

# RADIO HAMS



"YOUR radio transmitter is completely smashed by a falling chimney. How long will it take to borrow an old broadcast receiver from a neighbor and build a new transmitter from its parts?"

That's a sample of the questions that radio amateurs are being asked. Aware of the grave possibility that it may need to help defend America, the amateur world is preparing itself for action. Half a dozen different radio organizations are drilling over the air.

"Simulate destruction of your main transmitter. Rig up your emergency equipment and report back on the air as soon as you can," was another command that went out to members of one group. Recently when a club of amateurs assisted in nighttime army maneuvers, one operator was asked how much time he would need to get his portable station into operation in the field, without even a match to help him see. "Six minutes is the average time," he replied. The officers were skeptical but in less than that time he had opened up his suitcase set, attached a six-volt automobile storage battery, hammered a ground stake into the earth, slung his antenna to a tree, and was tapping out a call to the control station fifteen miles away.

The Army Amateur Radio System that is affiliated with the Army Signal Corps, the



*Top, left, amateur with lightweight key station in field. Right, transmitting equipment at emergency station. Bottom, measuring wave length*

# PRACTICE *for* WAR



Naval Communication Reserve, and the Amateur Emergency Corps of the American Radio Relay League are the three main networks of amateur preparedness.

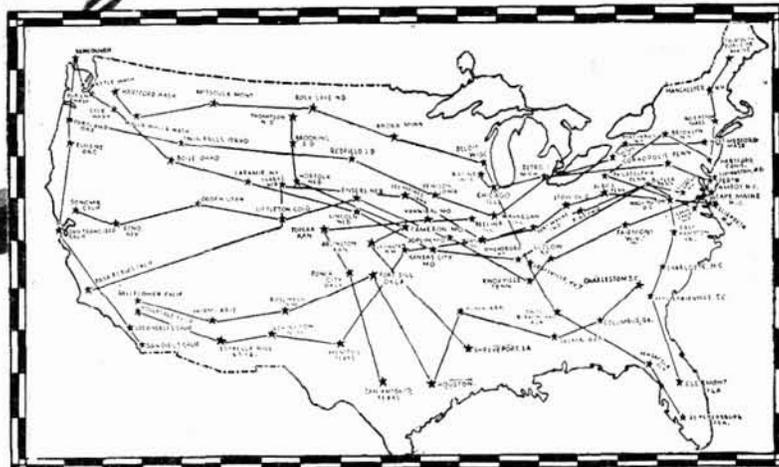
In time of war thousands of trained members of these nets would be taken in by the military services for active duty and many others would be detailed to guard various frequencies to detect enemy and spy messages. Restrictions governing amateur radio are being tightened and today all owners of amateur transmitting stations must be fingerprinted and show proof of citizenship. Communication with stations outside of the United States and its possessions is no longer allowed.

On several recent occasions zealous amateurs copied down code messages that didn't seem to make sense and forwarded them to the Federal Bureau of Investigation. All the messages were harmless, it so turned out, and were secret code practice messages of the army amateur net, which sometimes uses an obsolete cipher for training. The army amateurs use Z signals instead of Q abbreviations and they are trained to handle messages using army procedure. Close to 1,800 operators are members of the system, which is controlled by an officer in the Signal Corps message



*Top, member of amateur radio emergency corps throwing line over tree for stringing up a temporary antenna in the field. Left, antenna for radiating signals from small automatic transmitter*

*Right, map showing twelve trunk lines of American Radio Relay League. This system would be invaluable in a national emergency*





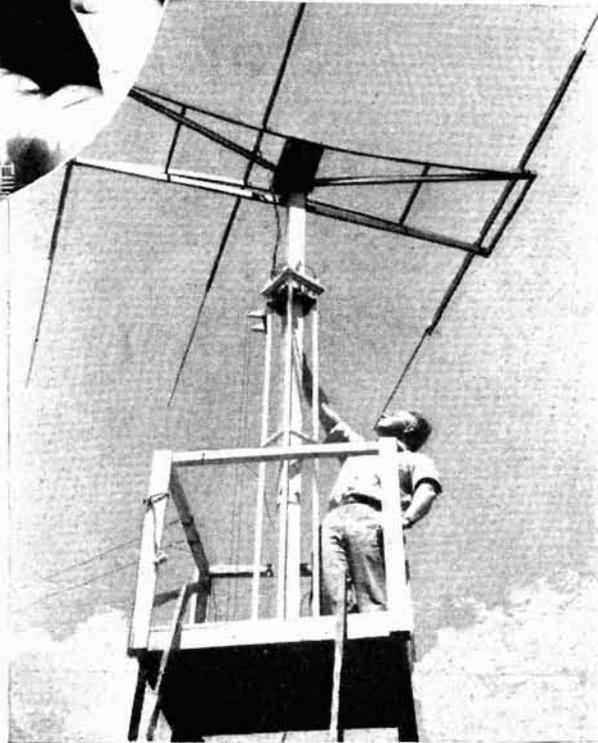
*Top, amateur operator at station controls.  
Center, plug-in frequency coils used to  
change station's transmission wave length.  
Bottom, rotatable beam antenna*

center in Washington, D. C. The national army network is divided into nine corps area networks each under the corps area signal officer, and these in turn are made up of state nets. Each state net consists of a number of local networks that are comprised of groups of amateur stations.

The army amateur network is not a part of the military service. To join it you need to have a reliable transmitter, be able to operate at least fifteen words a minute and conduct yourself and your set properly. There is no physical

examination or age limit. A number of radio phone operators are members of the net but code predominates and is preferred because code operators are of more value to the military service and dots and dashes carry farther and are easier to read through interference. Several practice drills are held over the air every week. The army amateur group is fifteen years old and long has been recognized and used by the Red Cross. It is still the official communication system for that organization. In time of emergency any member station in the net has authority to handle emergency radio traffic on an army frequency authorized for army use only. During several major floods members of army networks have performed important duties.

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# Radio Hams Practice for War

(Continued from page 404)

Like the A.R.R.L., the army nets handle and relay messages free of charge upon request, although the messages can't be of a commercial nature. Their over-seas relay stations are often busy with traffic for Hawaii, Guam, and the Philippines.

One type of cipher sometimes used by the army radio amateurs involves the use of a key word or phrase, from which is derived a numerical key. If we assume the "Literal" key to be "PUBLICITY," (nine letters) these letters are numbered from 1 to 9 according to their alphabetical sequence. The first letter of the alphabet which appears in the key word, is numbered 1, the next 2, etc. In case two or more like letters appear in the key word, they are given consecutive numbers, thus:

Figure 1

P	U	B	L	I	C	I	T	Y
6	8	1	5	3	2	4	7	9

The plain text is written underneath the numerical key, in lines extending the whole length of the key, as follows:

P	U	B	L	I	C	I	T	Y
6	8	1	5	3	2	4	7	9
N	O	T	I	F	Y	Y	O	U
R	N	E	T	C	O	N	T	R
O	L	S	T	A	T	I	O	N
B	Y	R	A	D	I	O	E	X
A	C	T	H	O	U	R	A	N
D	M	I	N	U	T	E	W	H
E	N	T	H	I	S	M	E	S
S	A	G	E	W	A	S	C	O
M	P	L	E	T	E	L	Y	D
E	C	I	P	H	E	R	E	D
B	Y	Y	O	U				

The columns are now transcribed, from top to bottom, in numerical order; column 1 first, then column 2, etc., and at the same time the cipher text is divided into groups of five letters, thus:

TESRT ITGLI YYOTI UTSAE  
 EFCAD OUIWT HUYNI OREMS  
 LRITT AHNHE EPONR OBADE  
 SMEBO TOEAW ECYEO NLYCM  
 NAPCY URNXN HSODD

The cipher message is now ready for transmission.

To decipher the cryptogram, the receiving operator divides the total number of letters in the cryptogram (95) by the num-

ber of letters in the key word (9). The result is 10, with 5 as remainder. On cross-section paper, he writes the key word, using one square for each letter, deriving the numerical key as explained above (see Fig. 1). Underneath, he outlines a figure containing 9 columns. Nine columns of 10 squares each will give only 90 squares, so he must add 1 square to the bottom of each of the first 5 columns, in order to have one square for each letter of the cryptogram. He inscribes the first 11 letters of the cryptogram in column 1, from top to bottom; the next 10 in column 2, and so on until the entire cipher text has been inscribed. This will completely fill the figure, and the message needs only to be re-written according to word lengths. It reads: NOTIFY YOUR NET CONTROL STATION BY RADIO EXACT HOUR AND MINUTE WHEN THIS MESSAGE WAS COMPLETELY DECIPHERED BY YOU.

The Naval Communication Reserve is a definite part of the naval establishment. Members are subject to active duty in a national emergency. Applicants must be American citizens, between eighteen and thirty-five years of age, and must pass a physical examination. Men with no knowledge of radio are taken in as apprentice seamen for training. Amateur members who operate their own stations are enlisted as first or second-class seamen and their stations make up part of the navy reserve network. All members must normally attend a weekly drill at which studies and examinations are conducted, as well as code, blinker, and flag-signaling practice.

The American Radio Relay League is the oldest of all amateur groups and in more than 100 emergencies since 1914, including storms, earthquakes, and floods, member stations have rapidly transmitted and delivered important messages. During the Los Angeles flood of 1938, the amateur operators handled traffic for seventy-two hours for the police, the telegraph companies, and for other agencies. Newspapers were served with news via the amateur network and the first pictures of the flood to reach eastern newspapers were transmitted by radio from an amateur station. The A.R.R.L. has a number of transcontinental trunk lines for handling traffic

(Continued to page 120A)



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and these are served by feeder lines that reach all parts of the country. In the last several years a number of local amateur emergency corps have been organized inside the membership. Besides main transmitting equipment, many emergency corps members have portable equipment, operated by storage batteries or small gasoline-driven generators, that can be transported by car or on foot to difficult locations. One emergency group in southern California has 300 members who are building a master control station for handling traffic between the small portable sets.

In Los Angeles, the Major Disaster Emergency Council, which is a behind-the-scenes organization that would take over the handling of relief and public safety in event of a major disaster, has enlisted sixty amateur operators who with their portable equipment are ready to handle emergency communication in time of need. The system consists of twenty-one portable transmitters and receivers and a powerful central station that is ready for instant operation. The amateur operators wear a special uniform and each has special instructions concerning his duties. If the Los Angeles area were ever threatened by invasion or air raids the disaster council would swing into action at once. Of course, the volunteer radio section would be depended upon to provide emergency communication facilities.

In all part of the country, amateurs are preparing themselves against a possible "M" day. In fact, they have already started to participate in national defense because a number of them have answered the call of the Federal Communication Commission for trained, intelligent men who are needed to man the new long-range surveillance and direction-finding radio interceptor stations that are being built as part of the national defense program. These stations, some of them mobile, will keep a twenty-four-hour watch on all communication channels to locate and track down all unauthorized or suspicious radio transmitters.

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