested Staffing**

For short lead time events (i.e. severe thunderstorms, tornadoes, and flash floods), SKYWARN is activated when the WATCH is issued. The lead time may vary from zero (0) to six (6) hours. Thunderstorms often change rapidly and are life-threatening situations. Net control volunteers are always requested to staff the SKYWARN Amateur Radio Station at NWS centers during thunderstorms and during other similar fast moving and rapidly changing weather situations. The SKYWARN net will usually remain activated for three to twelve hours for short term events

During long lead time severe weather events, such as hurricanes, stream and river flooding, and winter storms, SKYWARN is activated when the WARNING is issued. Lead time may be anywhere from zero (0) to twelve (12) hours. Requests to staff the SKYWARN Amateur Radio Station will depend on the forecaster's assessment of the nature of the storm and the storm's

potential to cause wide-spread communication outages. Long-term events may cause SKYWARN to be activated for extended periods of time, possibly measured in days. See Section 3.1.4 Preparations for Extended Activation. Severe winter storms (blizzards!) in March 1993 and January 1996 caused some SKYWARN organizations to be activated for more than 30 continuous hours.

## **2.3 NWS SKYWARN Net Activation Steps BY NWS FORECASTERS**

### **WHEN TO ACTIVATE:**

It is the lead forecaster's responsibility to see that SKYWARN is ACTIVATED whenever a WATCH or WARNING affects the NWS county warning area of responsibility (covering 2 or more counties), OR he/she feels that a critical weather situation is developing that threatens life and/or property and SKYWARN reports are needed (i.e. flood, hurricane, winter storm, etc.)

**IMPORTANT:** New ARES/RACES groups are often under the mistaken impression that they cannot start a *weather related net* unless the NWS has issued a formal Watch or Warning statement. **WRONG!!** If the weather is threatening and you feel that a weather net would be a good idea, **START ONE!!** Don't call it a SKYWARN net. In most cases, a net does not gain identity as a SKYWARN event until the NWS issues a public watch or warning statement. (Some NWS offices are fussy about using the word.) Call it a Standby weather net or whatever.

NWS radar can't see everything. Call the NWS, inform them that you have threatening local conditions and that you have activated a weather net. It may be their first indication that something is getting serious in a particular locale. The NWS is not obligated to activate their in-house MNCS because of your local activation. If they don't activate it, use the telephone. Hams are so accustomed to using their radios that they often forget the value of a working telephone.

### **HOW TO ACTIVATE:**

#### **1. TYPICAL NORMAL ACTIVATION STEPS**

- A. CALL (\_\_\_\_) \_\_\_\_-\_\_\_\_\_
- B. At the beep, punch in \_\_\_\_\*\_\_\_\_\*\_\_\_\_\*\_\_\_\_\_(NWS telephone number)
- C. SKYWARN Net Manager will call in on phone for briefing

## 2. TYPICAL "BRING UP NET IMMEDIATELY!!" STEPS

- A. CALL (\_\_\_\_) \_\_\_\_-\_\_\_\_\_
- B. At the beep, punch in \_\_\_\_\*\_\_\_\_\*\_\_\_\_\_(NWS telephone number)
- C. Turn on radio 1 to memory 1 (000.000 mhz) and listen to net
- D. SKYWARN Net Manager will call in on telephone for briefing

This is used when the NWS has an emergency situation i.e.. a thunderstorm that is suddenly causing damage or is spawning tornadoes before the net has been activated.

### 3. If the pagers are not working, try calling the SKYWARN Net Managers using a "calling tree" system:

Net Managers: (on the group pager system)

Home Tel Work Tel.

Group Wide Page!

241 Dan

242 Jorge

243 Lisa

244 Tom and Margaret

245 Ross

246 Bernie

Once NWS forecasters have made the decision to activate SKYWARN, the following action steps are taken by the forecasters:

***NOTE: ONLY NWS FORECASTERS CAN MAKE THE DECISION TO ACTIVATE SKYWARN!!***

Until the forecasters announce that decision, any weather net you may start at a local level should only be referred to as a "Local Weather Net." Only at that time should you then say that you are part of a SKYWARN activation

1. A message stating that "SKYWARN HAS BEEN ACTIVATED. PRIMARY AMATEUR RADIO NET ON \_\_\_\_\_.\_\_\_\_\_ MEGA HERTZ" should be placed on NOAA Weather Radio.

Nationwide, NOAA Weather Radio is commonly transmitted from one or more of the following frequencies:

- 162.550 MHz
  - 162.475 MHz
  - 162.400 MHz
2. This message alerts all SKYWARN spotters to be on the lookout for severe weather and to be ready to pass reports to NWS by phone if the formal net is not in operation. Most of the watches and warnings that cause SKYWARN to be activated are tone-alerted and will activate weather alert radios. SKYWARN participants are encouraged to obtain radios with this feature. The tone alert feature is tested each Wednesday between 11AM and Noon by the NWS. Please make sure that your tone alert is functioning properly!

**NOTE:** NOAA weather radio can also be used to notify the amateur radio community of a change of repeaters.

## **2.4 SKYWARN Amateur Radio Coordinator Activation Steps**

### **TYPICAL EXAMPLE STEPS:**

1. The SKYWARN Amateur Radio Coordinator, or his/her designate, receives the page and calls the NWS at the telephone number on the pager.
2. The SKYWARN Amateur Radio Coordinator is briefed by the forecaster on:
  - Nature of expected severe weather
  - Expected onset of severe weather (immediate or later in day)
  - Expected duration of event; and,
  - Are there any special communication needs (such as HF radio).
3. The SKYWARN Amateur Radio Coordinator asks the forecaster:
  - To turn on radio number 1 to memory channel number 1 (147.300) to enable NWS to immediately listen to the net; and,
  - To ask if the "SKYWARN HAS BEEN ACTIVATED" message has been placed on NOAA weather radio.

4. If necessary, the SKYWARN Amateur Radio Coordinator arranges to bring up the net IMMEDIATELY from remote sites such as a house or a car.
5. The SKYWARN Amateur Radio Coordinator assesses the situation and takes the following steps:
  - Contacts amateur radio net liaisons to staff the SKYWARN Amateur Radio Station at the NWS  
  
\*\*NOTE: Staffing should be in shifts of two (2) or three (3) people with new personnel rotated approximately every three to four (3-4) hours.
  - The SKYWARN Amateur Radio Coordinator alerts sub-nets by calling designated liaisons.
  - The SKYWARN Amateur Radio Coordinator puts 147.300 MHz (WA4TSC Bluemont, VA repeater) into "Weather Alert" mode immediately to tell listeners that a net is coming up and severe weather is expected.
  - Code: \_\_\_\_\_  
  
\*\*NOTE: This code is CONFIDENTIAL!
6. The SKYWARN Amateur Radio Coordinator monitors the net and periodically checks with forecasters to track the progress of the storm and makes adjustments in staffing of the SKYWARN Amateur Radio Station as required.

### **2.4.1 Net Control Operator Personnel List**

The SKYWARN Amateur Radio Coordinator will prepare and continually update a list of Net Control operators certified to run a SKYWARN net (both from the NWS and remotely). The goal is have about 100 Certified Net Control operators on the list, many of whom are likely to be available in the afternoons to cover SKYWARN activations for thunderstorms. The SKYWARN Amateur Radio Coordinator must be able to contact Net Control operators at any time and should have the amateur's home phone, work phone, car phone, FAX, and pager numbers

### **2.4.2 NWS Communication Emergency Procedure**

If the telephones are NOT working and there is an IMMEDIATE DANGER TO LIFE AND PROPERTY (i.e. tornado, very severe thunderstorm) and there is NO time to find another telephone:

- Turn on Amateur Radio to the dedicated frequency
- Press the button on the microphone and say

"THIS IS NWS CITY, STATE. WE HAVE A COMMUNICATIONS PROBLEM. CAN SOMEONE CONTACT KD4DGQ OR KC4OCG AND HAVE THEM CONTACT US ON THIS FREQUENCY?

(or possibly);

CAN SOMEONE TEMPORARILY START UP THE SKYWARN NET? WE HAVE THE FOLLOWING SITUATION (READ WATCH OR WARNING)

### **IT IS LEGAL TO DO THE ABOVE ACTIVITY!!!**

(Authority: 47 Code of Fed. Reg. (CFR) 97.403):

*"SAFETY OF LIFE AND PROTECTION OF PROPERTY"*

*"No provision of these rules (part 97 amateur radio rules) prevents the use by an amateur station of any means of radio communication at its disposal to provide essential communication needs in connection with the immediate safety of human life and immediate protection of property when normal communication systems are not available."*

This last emergency procedure has become more important with the telephone system getting increasingly overloaded. This procedure was put in place after the NWS communication system at one Forecast Office was severed when a contractor cut a fiber optics cable nearby.

It has only been used once that we know of; where tornadoes were touching down and causing damage and injury and the NWS telephone system was overloaded with spotter and media calls and an eyewitness to a funnel cloud touching down was calling the NWS on amateur radio to report a funnel cloud location and direction of movement.

This procedure is to only be used in emergencies, which may need to be justified, as above, but it is an important backup communication resource should normal NWS communication systems fail or become overloaded.

## **III. NET CONTROL OPERATOR PROCEDURES**

### **3.1 Behavioral Rules**

#### **3.1.1 Do Not Bring Children With You**

The NWS Forecast Office is NOT the place for children or sightseers during emergencies. The NWS operations area is not large and is filled with expensive and delicate equipment. Please DO

NOT bring people to the NWS who will distract you or the NWS from doing the best possible job. The NWS would be pleased to give your family a tour of the NWS facility at a quiet weather time and upon prior arrangement.

The same basic rules apply to running a Sub-Net from your home. Distractions in any NCS could result in death or injury. Do not be afraid to say "No" to a NCS assignment if you cannot avoid distractions. Perhaps you can eliminate the source of distractions and join as a relief operator later on. If unavoidable and unexpected distractions should arise while you are acting as NCS, ask for relief immediately!

### **3.1.2 NWS Forecast Office Operating Conditions**

When SKYWARN is activated the NWS is usually operating in a high tension and critical weather mode due to weather conditions. This means:

1. Any distractions or interruptions of NWS or SKYWARN operations may mean the loss of life or property.
2. Sensitive information such as severe damage or loss of life may be openly discussed and should not be repeated by SKYWARN volunteers outside the NWS.
3. TV and/or news crews may be present in the forecast office. Please remember, if you are asked to give a statement, that you represent the entire amateur radio community. Please think before you speak! Words are hard to retract! It is best to decline to give a statement at all. "I don't know." is always a good answer. Leave comments to the Public Information Officials.

### **3.1.3 No More Than Three (3) Volunteers at the SKYWARN Amateur Radio Station at One Time**

In most instances, no more than three (3) SKYWARN volunteers should be in the forecast office at one time. If, for some reason, there are more than (3) volunteers at the NWS, please take shifts. Off-duty Amateurs may monitor other nets from the NWS lunch room or from their cars in the parking lot. Feel free to establish a simplex radio link to the SKYWARN Amateur Radio Station.

### **3.1.4 Preparations for Extended Activation**

SKYWARN amateur radio volunteers should be prepared for an extended stay at the NWS if SKYWARN is activated for a hurricane or for severe winter long-duration storms. Volunteers are responsible for bringing food, medications and personal hygiene supplies to maintain themselves for the duration of their stay at the NWS. Please be prepared to be as self sufficient as possible

The following "NWS Survival Hints" were written by George KD4DGQ shortly after arrival home from serving as Net Control at the NWS for a thirty two (32) hour duration during the Blizzard of '93 on March 13-14, 1993

### **I. FOOD (to be placed in one cooler and/or one paper bag)**

- No stove is available. Only take food that can be eaten cold or microwaved.
- Although the NWS has a refrigerator, do not count on space being available. Bring a cooler with two or three reusable freezer packs to be refrozen as necessary.
- Bring change for the soda machine.
- Keep meals simple as time and facilities will be in short supply. Suggest cold sandwiches (i.e. peanut butter and jelly); cold vegetables, fruits, cookies and snacks and your favorite beverage.
- Hard candies (for sore throats)
- Canned soup
- All cooking and eating implements (cup, plate, bowl, knife, fork, spoon, can opener)

### **II. SLEEPING ACCOMMODATIONS and CLOTHING (one duffel bag)**

- Sleeping bag with mattress pad and a REAL pillow.
- Blanket (it may be cold!) or Fan (it may be hot!)
- Enough shirts, socks and underwear for the time you expect to be there, plus a few more things, just in case!
- Comfortable pants, you will be sitting for a long time. (Loose fitting or sweat pants will work best)
- Comfortable inside shoes.
- Alarm Clock to get you up for your next shift.

- Toilet kit and medications for your stay (plus a little more just in case!) Razor, comb, toothbrush and toothpaste, motel size soap, towels and cologne (for covering for a few days without showers)
- Packages of facial tissue
- Aspirin or Substitute. You will need it!

### **III. RADIO EQUIPMENT and GENERAL GEAR (one backpack)**

- Handietalkie and dry cell battery pack and batteries.
- Speakermike.
- Earphone (small and lightweight).
- Your own SKYWARN book with scripts, frequency charts, repeater lists that you are used to using.
- Pen and Pencils and legal pad with hard back or clip board.
- AM/FM Battery Radio with earphone

## **• 3.1.5 How To Volunteer for Net Control Duty**

DO NOT GO RUNNING TO THE NWS OR CALL THE NWS AT THE FIRST SIGN OF BAD WEATHER. To be a well coordinated and effective operation we must follow protocol:

1. NWS determines a need for SKYWARN activation and activates the SKYWARN pagers
2. The SKYWARN Amateur Radio Coordinator, or designate, calls the NWS to get briefed by the weather forecasters and to determine their staffing needs.
3. The SKYWARN Amateur Radio Coordinator, or designate, will contact Net Control operators to go to the NWS.

Trained Net Control operators may also contact the SKYWARN Amateur Radio Coordinator, or the net scheduler, to inform of their availability. Please feel free to indicate your availability to Net Control at a quiet time in net operations. Please do not be insulted if your services are not needed at that time. As the weather situation changes, staffing needs may also change.

## **3.1.6 Interaction With The Forecasters**

The forecaster who briefs the Net Liaison operator upon arrival at the NWS will most likely be the contact person until the NWS shift changes. Please follow your instincts on how to pass information to the forecasters. If the information is **CRITICAL** and **POTENTIALLY LIFE**

THREATENING, bring this information to the forecaster IMMEDIATELY. Otherwise you will need to gauge the situation as to whether the information is important enough to bring to the forecaster's attention immediately or if it can wait five or ten minutes until a forecaster comes to the amateur radio station as part of his or her duties. It is a delicate balance to make this critical part of Net Control operation successful and it must be handled with discretion, tact and diplomacy by the Net Liaison operator.

The same may be said of Sub-Net reports to the MNCS. A Sub-NCS should carefully gauge the nature and priority levels of information ready to be passed to MNCS against the severity of whatever the MNCS is handling at any given moment.

### **3.1.7 Handling Non-Severe Weather Reports**

No matter how hard you try to eliminate it, many of the reports received over any SKYWARN net will be for non-severe weather. There is no room for direct criticism of any operator or reporting technique during SKYWARN nets. Please be courteous to the report giver and note the amateur's location as you may need to contact the amateur(s) if the storm moves in their direction. If the problem persists, read the net instructions from your script again; as time permits. As the moment dictates, it may be necessary in periods of extremely severe weather to only take reports from specific areas of interest to the NWS or only reports of severe weather. If the situation arises, please do not be shy about informing net participants of the exact nature of the information needed and that the only report you will take must meet the severe weather criteria. Please indicate when net is reopened for all traffic.

Your net scripts should contain instructions designed to ask participants to refrain from giving non-severe weather traffic on the net.

### **3.1.8 CTSS Deactivation, Event Timers, & Auxillary Power**

Some repeaters are equipped with and utilize CTSS encoding. Arrangements should be made so that CTSS encoding can be disabled during SKYWARN activations. Ideally, the weather net macro would automatically deactivate the CTCSS.

If at all possible, your primary repeater should be backed up by battery power or auxillary generator in the event of commercial power failure. It should have the capability to run for at least to eight (8) hours on the auxillary power source.

Often, SKYWARN nets run on repeaters that are set up on a timer for specific events, like a daily traffic net. Sometimes a macro will automatically change the repeater out of weather net mode and into different mode at a specified time. If such is the case during an ongoing weather situation, the SKYWARN Net Control Station may need to place the repeater back into weather net mode. Be sure that you have the proper codes, instructions, and the authority to use them from the repeater licensee.

SKYWARN is not affiliated with any club or organization. The selection of a primary or secondary repeater should be based on its location and coverage capabilities within the area of responsibility. Coverage of EOC's in a region should also be a consideration and test-verified during communications exercises.

Your planning should also include having designated backup repeaters and simplex frequency operations in the event that your primary fails. These arrangements and local agreements should be in place before an emergency occurs. Such things should not be left to chance. While this manual is primarily concerned with SKYWARN, you should plan for contingencies when it comes to available repeaters and operators. It is not an unusual situation to experience a local incident occurrence which requires ARES/RACES response operations to begin while SKYWARN is still fully operational. You must plan for multi-layered events.

It has been heard from around the country that many times a particular repeater is offered to SKYWARN in an effort to give a sponsoring club some kind of imagined "official" status. Operational capabilities, and not political sponsorship, should be the determining factors in choosing a main repeater and backup repeaters. If SKYWARN is to be successful and open to all participants, it must run without affiliation to any club or organization! This also applies to choosing repeaters!

### **3.1.9 Emergency Broadcast Radio**

If you are working from a NWS Forecast Center that is equipped with an Emergency Broadcast System Transmitter (EBS), DO NOT TOUCH THIS RADIO FOR ANY REASON!!!

The EBS system is being replaced by the Emergency Alerting System (EAS) which is essentially a digital code sent ahead of the NWS alert tone as part of NOAA Weather Radio.

## **3.2 Operating Rules**

### **3.2.1 Access to NWS**

Some NWS centers have security gates which are usually closed at night and on weekends. If the gate is closed, call the NWS on the telephone at ( )-\_\_\_-\_\_\_\_\_ and identify yourself as a SKYWARN volunteer. You will need to wait until a forecaster comes and opens the gate. Park in a marked parking space as designated.

### **3.2.2 Briefing Upon Arrival at the NWS**

Upon arrival at the NWS, immediately identify yourself to the lead forecaster as a SKYWARN amateur radio operator (it helps to wear the SKYWARN T-shirt) and ask the lead forecaster for a briefing on the severe weather situation.

You should get the following information from the forecaster:

1. Where storm(s) are located and in which direction(s) they are traveling. The forecaster will often draw the watch or warning area on the SKYWARN map to help in communication between the SKYWARN volunteer and the NWS forecaster.
2. Characteristics and history of the storm(s) (i.e. hail, damaging winds, tornadoes, snow, etc.);
3. What geographic locations are of primary concern to the forecasters; and,
4. The latest severe and/or special weather statement(s) to be read over the net.

### **3.2.3 Net Liaison Initial Setup**

After receiving the briefing, the Net Liaison operator should take the following steps to bring up the net:

1. Take a deep breath and calm down!
2. Size up the situation and make a plan of attack
3. Get a clipboard with sufficient copies of the correct reporting form (summer or winter).
4. Find pens.
5. Get the Operations Manual with the appropriate scripts.

The NWS is primarily concerned with storm damage reports that meet the official NWS criteria. This information is initially used in issuing warnings and later in storm damage reports and in locating possible tornado touchdowns and damage.

**\*\*NOTE:** The scripts are also part of this manual in Chapter IV.

6. Set up the radio. Usually you will use memory one (1) of radio one (1) which should be set for the primary repeater frequency.
7. The frequencies for the second net should be programmed into radio 2 and the memory locations are identified on the SKYWARN shack map

Take another deep breath, make sure the repeater is in net mode. DTMF Code \_\_\_\_.

**\*\*NOTE:** This code should be considered CONFIDENTIAL.

8. Check in with remote net control. Read any watches and warnings. Pass on briefings from the forecasters to the net. Obtain reports of severe weather and pass them to the forecasters. Read new watches and warnings on the net.

Please date the sheet and WRITE LEGIBLY!

### **3.2.4 Remote Master Net Control Stations**

Very often, Master Net Control Stations will be run on a rotating basis by volunteers located throughout the SKYWARN area of responsibility but physically away from the NWS.

SKYWARN Master Net Control Stations will actually run the net from their homes and offices, from scripts, on a 45 minute rotating basis. They will write down all severe weather information and will make sure that the Net Liaison station at the NWS has received the information. Many times experienced remote net control stations will let the net liaison station speak directly to the observer if there is a critical or complex report.

SKYWARN Net Control stations will also keep a list of all current watches and warnings and will brief the next net control station at the end of each shift.

### **3.3 Closing the SKYWARN Net**

When the severe weather situation calms down, a forecaster will indicate to the Net Liaison volunteer that it is time to secure the net, or parts of the net. At that time the Net Liaison volunteer should perform the following net shutdown steps:

1. Inform the Net Control station(s) of the net, or subnets to be deactivated
2. The Net Control volunteer will make a final call for severe weather reports. At the end of snow storms, the Net Control station should poll various areas within the warning area for a final snow fall report

Upon hearing no further reports of severe weather, the Net Control volunteer should read script 14.12 and thank the repeater licensee and amateur radio community.

3. The Net Control volunteer should place the repeater back into normal operation through DTMF \_\_\_\_\_.

**\*\*NOTE:** This code should be considered CONFIDENTIAL.

4. The Net Control station should indicate to anyone listening on the net that any further reports of severe weather must be telephoned into the NWS. See Script 14.12.
5. Every attempt should be made to contact and thank the subnets for their participation and to inform them of the closing of the primary SKYWARN Net. This is usually done by the Net Liaison station from the NWS. Should contact NOT be made, the backup signal of the primary net's closure is the return of the primary repeater to normal mode ( ie...single courtesy beep instead of "WX" Morse code).

6. The station **MUST** be left in a clean condition **READY** for the next activation. In other words, please make sure that everything is back where it belongs.
7. Please staple all reports and statements together and hand them to the lead forecaster!

The net control volunteer may need to ask the forecasters to make arrangements to open the security gates before driving out to the gate.

### **3.4 SKYWARN SubNet Procedures**

A primary repeater, when used as a MNCS, will seldom cover the entire area of responsibility. Several SKYWARN sub-nets will likely be formed in areas beyond the coverage of the primary repeater. In some cases, the Sub-Net repeater may be out of range of the primary repeater. A SKYWARN sub-net is an official local area net whose goal is to obtain and consolidate reports of severe weather from a specific area and, using primary SKYWARN Net procedures, to relay these severe weather reports to the primary SKYWARN Net. It may be necessary to arrange, as part of your operations planning, to set up designated and dedicated Liason Relay Stations which can access both the primary repeater **AND** the local repeater **SIMULTANEOUSLY**

The following is a brief list of the steps of how a SKYWARN Sub-Net should be organized:

1. The NWS Amateur Radio Coordinator makes a determination that an area does not have an effective hand held coverage into the primary repeater. It has been found that many amateurs (correctly) disconnect outside antennas during lightning storms and revert to hand-held usage.
2. The Amateur Radio Coordinator makes contact with local groups (or visa versa) in the area of interest and makes sure that the proposed Sub-Net fits well into the SKYWARN system. It is preferable that all nets use the same protocols for consistency.

The Sub-Net Liason Relay Station's primary responsibility is to relay priority traffic for the Sub-NCS station that cannot access the primary repeater directly.

The NCS, or the liaison relay station, of each SKYWARN Sub-Net will notify the NWS Net Liaison operator of the activation of the SKYWARN Sub-Net as well as the Net Control operator's and liaison station's call sign and telephone number. This will permit the MNCS/NWS Net Liaison operator to contact the SKYWARN Sub-Net if requested to do so by the NWS.

A SKYWARN Sub-NCS may place the sub-net in standby mode if severe weather is not occurring. However, SKYWARN Sub-NCS should not secure operations until given permission to do so by the NWS forecasters, indicating that the severe storm threat in that area has passed.

To be effective, the participants, and especially the Net Control station in a SKYWARN Sub-Net, should have completed SKYWARN spotter and net control training

Each official SKYWARN sub-net will be given a designator, such as Hagerstown SKYWARN sub-net. Where possible, use a wide area coverage voice repeater to coordinate the main SKYWARN net with the outlying sub-nets. In extreme circumstances where repeater resources are insufficient, it may be necessary to use simplex, SSB or HF networks for liaison relay stations..

A "roving" SKYWARN Net Control operator from the MNCS/NWS Liaison may be assigned to check in and/or monitor the frequencies of the various sub-nets in the areas of severe weather activity to help with coordination.

## 3.5 Remote Net Control

**Remote Net Control Stations** perform the same tasks as the MNCS, follow the same procedures, and carry the same responsibilities. They do the same exact same job as MNCS. The only difference is location and area of responsibility. Remote Net Control Stations can be used on a temporary or long term basis.

Remote Net Control volunteers are trained and experienced in SKYWARN Net Control procedures. The remote Net Control volunteer coordinates with the SKYWARN Amateur Radio Coordinator and runs the net from his or her home or other location. The remote net control volunteer makes notes of all reports of severe weather on the standard reporting forms and passes the severe weather information to the Net Liaison station at the NWS.

It is important to note here that in some rural and suburban NWS jurisdictions, the Amateur Radio Station located at the NWS facility is, quite often, not acting as an active Master Net Control Station. It is acting as the "bucket" below an information funnel. A Centralized Remote Net Control may or may not be used. In either case, the NWS Station is primarily acting as a final reporting point for filtered information from several regional and local Sub-Nets. These Sub-Nets report only priority observations directly to the NWS Station when direct communication is possible. If direct communications are not possible, the Sub-Nets report through preset, predesigned, pre-arranged Liaison Relay Station links. These links, sometimes called "Key Stations", may be in the form of individual strong stations. Key Station communications can also be accomplished through cross-banded or dedicated repeater links.

Remote Net Control stations pass control of the net from one to another as needed, usually on a 45 minute basis per the prearranged schedule. It is important that all severe weather reports be promptly mailed to the NWS for their records.

If a Temporary Remote Net Control station determines that a severe weather report, such as a funnel cloud, needs to be made known to the forecasters IMMEDIATELY, and the NWS Liaison volunteer has not arrived at the NWS, please make sure that the NWS is informed of this priority traffic by telephone.

Remote Net Control operators must use a different introduction to the scripts that indicates that: (1) the remote Net Control station is Not at the NWS, and (2) the remote Net Control station is in contact with the NWS.

During long term duration storms (heavy rain/flooding, snow storms etc.) it is recommended to hold hourly "check-in" activities (usually on the hour) with the SKYWARN Net Control station monitoring the frequency when the net is not in active session. This is an effective way to pick up reports from subnets (which were not relayed during the last formal main net session) and priority or emergency reports that cannot wait until the next formal net session.

## **3.55 Liason Relay Stations and Sub-Nets**

Liason Relay /Sub-Net volunteers are also trained and experienced in SKYWARN Net procedures.

The purpose of a Liason Relay (Key) Station is to fill a communication gap between the NWS and a participating NCS. Liason Stations are nearly always assigned to a particular net. Their specific job is to perform bi-directional relay of priority information and observations at the request of either of two Net Control Stations that are out of each other's range.

### **LOCAL LIASON STATIONS**

The use of Sub-Net Local Liason Stations is to be encouraged if you feel you are in danger of losing control as Local, Sub-Net NCS. When event traffic gets hot and heavy, don't be afraid to ask for a Local Liason station to help out. They can handle telephone calls and other duties for you. As NCS, you will know when it is time to make this request . . . a sense of panic will set in. Putting excited spotters on "hold" while you try to make a difficult contact on a different frequency or make a telephone call to NWS, can really add to everyone's stress levels in a fast moving net.

A Local Liason Station absorbs a lot of duties that can disrupt the smooth operation of a Sub-Net NCS; like making phone calls and handling time consuming minor logistical problems. If the level of disruptive duties continues to grow, NCS should request that a Local Resource or Tactical Support net be formed.

Local Liason Relay Stations usually will not be participating in their own Sub-Net. They will be "lurking" in the background and waiting for either reportable observations or instructions from their Sub-Net NCS. In a very large and wide spread event a Liason Sub-Net could become absolutely necessary. If a Local Liason Station becomes necessary, the operator would become responsible to make notes of all reports of severe weather on the standard reporting forms and pass the severe weather information to the Net Liason Operator/MNCS at the NWS.

Local Liason Relay Stations must have strong receiving and transmitting capabilities with strong signals on used frequencies. The ability to monitor separate frequencies on the same band and/or different bands, is extremely desirable; as is an auxiliary power source. The Liason Station normally operates from his or her home.

## 3.6 Local Weather Nets

The weather is very difficult to predict! Local severe weather, such as flooding or severe thunderstorms, may develop suddenly without the NWS issuing a watch or warning, or be too localized for the NWS to activate a main SKYWARN net.

The following is the recommended procedure for implementing local area weather nets.

The activation of a local area weather net should be coordinated on the local level with the repeater licensee, preferably in advance of the weather emergency. Please do not have multiple local nets or multiple amateurs calling the NWS. To be successful and to serve the NWS in the best possible manner, the program needs to be self policing. Therefore, the structure should be similar to a main SKYWARN net activation where there is one net control station and one assistant (Key Station) to make sure that reportable severe observations are relayed to the forecasters.

Upon receiving reports of a serious local weather situation developing, the Net Control station should contact the NWS lead forecaster by telephone to:

1. Relay the weather information
2. Confirm that the main NWS SKYWARN net is not activated (AFTER having listened to the primary repeater and NOT hearing the repeater in SKYWARN net mode)
3. Receive a request from the lead forecaster that a localized area of severe weather is in your location and that reports are needed. Please give the lead forecaster your name, call sign, and telephone number and indicate that you are the contact person for running a local weather net on a particular frequency in a particular area. The forecasters may wish to listen to the net "live

Please designate the net as a "local area weather net" and not as a SKYWARN Net. This notifies participants that any critical weather information needs to be relayed to the NWS by telephone and not by amateur radio as, most likely, there is no one listening to the Amateur Radio Station at the NWS.

If SKYWARN is activated by the NWS and the MNCS/Liason Station is activated while a local area weather net is in progress, the local area net should declare the activation, become a SKYWARN Sub-Net and where applicable, the Liason Relay Station should be brought on line.

To be effective, the participants in the local area weather net should have completed SKYWARN Basic Spotter Training.

### **3.7 Interfacing with Other Groups**

The NWS is often asked to communicate with other groups in addition to amateur radio operators. Every attempt should be made to have the broadest possible inclusion into the SKYWARN Net. At the present time, there are no facilities to monitor citizens band frequencies at the SKYWARN Amateur Radio Station and no such facilities are planned. Accordingly, if groups such as REACT would like to participate in SKYWARN nets, it is imperative that the group coordinate with one of their members who is also an amateur radio operator who can relay the reports to the primary SKYWARN net.

### **3.8 SWITCHING NET TO ALTERNATE REPEATERS**

From time to time it may be necessary to switch the net to alternate frequencies for technical or other reasons. The procedure is as follows:

1. Verify the net has permission to use the alternate repeater. Permission may be received over the radio if necessary.
2. Make an announcement on NOAA Weather radio of the change in frequencies.
3. Assign a station to remain on the initial frequency (simplex if necessary) to tell stations checking in of the change in frequency.
4. Thank all repeater groups and licensees for the use of the repeater.

# **IV. SKYWARN NET CONTROL SCRIPTS**

## **4.1 SKYWARN Script #1 - SUMMER**

**(GENERAL REQUEST FOR REPORTS)**

READ EVERY 30 MINUTES

THIS IS \_\_\_ (call sign) NET CONTROL FOR SKYWARN IN CONTACT WITH THE NATIONAL WEATHER SERVICE FORECAST OFFICE IN \_\_\_\_\_, \_\_\_\_\_ NEAR \_\_\_\_\_.

WE ARE LOOKING FOR REPORTS OF SEVERE WEATHER INCLUDING:

1. TORNADOES, FUNNEL CLOUDS OR ROTATING WALL CLOUDS
2. HAIL (DIME SIZE OR LARGER)
3. WIND 50 MPH OR GREATER
4. FLOODING
5. RAIN ACCUMULATION IN EXCESS OF 1 INCH OR MORE PER HOUR
6. DAMAGE BY WIND OR LIGHTNING
7. DOWNED TREES OR POWER LINES

PLEASE REFRAIN FROM CALLING SKYWARN IF THERE IS NO SEVERE WEATHER OCCURRING IN YOUR AREA. ANY STATION EXPERIENCING SEVERE WEATHER CALL SKYWARN NET CONTROL AT THIS TIME. THIS IS \_\_\_ (call sign). OVER.

## **4.2 SKYWARN Script #2 - SUMMER:**

**(THANKS FOR USE OF REPEATER)**

READ WITH EVERY 30 minutes

THIS IS \_\_\_ (call sign) NET CONTROL FOR SKYWARN IN CONTACT WITH THE NATIONAL WEATHER SERVICE FORECAST OFFICE \_\_\_\_\_, \_\_\_\_\_, NEAR \_\_\_\_\_.

ON BEHALF OF THE SKYWARN PROGRAM, WE WOULD LIKE TO THANK THE \_\_\_\_\_ REPEATER FOR USE OF THEIR SYSTEM AND THE AMATEUR COMMUNITY FOR GIVING SKYWARN TRAFFIC PRIORITY.

WHEN SKYWARN HAS BEEN ACTIVATED, BUT IS NOT TAKING TRAFFIC, THE REPEATER MAY BE USED BY AMATEURS. IT IS REQUESTED THAT TRANSMISSIONS BE KEPT SHORT AND BREAKS GIVEN TO PERMIT SEVERE WEATHER REPORTS TO REACH SKYWARN.

PLEASE REFRAIN FROM CALLING SKYWARN IF THERE IS NO SEVERE WEATHER OCCURRING IN YOUR AREA. THIS IS \_\_\_ (call sign) NET CONTROL FOR SKYWARN. OVER.

## **4.3 SKYWARN Script #3 - SUMMER**

**STANDBY NET**

**(GENERAL REQUEST FOR REPORTS)**

READ EVERY 30 MINUTES

THIS IS \_\_\_ (call sign) NET CONTROL FOR SKYWARN IN CONTACT WITH THE NATIONAL WEATHER SERVICE FORECAST OFFICE IN \_\_\_\_\_ , \_\_\_\_\_, NEAR \_\_\_\_\_.

SKYWARN IS IN A STAND-BY MODE DUE TO A THREAT OF SEVERE WEATHER. REPORTS OF SEVERE WEATHER WILL BE TAKEN ON THE HOUR AND ON THE HALF HOUR. THE NATIONAL WEATHER SERVICE MAY FULLY ACTIVATE SKYWARN IF SEVERE WEATHER OCCURS.

WE ARE LOOKING FOR REPORTS OF SEVERE WEATHER INCLUDING:

1. TORNADOS, FUNNEL CLOUDS OR ROTATING WALL CLOUDS
2. HAIL (DIME SIZE OR LARGER
3. WIND 50 MPH OR GREATER
4. FLOODING
5. RAIN ACCUMULATION IN EXCESS OF 1 INCH OR MORE PER HOUR
6. DAMAGE BY WIND OR LIGHTNING
7. DOWNED TREES OR POWER LINES

PLEASE REFRAIN FROM CALLING SKYWARN IF THERE IS NO SEVERE WEATHER OCCURRING IN YOUR AREA. ANY STATION EXPERIENCING SEVERE WEATHER CALL SKYWARN NET CONTROL AT THIS TIME. THIS IS \_\_\_ (call sign). OVER.

(BREAK)

HEARING NO FURTHER SEVERE WEATHER REPORTS AT THIS TIME, SKYWARN WILL RESUME TAKING REPORTS AT \_\_\_\_\_ (TIME). THIS IS \_\_\_\_\_, CLEAR.

## **4.4 SKYWARN Script #1 -WINTER:**

(GENERAL REQUEST FOR REPORTS)

READ EVERY 30 MINUTES

THIS IS \_\_\_\_ (call sign) NET CONTROL FOR SKYWARN IN CONTACT WITH THE NATIONAL WEATHER SERVICE FORECAST OFFICE IN \_\_\_\_\_, \_\_\_\_\_ NEAR \_\_\_\_\_.

WE ARE LOOKING FOR REPORTS OF SEVERE WEATHER INCLUDING:

1. SNOWFALL IN EXCESS OF 4 INCHES
2. SEVERE ICING ON TREES, STREETS, OR POWER LINES
3. SLEET OR FREEZING RAIN
4. WIND IN EXCESS OF 30 MILES PER HOUR
5. DOWNED TREES OR POWER LINES
6. IMPASSABLE OR CLOSED ROADS

PLEASE REFRAIN FROM CALLING SKYWARN IF THERE IS NO SEVERE WEATHER OCCURRING IN YOUR AREA. ANY STATION EXPERIENCING SEVERE WEATHER CALL SKYWARN NET CONTROL AT THIS TIME. THIS IS \_\_\_\_ (call sign). OVER

## **4.5 SKYWARN Script #2 -WINTER**

(THANKS FOR USE OF REPEATER)

READ WITH EVERY 30 MINUTES

THIS IS \_\_\_\_ (call sign) NET CONTROL FOR SKYWARN IN CONTACT WITH THE NATIONAL WEATHER SERVICE FORECAST OFFICE IN \_\_\_\_\_, \_\_\_\_\_, NEAR \_\_\_\_\_.

ON BEHALF OF THE SKYWARN PROGRAM, WE WOULD LIKE TO THANK THE \_\_\_\_\_ REPEATER GROUP FOR USE OF THEIR SYSTEM AND THE AMATEUR COMMUNITY FOR GIVING SKYWARN TRAFFIC PRIORITY.

WHEN SKYWARN HAS BEEN ACTIVATED, BUT IS NOT TAKING TRAFFIC, THE REPEATER MAY BE USED BY AMATEURS. IT IS REQUESTED THAT TRANSMISSIONS BE KEPT SHORT AND BREAKS GIVEN TO PERMIT SEVERE WEATHER REPORTS TO REACH SKYWARN.

PLEASE REFRAIN FROM CALLING SKYWARN IF THERE IS NO SEVERE WEATHER OCCURRING IN YOUR AREA. THIS IS \_\_\_ (call sign) NET CONTROL FOR SKYWARN. OVER.

## **4.6 SKYWARN Script #3 -WINTER**

### **STANDBY NET**

(GENERAL REQUEST FOR REPORTS

READ EVERY 30 MINUTES

THIS IS \_\_\_ (call sign) NET CONTROL FOR SKYWARN IN CONTACT WITH THE NATIONAL WEATHER SERVICE FORECAST OFFICE IN \_\_\_\_\_, \_\_\_\_\_, NEAR \_\_\_\_\_.

SKYWARN IS IN A STAND-BY MODE DUE TO A THREAT OF SEVERE WEATHER. REPORTS OF SEVERE WEATHER WILL BE TAKEN ON THE HOUR AND ON THE HALF HOUR. THE NATIONAL WEATHER SERVICE MAY FULLY ACTIVATE SKYWARN IF SEVERE WEATHER OCCURS.

WE ARE LOOKING FOR REPORTS OF SEVERE WEATHER INCLUDING:

1. SNOWFALL IN EXCESS OF 4 INCHES
2. SEVERE ICING ON TREES, STREETS, OR POWER LINES
3. SLEET OR FREEZING RAIN
4. WIND IN EXCESS OF 30 MILES PER HOUR
5. DOWNED TREES OR POWER LINE
6. IMPASSABLE OR CLOSED ROADS

PLEASE REFRAIN FROM CALLING SKYWARN IF THERE IS NO SEVERE WEATHER OCCURRING IN YOUR AREA. ANY STATION EXPERIENCING SEVERE WEATHER CALL SKYWARN NET CONTROL AT THIS TIME. THIS IS \_\_\_ (call sign). OVER.

HEARING NO FURTHER SEVERE WEATHER REPORTS AT THIS TIME, SKYWARN WILL RESUME TAKING REPORTS AT \_\_\_\_\_ (TIME). THIS IS \_\_\_\_\_, CLEAR.

## **4.7 SKYWARN Net Closing Script:**

**(THANKS FOR USE OF REPEATER AND AMATEUR RADIO COMMUNITY)**

READ ON CLOSING THE NET

THIS IS \_\_\_\_ (call sign) NET CONTROL FOR SKYWARN IN CONTACT WITH THE NATIONAL WEATHER SERVICE FORECAST OFFICE IN \_\_\_\_\_, \_\_\_\_\_, NEAR \_\_\_\_\_.

ON BEHALF OF THE NATIONAL WEATHER SERVICE AND THE SKYWARN PROGRAM, WE WOULD LIKE TO THANK THE \_\_\_\_\_ REPEATER GROUP FOR USE OF THEIR SYSTEM AND THE AMATEUR RADIO COMMUNITY FOR GIVING SKYWARN TRAFFIC PRIORITY AND FOR PARTICIPATING IN SKYWARN SEVERE WEATHER NETS.

WHEN SKYWARN HAS BEEN ACTIVATED, BUT IS NOT TAKING TRAFFIC, THE REPEATER MAY BE USED BY AMATEURS. IT IS REQUESTED THAT TRANSMISSIONS BE KEPT SHORT AND BREAKS GIVEN TO PERMIT SEVERE WEATHER REPORTS TO REACH SKYWARN.

WE WOULD ALSO LIKE TO THANK THE NORTHERN VIRGINIA TRAFFIC NET, WHICH NORMALLY MEETS ON THIS REPEATER EACH EVENING AT 7:30 PM, FOR CLOSELY COORDINATING ITS ACTIVITIES WITH THE SKYWARN NET.

PLEASE PASS ALL FURTHER SEVERE WEATHER TRAFFIC DIRECTLY TO THE NATIONAL WEATHER SERVICE BY TELEPHONE. THE SKYWARN SEVERE WEATHER HOTLINE TELEPHONE NUMBERS ARE: (703) 260-0206 OR 1- (800) 253-7091. REPEATING THE TELEPHONE NUMBERS: (703) 260-0206 OR 1- (800) 253-7091. THESE HOTLINE TELEPHONE NUMBERS ARE ONLY TO BE USED TO REPORT THE OCCURRENCE OF SEVERE WEATHER.

THIS IS \_\_\_\_ (call sign) NET CONTROL FOR SKYWARN. THE SKYWARN AMATEUR RADIO SEVERE WEATHER NET IS NOW SECURED AT \_\_\_\_\_. THE REPEATER IS RETURNED TO NORMAL SERVICE.

DTMF CODE \_\_\_\_\_

NOTE: Please mail all reports of severe weather to the NWS.

The address is:-Baltimore-Washington Forecast Office

NOAA/National Weather Service

44087 XXXXX XXXXX Road

City, State 20166.

## V. SKYWARN PACKET OPERATIONS

Packet Amateur Radio is an exciting method of digital communication. It involves connecting a computer to a terminal node connector (TNC) which in turn is connected to the amateur radio transceiver. We want to integrate this "new" technology into the SKYWARN system to the greatest possible extent.

The primary uses of the packet at this time are to:

1. Relay detailed (primarily winter) storm and damage reports from local subnets and spotter to the NWS; and,
2. Send watches and warnings to Local and State Emergency Services during emergency situations and communications outages.

The primary packet frequency is \_\_\_\_\_.\_\_\_\_\_ (simplex). There are a number of packet nodes on this frequency including:

- FOAKS in City, State
  - EZF in City, State
  - CARA3 in City, State
  - WINC in City, State
  - CSKY in City, State
- The first four nodes are part of the \_\_\_\_\_ network which covers most of \_\_\_\_\_. (continue with special instructions) Direct connects are preferred and are printed out in hard copy upon receipt.

Plans are beginning to form to create a regionwide high speed packet backbone on a second frequency. Until then, the use of SKYWARN packet is to simply relay one message at a time from station to station and to disconnect. Please disconnect as soon as possible to avoid clogging the frequency. Please do not read messages previously sent to the NWS.

A packet system in West Virginia has been set up linking many counties and EOC's. The system is called DAREN and a system map is in Appendix 11.9 to this manual.

## **VI. HURRICANE WATCH and/or WARNING**

SKYWARN will be activated when a hurricane is anticipated to strike the \_\_\_\_\_ area. The SKYWARN amateur radio net may be activated any time a hurricane threatens the East Coast (particularly the mid-Atlantic Region) or South Florida. In an event such as Hurricane Andrew, the National Meteorological Center (NMC) in Camp Springs, MD acts as the back-up hurricane center to the NWS's National Hurricane Center (NHC) in Coral Gables, FL.

SKYWARN may be asked to help support NMC and NWS with amateur radio communications. SKYWARN amateur radio support may also be requested to assist with backup communications to other NWS offices threatened by hurricanes, such as Norfolk (Wakefield), VA, and to assist in gathering severe weather and damage reports from areas impacted by the storm where normal communications are inoperative.

In such situations, HF will most likely be required. It may be necessary to plan staffing for many 24-hour periods. If there is a possibility of a hurricane passing within 100 miles of Sterling, VA, net control volunteers need to arrive at NWS prepared for a long stay in the event that roads are closed. See 3.1.4 Preparations for Extended Activation. Volunteers should also be certain that their family is prepared before departing to the NWS. See Family Disaster Preparedness Materials in Appendix 11.13 to this manual.

It is important to coordinate with local ARES and RACES groups.

THE REMAINING PORTION OF THIS NATIONAL EDITION OF THE MANUAL HAS NOT BEEN EDITED AND HAS BEEN LEFT INTACT AND ATTACHED AS A SAMPLE OF A STRUCTURE THAT WORKS WELL FOR THE WASHINGTON, D.C. /NORTHERN VIRGINIA AREA. VALUABLE IDEAS FOR FORMULATING PLANS FOR COASTAL AREAS OF THE COUNTRY. LOTS OF GOOD TIDBITS THAT COULD BE USED NEARLY ANYWHERE IN THE COUNTRY. GOOD STUFF -WORTH READING.

HURRICANE WATCH NET (HWN) (Instructions for Washington, DC and Virginia Coastal area)

Contact should be made with the Hurricane Watch Net (HWN) to coordinate efforts. They may need to use the SKYWARN Amateur Radio Station to relay ground truth (actual observations) reports into the NWS system. It is expected that packet will be used for these purposes.

The Hurricane Watch Net (HWN) operates in cooperation with the National Hurricane Center (NHC) in much the same manner that SKYWARN operates with the Washington, DC Weather Service Forecast Office (WSFO).

## **The purpose of the HWN is to:**

1. Disseminate hurricane advisory information to marine interests, Caribbean Island nations, Emergency Operating Centers (EOC) and other interests for the Atlantic and Eastern Pacific as promulgated by the NHC in Coral Gables, Florida.
2. Obtain weather information for the NWS from reporting stations who are not part of the routine network of the World Meteorological Organization and forward the information to the NHC.
3. Function as a backup communications link for the NHC, EOC's and NWS and other vital interests involved in the protection of life and property before, during and after hurricane events.
4. Relay initial hurricane damage assessments to the NHC.

HWN operations normally commence anytime a hurricane is within 350 nautical miles of an inhabited land mass and will continue in operation until the storm is no longer a threat. The net DOES NOT handle health and welfare type communication.

Operation will normally take place on 14.325 MHz +/-, however the operation may shift frequency at the request of stations in the hurricane affected area or to take advantage of shifting propagation conditions.

Priority is given to those stations representing the NWS and emergency management organizations. The net control volunteer of the SKYWARN station should identify that they are located at the WSFO, Washington when checking into the HWN.

The Dade County, Florida Amateur Radio Public Service Corps operates station W4EHW located in the forecast office of the NHC. Most traffic is passed to this station via the HWN or through a landline computer link to Southern Region, NWS. If these links are not available, SKYWARN may be asked to pass the information via NWS facilities located in the WSFO.

Important telephone contact numbers and other excellent hurricane information from the HWN are in Appendix 11.4 of this manual.

## **VII. SKYWARN HF OPERATIONS**

Although HF has been set up at NWS for special occasions, at the moment it is not there permanently. Therefore, an antenna needs to be set up and connected to the coax in the connector box at the base of the antenna tower. This replaces the antenna for radio #1 and radio # 1 is out of service. An HF radio and tuner needs to be connected to the antenna connection for radio #1. A 20 amp power supply is available for use for HF operations at the NWS. Plans are underway to have a dedicated coax for HF.

Information on Virginia HF Emergency Net Operations are in Appendix 11.6 of this manual. 75 meters is often used. It may be important to use HF should a storm damage large numbers of repeaters in the area.

There are plans for permanent HF at the NWS in the future. Even though this may become a reality, it is also possible that the station may be damaged by the storm and a secondary radio and antenna may need to be installed after the storm passes.

Alternatively, please try to coordinate via VHF or UHF with a local amateur operator with a home HF station or with W4PAY. See section 1.5 SKYWARN's Relationship to ARRL/ARES/RACES/REACT.

## **VIII. PUBLICITY and PUBLIC RELATIONS and AUTOCALL**

An important facet of SKYWARN operations is public relations. SKYWARN provides ample opportunities to demonstrate the unique capabilities of amateur radio as well as the volunteer and public spirit of amateur radio operators. If you speak with the press, please be extremely careful what you say because you represent the entire amateur community and the SKYWARN program. If you have any questions, please contact a forecaster BEFORE speaking with the press. If any doubt, "I don't know." is a good answer. A number of articles that have been written about the SKYWARN program are included in Appendix 11.7 of this manual.

SKYWARN is a public service activity and is not a club. Because SKYWARN does not have a checking account or dues, we make use of articles placed in The Foundation for Amateur Radio's AUTOCALL magazine in place of a monthly newsletter to keep SKYWARN volunteers informed of current events in the program. Please monitor AUTOCALL and contact the

SKYWARN Amateur Radio Coordinator if you have any questions. We thank The Foundation and AUTOCALL for their unyielding support and assistance to the SKYWARN program.

There are constant challenges to the radio frequencies set aside for amateur radio use. SKYWARN provides an identifiable and extremely visible opportunity for putting amateur radio in its best light. Severe weather is always of interest to the media. Our SKYWARN amateur radio Station has already been featured nationally on The Weather Channel and CBS' How'd Do That (segment on the Blizzard of '93 May, 1993) and in the December 1992 edition of the American Radio Relay League's QST magazine in an article on the amateur radio response to Hurricane Andrew. Locally, SKYWARN has been featured on News Channel 8 and in numerous stories in many newspapers. As a direct result of SKYWARN activities, generally, and SKYWARN participation in training exercise I.E. Zelda and regionwide communication drills in particular, and demonstrated professionalism and results as noted in NWS weather statements and reports on severe weather events, a number of Emergency Operations Centers have recognized the benefits of having amateur radio capabilities at their disposal. Thus, the SKYWARN program not only benefits the NWS and the public, but also helps to preserve amateur radio as a national resource.

The NWS does its best to promote the capabilities of the SKYWARN amateur radio net. Our SKYWARN program is set up as a model to other NWS offices around the country and has been written up in regional NWS staff notes as well as national newsletters such as AWARE. This newsletter also gets distributed to disaster preparedness groups and agencies outside of the NWS. NWS works closely with FEMA, the American Red Cross, the FCC in Emergency Broadcast Communications and with numerous state and local emergency management agencies. Therefore, SKYWARN has been, and will continue to be, an important vehicle to showcase amateur radio to the agencies involved in the allocation of privileges and frequencies.

SKYWARN has developed a large following of scanner enthusiasts, emergency managers and amateur radio operators. Let us continue to put amateur radio's "best foot forward."

## **IX. DESCRIPTION of the SKYWARN AMATEUR RADIO STATION**

The SKYWARN Amateur Radio Station consists of four radios. There are two Yaesu FT-2400 two-meter radios. The first FT-2400 is used for the primary SKYWARN net which is usually held on 147.300+ (WA4TSC Bluemont, VA) repeater. The alternate SKYWARN repeaters are 146.910- (W4XG Tysons Corner, VA) and 146.790- (W4LBL in Fairfax, VA).

The second FT-2400 is used to chase the storm. The two meter frequencies on the NWS/SKYWARN Radio Resource Map are programmed into the memories of radio # 2 as

stated below. This radio is used to seek reports from areas in which the forecasters have expressed an interest because of indications of severe weather. The frequencies are as follows

145.13- Harrisonburg, Virginia

145.21- Linden, VA

145.27- Stafford, Virginia

145.35- Waldorf, Maryland

146.625- New Market, Virginia

146.745- Berkeley Springs, W. Virginia

146.76- Jessup, Maryland

146.79- Fairfax, Virginia

146.82- Winchester, Virginia

146.91- Tysons Corner, Virginia

147.015+ Fredericksburg, Virginia

147.09+ Hagerstown, Maryland

\*147.105+ Davidsonville, Maryland

147.12+ Culpepper, Virginia

147.135+ Columbia, Maryland

147.165+ Warrenton, Virginia

147.18+ Silver Spring, Maryland

147.300+ Bluemont, Virginia

147.060+ Frederick, MD

\*During the summer months the Anne Arundel club runs a Chesapeake BayWeather Net at 11:00 a.m. and 3:00 p.m.

The FT-2400 radios are normally in the "memory" mode. If they are not, (if you turn the large knob and the frequency is moving sequentially) press the "D/MR" (Dial/Memory) button one time to toggle back to memory mode. If you need to access a frequency not in the memory, toggle

to dial mode. Controls for CTCSS and repeater offset etc. are behind a black plastic pull down cover located on the front, lower right corner of the radio.

The third radio is a Yaesu FT-712. This radio is on the 440Mhz band. The primary repeater is the 444.40+ (CTCSS 103.5) HamTalk network which covers most of West Virginia and a good portion of central Virginia. A map of the HamTalk Network is in Appendix 11.8 to this manual. The network is a chain of six repeaters that are linked full time. Accessing any one of the repeaters puts you into the entire system.

Another repeater often used is 444.75+, the Tysons Corner, Virginia, KB4NRU repeater which covers a significant portion of Northern Virginia, Maryland and the District of Columbia.

440 will likely be used more during a disaster as 2-meters is likely to be extremely busy.

The fourth radio is a Yaesu FT-5200 (dual band 2 meter and 440) which is primarily dedicated to 2 meter and 440 packet. If needed, this radio may be used for voice. The microphone is in the second drawer of the SKYWARN amateur radio desk. The primary packet frequency for SKYWARN is 145.73 (simplex) which is memory 1 of this radio.

The antenna system consists of three Diamond dual band antennas located on the NWS tower behind the forecast office. Each antenna is a combination 2 meter and 440 antenna. The lowest of the antennas goes through a junction box at the base of the tower with a PL259 connector. This connection can be used to replace the dual band antenna with either an HF antenna or another temporary antenna should the need arise.

HF radio operations may take place from the SKYWARN Amateur Radio Station by disconnecting the antenna on radio #1 and installing an HF antenna in its place. See Section VII, SKYWARN HF Operations.

Earphones for each radio are located in the second drawer of the SKYWARN amateur radio desk for use during very active and multiple nets.

## **X. NWS BALTIMORE-WASHINGTON FORECAST OFFICE**

### **INFORMATION and DIRECTIONS**

The NWS Baltimore-Washington Forecast Office is located on the northwest side of Dulles Airport in Sterling, VA.

From Dulles Toll Road and Route 28: Traveling west on the Dulles Toll Road, get off at the Route 28 exit. After the toll booth, make a right (north) on Route 28. Make a left at the second traffic light onto Route 606, westbound. Travel approximately 3.5 miles on Route 606. A landmark on the right is a series of blue-topped brick pillars. When you reach the blue topped brick pillars, slow down and make a left at the white sign through the government chain link fence. The name is, appropriately, Thunder Road (for Bruce Springsteen fans)! At the end of Thunder Road, make a right onto Weather Service Road and park in the parking lot immediately to the left under the radar tower.

Route 606 is also accessible from Route 50.

The address is: Baltimore-Washington Forecast Office

NOAA/National Weather Service

44087 Weather Service Road

Sterling, VA 20166.

Telephone numbers:

To report severe weather: -metro area (703)-260-0206

long distance (800)-253-7091

Administrative questions and training: (703)-260-0107

(8 a.m. to 5 p.m. weekdays)

Please use the severe weather hotline numbers **ONLY** for making reports of severe weather. Please do not ask questions at the end of your report and please keep your reports brief. Someone may be trying to reach the NWS with a critical report that may save a life, even if it's sunny where you are. When calling the administrative number please try to do so during good weather as the staff is extremely busy during severe weather. If you must get through to the forecast office during non-administrative hours to discuss a critical element of SKYWARN, you can call 703-260-0209.

**NWS SKYWARN Program contacts:**

SKYWARN Program Manager - Barbara McNaught

SKYWARN Assistant - Melody Hall

You need not talk to Melody or Barbara to register for a class; however, to arrange a SKYWARN training class for your club or organization, you must talk to one of these two individuals.

# XI. Weather on the Internet

There is a huge amount of information about the Weather and the National Weather Service on the Internet. Many forecast offices and NWS Headquarters have their own home pages

The following is a partial list of home pages which SKYWARN participants should find useful. Please note that this is just a partial list and the actual addresses and availability will inevitably change over time. This is just a starting point

**Editor's Note: These links may or may not be valid.**

WEATHERNET <http://cirrus.sprl.umich.edu/wxnet>

WXP Purdue <http://thunder.atms.purdue.edu/>

Bermuda Weather Service <http://www.bbsr.edu/weather.html>

Accu-Weather <http://accuwx.com>

The Weather Channel <http://www.infi.net/weather>

Automated Weather Source <http://aws.com/fame/>

Penn State Univ. Met. Dept. <http://www.ems.psu.edu/wx/index.html>

Center for Ocean/Land Stud <http://grads.iges.org/pix/head.html>

CIMSS <http://cloud.ssec.wisc.edu/>

EarthWatch <http://www.earthwatch.com/>

Canadian Maritime NWS <http://www.ns.doe.ca/>

Canadian Yukon NWS <http://yvrwww1.pwc.bc.doe.ca/>

Canadian (Toronto) NWS <http://cmits02.dow.on.doe.ca/>

FSU Meteorology Dept. <http://thunder.met.fsu.edu/>

Navy-Fleet Weather Pred <http://metoc.fnoc.navy.mil/fnmoc.html>

Earthscan <http://antares.cei.lsu.edu/>

Lyndon State Met Dept <http://apollo.lsc.vsc.edu/weather/weather.htm>

El Nino <http://www.pmel.noaa.gov/toga-tao/el-nono/home.html>

NCSU Met Dept <http://meanwx1/nrrc.ncsu.edu/>

\*\*Ohio State Met Dept <http://aspl.sbs.ohio-state.edu/>

\*\*Great for NWS Warnings!

Univ of Hawaii Met Dept <http://lumhai.soest.hawaii.edu>

Univ of Ill Met Dept <http://www.atmos.uiuc.edu/wxworld.html/top.html>

Climate Prediction Ctr <http://nic.fb4.noaa.gov/>

Tropical Pred Center <http://nhc-hp6.nhc.noaa.gov/index.html>

Nat Svr Forecast Ctr <http://www.awc-kc.noaa.gov/>

Nat Svr Storms Lab <http://www.nssl.uoknor.edu/>

Nat Weather Service <http://www.nws.noaa.gov>

GOES Pathfinder <http://diamond.asec.wisc.edu:70/11/>

Weather Hot List <http://sin.fi.edu/tfi/hotlists/weather.html>

Weather Sources <http://www.met.fu-berlin.de/DataSources/Metindex.html>

GOES Imagery <http://climate.gsfc.nasa.gov/-chesters/goesproject.html>

## **XII.APPENDIX**

**These documents are not included on the Web Versions ed.**

11.1 NWS County Warning Area of Responsibility for Severe Weather and Goals for the SKYWARN Amateur Radio Net

11.2 -MOU ARRL and NWS

11.3 -MOU Virginia ARES and RACES

11.4 -Information (Used with permission of Hurricane Watch Net)

11.4.1 -Time Zone Conversions

11.4.2 -Net Prowords

11.4.3 -Q Signals

11.4.4 -Hurricane Tracking Chart

- 11.4.5 -Conversion Formulas (knots/mph etc.)
- 11.4.6 -Dvorak Pressure/Wind Curve
- 11.4.7 -Distance Conversion Chart
- 11.4.8 -Safer-Simpson Scale
- 11.4.9 Safer-Simpson (from NWS Hurricanes!)
- 11.4.10 -Hurricane Safety Advice (from NWS Hurricanes!)
- 11.5 -VA Emergency Net Information
- 11.6 -Amateur Frequency HF/VHF/UHF Allocation Chart, Band Plan and Country Prefix codes  
(Used with permission of Icom America, Inc.)
- 11.7 -Articles Written About SKYWARN
- 11.8 -HamTalk Network Map
- 11.9 -DAREN (WV Packet
- 11.10 -TMARC Repeater and BBS Maps and Lists
- 11.11 -ARRL NTS Formal Traffic Forms and Instructions
- 11.12 -ARRL Emergency Nets (Used with permission of the ARRL)
- 11.13 -Family Disaster Plan
- 11.14 -Fire, Police, NWS and Emergency Telephone Numbers
- 11.15 -Virginia SKYWARN District Map
- 11.16 -SKYWARN Advisory Committee Description
- 11.17 -SKYWARN Amateur Radio Coordinator Position Description
- 11.18 -Winter Storm Report Form
- 11.19 -Summer Storm Report Form