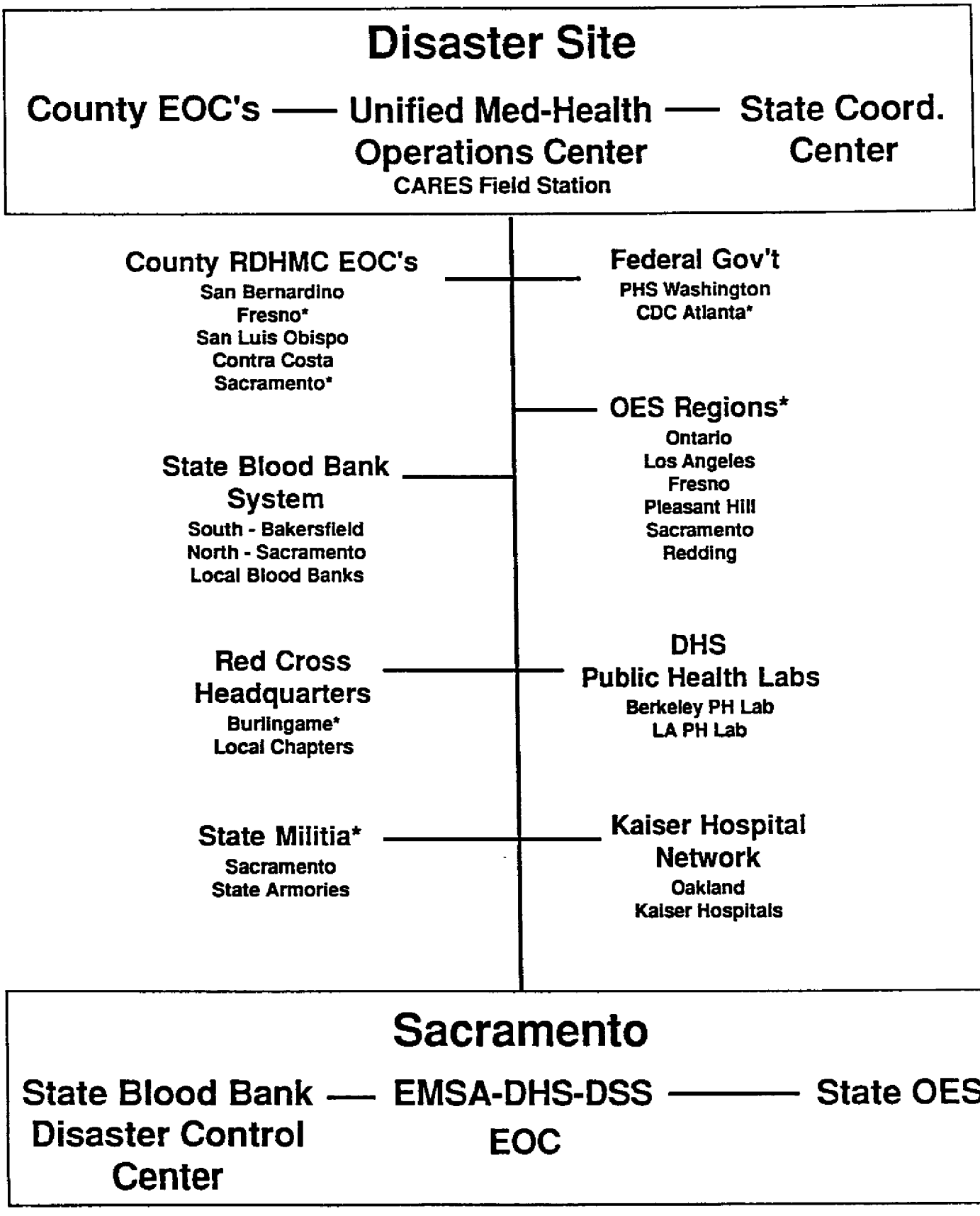
ATTACHMENT 1

State Health-Medical-Welfare Amatuer

Radio Communications Network

State Health-Medical-Welfare
Amateur Radio Communications Network
September 1, 1988



* Not tested

ATTACHMENT 2

EMSA Hospital Bed and Communications Survey

STATE OF CALIFORNIA GEORGE DEUKMEJIAN, Governor

EMERGENCY MEDICAL SERVICES AUTHORITY
1030 15TH STREET, SUITE 302
SACRAMENTO, CALIFORNIA 95814

January 25, 1989

To: County Health Officers
County EMS Agencies
Regional Disaster Medical Health Coordinators

From: Calvin Freeman, Chief
EMS Authority Disaster Section

Subject: Disaster Victim Distribution and Communications Drill

On April 6, the EMS Authority will conduct a one-day exercise designed to accomplish two objectives:

(1) To begin to formalize the policies and procedures for regulating the distribution of disaster victims to unaffected parts of the state; and,

(2) To test various communication methods that the Authority expects to use to coordinate the location and acquisition of disaster medical mutual aid resources throughout the state.

Should a catastrophic earthquake occur in either Northern or Southern California, a large number of casualties may require evacuation. Medical response plans call for casualties to be moved from Casualty Collection Points to Regional Evacuation Points and from there via fixed wing aircraft to hospitals in other parts of the state where they can receive appropriate medical care.

Military experience with massive patient airlifts found that only sufficiently stable casualties can withstand the rigor of aeromedical evacuation. Care must be taken to ensure that only stable patients are evacuated from the Regional Evacuation Points. Therefore, casualty reception areas in other parts of the state should receive very few patients in need of immediate medical care. Also, medical response plans for a Southern California medical disaster call for distributing casualties among several geographic areas. This should further reduce the number that any one reception point would have to handle. In the case of a major Southern California disaster, casualties would be distributed to the following areas:

1. San Francisco/West Bay

2. San Jose/South Bay

3. Alameda/Contra Costa

4. Sacramento

5. Fresno

6. Stockton/Modesto

7. San Diego

8. Possibly Redding

Every effort will be made to rotate casualty evacuation flights among these areas. The larger counties would receive no more than two plane loads in a row and the smaller counties no more than one. Reception areas will be frequently polled to monitor changes in their capacity to receive casualties.

The drill in April is designed to test only one part of the overall system; the ability of the state to acquire initial estimates of casualty reception capabilities from all of California's counties in a timely manner. Details on how the drill will be played out will be provided in early March.

At this point, we envision a straightforward drill. It will start with an Authority alert that a disaster has occurred. We will then request you to inform us and your Regional Disaster Medical Health Coordinator (if your region has one) of the number of evacuees from the disaster area that medical care facilities in your county can accept. (The Regional Disaster Medical Health Coordinators are county health officers who have volunteered to coordinate regional medical supply and patient distribution efforts with your county health officer.) We would like you to communicate with both of us so that we can assess the availability of direct communications with county health emergency operations should a disaster occur in your area. You may wish to test a variety of communication methods -- radio, telephone, FAX, computer -- to send this information to the Authority.

Your county can participate in this drill in either of two ways. You may elect to either:

1. Collect hospital bed data immediately after being alerted by us and then communicating it when you have it; or

2. Collect the data at an earlier time and communicate it to us the day of the drill.

Whichever choice you make, we would like to receive accurate data about your ability to receive casualties.

In future drills we plan to carry the process further, simulating the actual arrival of casualties in your county and requesting

updated hospital capability data. In April, however, we are requesting a one-time only report.

To help us prepare for this drill, please complete the two attached questionnaires. The first questionnaire is designed to acquire emergency personnel contact and communications capability information. This will help us identify, among other things, how communications will occur with counties, how timely it will be, and what hardware we will need to handle it.

The second questionnaire requests information on how your county determines the capacity of hospitals to receive casualties. We are interested in the categories you use to report the data, how long it takes to gather the information from the hospitals, and what methods are used to communicate this information. This data will be used to develop a hospital bed capacity form.

The questionnaires have been sent to both the local EMS agency and the County Health Officer. Only one response per county is needed. Please mail or FAX the attached Participation Response Form and questionnaires to the Authority no later than February 27. Our FAX number is 916-324-2875. If you have any questions about the drill or the questionnaires, please call Gus Koehler at (916) 322-2300.

PARTICIPATION REPONSE FORM

Name _____ Title _____

County _____ Telephone Number (____) _____

Fax Number (____) _____

My county will [ ] will not [ ] participate in the April 6 exercise.

COUNTY NAME: _____

Name of person completing this questionnaire:_____

Telephone number: (_____)_____

Name of county **disaster medical response coordinator:**

_____

Telephone number: (_____)_____

Agency and address: _____

_____

_____

_____

A. Hospital Bed Categorization

The categories used for hospital bed categorization by the Armed Services Medical Regulating Office are listed in the chart below and defined on the attached page. In the chart below, indicate by an "X" in the appropriate boxes whether your county:

1. uses the listed category (or similar category) for determining the availability of hospital resources in a disaster;

2. does not use the listed category; and,

3. if not used, whether your county currently has the capability to gather data according to this category.

In the remaining four rows, please enter any other patient categories your county uses.

Patient Category	County Uses	County Does Not Use	County Can Use
1. Medical			
2. Psychiatry			
3. Surgery			
4. Orthopedic			
5. Spinal Cord Injury			
6. Burns			
7. OB/GYN			
8. Pediatrics			
9.			
10.			
11.			
12.			

Comments: _____

_____

_____

_____

_____

CONTINGENCY REGULATING CATAGORIES

CODE	CLASSIFICATION	DEFINITION
MM	Medical	Patients having, or suspected of having, a medical illnesses or disorders not coming within the purview of a more specific specialty.
MP	Psychiatry	Patients, usually older then 12 years of age, requiring psychiatric care.
SS	Surgery	Patients having, or suspected of having, diseases or injuries normally treated by surgery and not included in any of the other surgical specialties.
SO	Orthopedic	Patients having, or suspected of having diseases or injuries of the musculoskeletal system, or residuals thereof, for which surgical treatment is indicated. Also included are conditions which require reconstruction of deformed extremities and diseases or injuries of the bones and joints including the spine and foot.
SC	Spinal Cord Injury	Patients having or suspected of having diseases or injuries to the spinal cord.
SB	Burns	Patients requiring treatment at a specialized burn unit.
SG	OB/GYN	Female patients having, or suspected of having, diseases, injuries or conditions related to the genital system and patients who are pregnant or have, or suspected of having, any medical, surgical, or obstetric complication of pregnancy.
MC	Pediatrics	Patients in the pediatric age group who require general medical care or treatment for childhood diseases or injuries.

B. **Method for Communicating Data**

How does your county gather hospital capacity data? Please check the appropriate line(s) if you use that particular method.

____ 1. **Radio by voice (frequency _____)**
____ 2. **Digital radio (frequency _____)**
____ 3. **Regular telephone (voice)**
____ 4. **Dedicated telephone line to each hospital (voice)**
____ 5. **Direct computer link with each hospital using dedicated telephone lines**

C. **Time Required to Collect Data**

Please check the line that is closest to identifying the actual amount of time it takes to determine hospital bed availability for your entire county using your current system.

____ 1. **Less than 30 minutes**
____ 2. **One hour**
____ 3. **One hour and 30 minutes**
____ 4. **Two hours**
____ 5. **Two hours and 30 minutes**
____ 6. **Three hours**
____ 7. **Three hours and 30 minutes**
____ 8. **Four or more hours**

D. Comments:

THANK YOU FOR TAKING THE TIME TO FILL OUT THIS QUESTIONNAIRE

COUNTY NAME: _____

Name of person completing this questionnaire:

_____

Telephone number: (_____)_____

A. Communication System Organizations and Coordinators

1. Name of county disaster **medical response coordinator:**

_____

Telephone number: (_____)_____

Agency and address: _____

_____

_____

_____

2. Name of **Data Processing System Manager** (he/she should know if and how the county data system does or could interface with State computer systems such as the Health and Welfare Data System, TEALE, etc.):

_____

Title: _____

Telephone number: (_____)_____

3. Name of County **Communications Director** if county will provide medical/health communications with the Authority:

_____

Title:_____

Telephone number: (_____)_____

B. Communication Methods that are Available to Communicate with the Authority

1. Which of the following communication methods are available for communicating with the Authority? Please check the appropriate line(s).

____ a. **Amateur radio** (capabilities will be identified below)
____ b. **State data center terminal** (Tiel, Health and Welfare, etc.)
____ c. **Digital communication via dial up modem**
____ d. **Dial-Com Public Health Computer Network**
____ e. **Personal Computer communications via telephone modem**
____ f. **Fax**
____ g. other: _____
_____

C. **Amateur Radio** - Please provide the following information if this means of communication if available to you.

1. **Name of amateur radio organization, if any, that will be used to provide emergency radio communications:**

_____
_____

2. Name of the **Radio Officer** of the above organization:

_____
Call sign: _____
Telephone number: (_____) _____
Mailing address: _____
_____

3. Does this organization:

____ a. **Have its own dedicated equipment**
____ b. **Use equipment provided by the county or OES**
____ c. **Depend on members to bring personal equipment in**
____ d. **Other:** _____

4. What capabilities does this station have (check more than one line if appropriate):

____ a. **VHF**
____ b. **UHF**
____ c. **HF**
____ d. **Digital**

5. Where is the emergency radio station located:

____ a. **County Emergency Operations Center**
____ b. **Office of Emergency Services**
____ c. **Separate medical/health emergency operations center**
____ d. **Private residence**
____ e. **County communications center or other county location removed from the county Emergency Operations Center**
____ f. **Other:** _____

6. Is a personal computer immediately av
emergency communications by:

____ a. **Telephone (dial-up number:** _____
____ b. **Radio**

7. **What is the stations primary repeater frequency?**

_____

8. Are you part of a **PACKET** radio mailbox system?
____ **Yes** ____ **No**

If yes, what is the **name of the system** that you use and its frequency? **Name:** _____
Frequency: _____

9. If a disaster should occur in your area, what would your **primary operating frequencies** be for:

VHF _____
UHF _____
HF _____
Digital _____

10. Realistically, **how many trained and licensed operators** do you expect to have available to operate your station should a disaster occur? _____

11. Which other public or private agencies plan to use your amateur radio station?

_____ a. **Fire**
_____ b. **Law Enforcement**
_____ c. **Transportation**
_____ d. **Red Cross**
_____ e. **Social welfare**
_____ f. **Other(s):**
_____
_____
_____

12. Comments:

THANK YOU FOR TAKING THE TIME TO FILL OUT THIS QUESTIONNAIRE

ATTACHMENT 3

Amateur Radio Communications Report -- EMSA Hospital Bed Availability Exercise

D R A F T

AMATEUR RADIO COMMUNICATIONS REPORT

EMSA HOSPITAL BED AVAILABILITY EXERCISE

APRIL 6, 1989

On April 6, 1989, the Emergency Medical Services conducted a combined hospital bed availability - communications exercise, directed at a catastrophic level disaster in the San Francisco Bay Area The communications element the of exercise required responding agencies to attempt communications by as many means as they had available, including Amateur Radio.

The CARES-SHARES Amateur Radio support groups were included in the exercise not only to participate in the hospital bed response, but also to test the viability of the statewide Health-Medical-Welfare radio network (HMW Net) recommended after the 1987 Southern California Earthquake Exercise (Response 87). The primary radio communications goals of the exercise were:

1. To gather current information on the Amateur Radio communications capabilities and the identity of the responsible radio officer for as many as possible of the California agencies on the HMW network chart (included as Attachment A).

2. To establish interest in the HMW Net by collecting the information in #1 above via Amateur Radio.

3. To continue to test the capabilities of the CARES-SHARES radio stations and personnel.

In preparation for the exercise, all California counties were mailed a questionnaire requesting information on their Amateur Radio support capability. Follow up contacts were made through both government and Amateur Radio channels to encourage agencies to participate in the exercise, and establish contacts between the county Emergency Medical Services agencies and their communications counterparts.

Contacts were also made with with the following agencies, whose support was critical to the success of the exercise:

1. The State Blood Bank System has an established Amateur Radio network, and has Amateur Radio stations in most of it's facilities. It was the impressive participation of these stations in the Response 87 exercise that led to the proposal of expansion of their system into a State HMW Network.

2. The Red Cross is tasked with working with the State Department of Social Services (DSS) in coordinating State response to care and shelter needs in a catastrophic disaster. The CARES Amateur Radio group supports DSS communications, and needs to begin working on the DSS-Red Cross communications links.

3. State OES coordinates all emergency communications response to a catastrophic disaster, and communication links to the State and Regional offices are critical.

4. Kaiser Hospitals is establishing an Amateur Radio VHF network in Northern California which will provide effective local-regional-state hospital back-up radio communications.

5. The Sacramento City Communications Reserve (a 130 member local Sacramento Amateur Radio Emergency response group) supports State disaster response by providing operators and equipment at both Sacramento and disaster site radio stations.

The invitation to participate and the exercise plan follow this report as Attachments B and C.

Based on responses prior to the exercise, we expected 16 official agency radio stations to participate. At the end of the exercise, we had 35 stations responding. While this unexpected level of participation played havoc with the planned agenda, we are extremely encouraged by the interest in the HMW Net. The following agencies participated in the exercise:

* County EMS Agency	Napa County
* County EMS Department	Kern County
* County EMS	San Luis Obispo
* County EMS	Riverside
* County EMS	San Bernardino
* County Health Department	Nevada County
County EMS Agency	Santa Barbara County
* County Communication Center	Santa Cruz County
County Health Care Agency	Ventura County
County EMS	Shasta
County OES	Shasta County
* County EMS Agency	Fresno County
Chico Blood Bank	Chico
California Blood Bank System	San Bernardino County
Houchin Community Blood Bank	Bakersfield
Alameda-CC Co Blood Bank	Oakland
Fresno Blood Bank	Fresno
Delta Blood Bank	Stockton
Merced Blood Bank	Merced
Peninsula Memorial Blood Bank	Burlingame
Sacramento Blood Bank	Sacramento
State Office of Emergency Svs	Sacramento
State Office of Emergency Svs	Redding
State Department of Health	Berkeley (Public Health Lab)
State Department of Health	West Berkeley (Toxics Lab)
State Department of Health	Fairfield
State Health & Welfare Agency	Sacramento
City Communications Reserve	Sacramento
Kaiser Hospitals	Oakland
UC Davis Medical Center	Sacramento
Merced Community Medical Cen	Merced
Diablo Red Cross	Contra Costa Co
US Bureau of Reclamation	Sacramento
CSUS Amateur Radio Club	Sacramento
Contra Costa Co Fire Dist	Contra Costa Co

* passed hospital bed traffic via Amateur Radio

NET OPERATIONS

VHF - Sacramento City Communications Reserve (SCCR)

Because of station limitations at the CARES Health and Welfare Agency radio station in Sacramento, we requested that the Sacramento City Communications Reserve conduct VHF operations in the Sacramento-San Joaquin Valley areas. That allowed the CARES Station to simultaneously conduct VHF operations to the San Francisco Bay Area. The general lessons that could be learned from the SCCR operation were:

1. The association between the City of Sacramento (SCCR) and the State Health and Welfare Agency has been very beneficial to both agencies. The operating agreement is that when a local disaster occurs, the State CARES Station and operators are made available to support local operations; in the event of a catastrophic disaster outside the Sacramento area, the SCCR will support State operations. This situation keeps local and State Amateur Radio groups operating in a cooperative and coordinated manner.

2. The primary SCCR base station has some operating peculiarities that caused the assigned operator to believe that it was malfunctioning. With the continued trend towards complexity in equipment, we recommend that any operator back up a base station with his/her own mobile unit. We also recommend that primary operators be trained on station equipment, and that operating manuals be located with the equipment.

3. A Packet station, including a full sized PCXT computer was brought in by an operator for the exercise. While the electronic problem in the XT that caused a delay in packet operations may not have been caused during transport, we recommend that agencies consider designation of an in-house PC to emergency packet radio operations, including software and cabling, so that the system is ready to function immediately in an emergency.

4. With the single antenna operating limitations of the SCCR Station, our ability to conduct simultaneous VHF voice, VHF digital, and UHF transmissions (UHF planned for coordination with the VHF CARES Station about 10 blocks away) were limited. With the new active band-mode options available to Amateur Radio, we recommend that antenna systems be installed allowing communications on at least two VHF and one UHF channels simultaneously.

5. In both the SCCR and CARES stations, several simultaneous operations tended to cause confusion and difficulty in hearing received transmissions. At a minimum, operators should be using earphones, and consideration should be given to physically compartmentalizing operators in some way.

VHF - HF State Health & Welfare Agency CARES Station

1. General Operations -

The HMW Net received about twice as many check-in's as expected. Since our plan called for first collecting essential station and administrative information from any station checking in, we used up all of our time on that goal, and were not able to conduct planned digital traffic. In addition, the Net was generally less interesting than planned, as each station passed it's information in turn. However, we feel that the communications reports and the information gathered were of first importance to the continued operation of the Net, and will plan for rescheduling the digital tests in the near future.

Frequencies were planned on HF for both voice and digital modes. After a number of HF exercises, we have concluded that emergency digital communications must be constantly coordinated on voice channels, and we are therefore dropping preannounced digital frequencies. Any digital operations will be agreed to on voice frequencies after determining a clear digital frequency. The HMW Net emergency operating frequencies for all voice bands seem to be serving us well - we have not been informed of any interference problems - and they are now listed on the new Network Chart at Attachment D.

The net control station should have had instructions to establish several relay stations, and had them listen for stations outside the skip zone of Sacramento. We received no check-ins from the LA basin south to San Diego, and with the constant activity on the net, they may have given up trying to get in.

We felt that the participating stations maintained excellent operating procedures, and that the net proceeded very smoothly.

2. CARES-SHARES Station Deficiencies -

The deficiencies of the CARES and SHARES Stations have been documented and are in the process of being corrected, so they will not be reported again here. No additional notable deficiencies were found in this exercise.

It may be of interest to HMW Net participants to know about the planned use of State computer systems in a major disaster. While Amateur Radio will typically be the only communications between Sacramento and a disaster area for some hours following the event, we expect digital systems to be restored as a priority. Some digital systems may even survive a major disaster.

During the Response 87 exercise, long haul packet networks didn't function well, and HF digital modes were too slow for the level of traffic we were expected to deliver. In addition, the novelty of Amateur Radio Packet resulted in traffic being passed via that medium when higher speed telephone digital systems would have been adequate. Our current thinking on this issue is that Amateur Radio digital traffic from a disaster area should be sent to the nearest location where the traffic can be transferred to active phone line or microwave digital systems. We experimented with this concept in Response 87, and while multi-hop packet traffic was not getting through, a remote link that we established in Bakersfield was functional with one-hop from Los Angeles to Sacramento.

The State Health and Welfare Agency departments are developing emergency communications systems on State and National computer networks, and Amateur Radio must develop awareness of those systems and effective links to them.

The use of radio operators for pure computer functions such as data input, retrieval, and transfer will become a severe problem in a catastrophic disaster, where licensed radio operators will be needed solely for radio communications. We recommend that thought be given to creating a Disaster Service Worker - Computers class, and actively promoting the use of computer operators for emergency work.

SUMMARY

The April 6, 1989 exercise was a good start on developing an effective Health-Medical-Welfare Amateur Radio Network. There is much interesting and exciting work to be done, and technology will present us with increasing options for transmitting emergency traffic.

The August FEMA SF Bay Area earthquake exercise will give us our next opportunity to test the development of the HMW Net, but in the meantime, we need to practice digital modes, and develop integration with land-line computer systems.

3. Repeater Operations

The 147.735 San Francisco repeater worked well for the exercise. It was coordinated with the owner, WA6HAM, and the Contra Costa County RACES, and we hope to continue to occasionally conduct exercises on that machine. With the proliferation of State and local exercises and community service events in the SF Bay Area, repeater owners are becoming increasingly reluctant to allow lengthy closure of repeaters to normal use. We recommend that SF Bay Area HMW Net groups continuously reinforce the need for catastrophic disaster tests with local repeater owners.

The need for additional or replacement digital and voice repeaters was significant in the 1987 Southern California Earthquake Exercise. While the April 6 HMW Net exercise wasn't designed to demonstrate this need, it is highly likely that SF Bay Area repeaters would also be overloaded with local emergency traffic. The availability of small, low-powered digital packet systems, and VHF-UHF transceivers with cross band duplex capabilities make it feasible to construct portable repeaters and digipeaters for deployment in a disaster. We recommend that this be a priority for future exercises.

4. Communications responsibility -

There was some confusion from County EOC Stations regarding State OES's role in this exercise. Most local agencies view the State emergency response as being monolithic, and wondered if this was a State OES exercise. We regret the confusion. While the funneling of all State logistic traffic through State OES is appropriate in a small disaster, in a catastrophic disaster the required communications would quickly overwhelm any single communications system. Recognizing this, State OES and the State Health-Medical-Welfare agencies are working on systems where important information would be shared, but the massive medical supply and evacuee traffic would be channeled through different systems than the State OES Network - notably, the Amateur HMW Net and State Health and Welfare Agency computer networks.

5. Computer Operations -

The integration of radios and computers is becoming increasingly important to emergency response. In this exercise, four computer networks were being tested in addition to radio packet systems. The radio operators received hospital bed availability data in 9 counties, and data for one county was reloaded by the radio operators into two of the computer networks.

We should also consider starting a regular HMW Net meeting, possibly at about Noon on the same day as the scheduled State Blood Bank Net (the first Wednesday of the month at 8PM). The cover letter to this report will solicit interest in such a meeting.

We appreciate the participation of all of the volunteer Amateur Radio Operators that took the time to assist us in this exercise.

ATTACHMENT 4

Computer-Based Communications

Hospital Bed Reporting Form

INFO: REGION VI MEDICAL/HEALTH COORDINATOR

SUBJ: RIVERSIDE COUNTY CONSOLIDATED HOSPITAL BED CAPACITY

A. As of 1045 L Hour 4/6-89 Date the below Hospital Bed Capacities, by Patient Category, are available in Riverside County.

B. HOSPITAL BED CATEGORIZATION

	PATIENT CATEGORY	BEDS AVAILABLE
1.	MEDICAL	96
2.	PSYCHIATRY	11
3.	SURGERY	115
4.	ORTHOPEDIC	54
5.	NEUROLOGICAL/SPINAL CORD	13
6.	BURNS	0
7.	OB/GYN	89
8.	PEDIATRICS	62
9.	EMERGENCY	77
10.	ADULT ICU	38
11.	PEDIATRIC ICU	4
		55

C. TOTAL BEDS AVAILABLE 559

D. COMMENTS: HOSPITALS ON STANDBY FOR ANY ADDITIONAL INFORMATION REQUIRED PLEASE ADVISE ASAP WHEN HOSPITALS CAN STAND DOWN.