

# How "Walkie-Talkies" Served at Empire State Building Fire

## Pack-Set Radio Proves Invaluable in Directing Ground-to-Cloud Operations

By ART H. MEYERSON

*Editor's Note:* The collision and fire involving the Empire State Building July 28th last was unique in the annals of American fire-fighting.

Among other things, the tragedy demonstrated the need of effective liaison and communications between fire-fighting and other emergency units at the scene of the catastrophe, and between these units and their respective headquarters.

Fire officers know that the greater the area involved in any disaster, and the greater and more diversified the number of emergency units called into operation, the more difficult the task of maintaining liaison between all forces. This was demonstrated time and again during the blitz in England.\*

It is further true that in these large-scale disasters, normal communications are too often disrupted, if not destroyed. In his report to the Mayor, Patrick Walsh, Commissioner and Chief of Department said:

"The blast occurring on the 78th and 79th floors disrupted the house telephone system, making inter-communication most difficult."

The Commissioner and Chief further states in his report:

"The co-ordination of all the . . . company operations covering three separated but related fires, was greatly facilitated by the use of the Fire Department's short wave radio pack-sets. Operated by Firemen Meyerson and Gertsen, the short wave radio proved itself of unmistakable value maintaining liaison between the officers in charge of the entire operations and those directing extinguishing activities at the particular spots involved. This was particularly valuable because of the confused and unreliable conditions of telephone communications at the time. The pack radio supplied a walking eye for the Chief in Charge."

In its staff report on the Empire State Building fire\*\* FIRE ENGINEERING stressed the important part

that both short-wave fire and police, and commercial broadcast radio played in meeting the emergency. At the time that account was written, the details of the excellent work done by the Fire Department's short-wave "Walkie-Talkies" were not known. Since then, however, the New York Fire Department has courteously made available much of the story of how its pack-sets functioned at the scene. The editors are privileged, therefore, to bring to their readers these particulars over the signature of one of the two firemen-operators who actually handled the on-the-ground (and in-the-air) shortwave communications during the trying hours of the emergency, Fireman Art H. Meyerson.

The editors further acknowledge with thanks the cooperation of Com-

\*FIRE ENGINEERING, September, 1945, page 671.

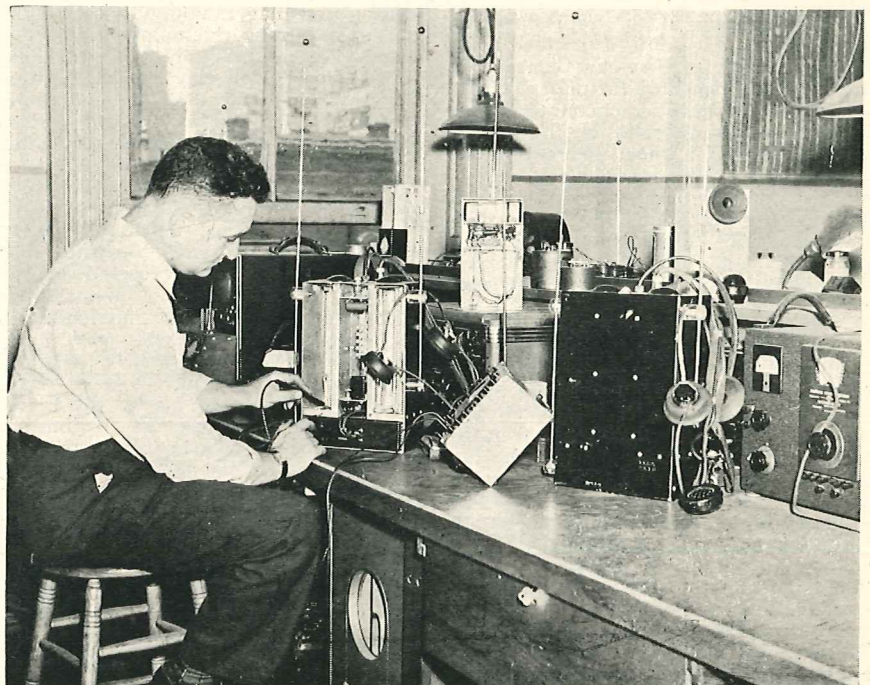
\*\*FIRE ENGINEERING, August, 1945, page 553.

missioner and Chief of Department, Patrick Walsh and other officials of the New York Fire Department, in permitting publication of Fireman Myerson's unofficial log of operations.

UPON receiving signal 2-2-681 (second alarm, box 681, 31st and Fifth Avenue), at 9:55 A.M., the fire radio car responded to the scene of the alarm, where I found the fire to be in the upper stories of the Empire State Building, 33rd and Fifth Avenue.

We reported to Deputy Chief Gerhard Bryant of the 3rd Division—Fireman C. Gertsen and myself—and I was ordered by him to proceed to the fire floors of the building while Fireman Gertsen remained with Deputy Chief Bryant, who was in command of the fire.

I found that elevator service in the building was still being maintained as far as the 67th floor. However, I turned out on the 65th floor as the starting point to investigate conditions and to see if any persons needed medical attention. Contact via our pack-sets was



Original N.Y.F.D. Radio Research Laboratory

Here the Department's pack set radio was developed by Department Technicians Art Meyerson and Samuel Harmatuk.



**Fire Department Radio Pack Set in Operation at Empire State Fire**

Fireman Art Meyerson relaying instructions from Captain Irwin, Supervising Engineer, N.Y.F.D., to locate the building's engineer and have him report to the fire floor. Nine victims were removed from this wrecked office on the 79th floor.

established with Fireman Gertsen at this point.

As I proceeded floor by floor to the 78th floor, I reported conditions as I found them and received acknowledgment from the street level. The search was materially aided by the presence of building employees on each floor who reported to me what conditions obtained. No seriously injured persons were encountered at this stage, and those with minor injuries had been evacuated to the street. This reduction of the life hazard on these floors below the fire area was encouraging. The entire survey procedure took about fifteen minutes, during which time radio contact was maintained.

Upon arriving at the 78th floor and subsequently the 79th, I notified Chief Bryant by way of Fireman Gertsen that the fire had been brought under control. On the 78th floor I encountered His Honor, Mayor Fiorello H. LaGuardia, who inquired if I knew where Commissioner Patrick Walsh could be found. I notified the Mayor that he had last been seen on the fire floor. The Mayor then asked me how the pack-sets were working and I told him that no difficulties had been experienced in their operation.

### Checking High Voltage System

Chief Bryant next ordered me to proceed to the mast of the building, which starts at the 85th floor, inasmuch as a message had been received over the radio set of Rescue No. 1 from the Fire Alarm Telegraph Bureau via Station WNYF, that some people had been injured on the upper floors. On the way up the mast, Fireman Gertsen called me and asked that I investigate the condition of the building's high voltage system, much equipment of which was located on the 82nd floor. This request came from representatives of the New York Edison Company who had reported to the fire scene for duty. I located the building employee in charge on the 82nd floor who informed me that the high voltage system was

unharmful. This message was relayed to the Edison men by Fireman Gertsen.

Upon arriving at the 86th floor, I met the building employee in charge of the mast who informed me that all the occupants of the mast area had been evacuated to the 86th floor and that those requiring first aid or medical treatment had been looked after. There were a number of building tenants and operating personnel on this floor, which is occupied by a cafeteria, and they were quite relieved to learn that the fire below them had been brought under control. (The psychological effect of having a fireman equipped with radio and able to hold conversation with his fellow firemen almost a thousand feet below must have been reassuring to those who believed themselves imperiled by fire, to say the least.—Editor's note.)

All this information was transmitted to Chief Bryant via pack-set.

Acting Battalion Chief W. P. Morris arrived at this time and I notified Chief Bryant. The Chief then had me advise Chief Morris that he was sending three engine companies to the 78th floor to relieve some of the operating companies, and that they, the relieving forces, were being instructed to report to Chief Morris. Soon after this I was ordered to report back to the fire floors.

### Radio a Help in Overhauling

The fire had by now been completely extinguished and overhauling operations had started. Captain Irwin, of the Fire Supervising Service, requested that I locate the building engineer who was understood to be somewhere in the basement or sub-basement of the structure, approximately 925 feet below. I relayed this message to Fireman Gertsen who dispatched a messenger from the street level. When he had located the engineer and so informed me, I relayed Captain Irwin's message to him, requesting that he come up to the fire floor and informing him where he could find the Captain.

(It might be in order to emphasize at this point that radiophone communications, such as were employed at this fire, can be highly effective in overhauling operations, which may require additional personnel, special tools and equipment, and where it may be advisable to transmit records of the finding of victims, valuables, and evidence pointing to the cause and extent of the fire. The author purposely omitted reference to this phase of operations.—(Editor's note.)

During the course of operations several messages were received by telephone at Telegraph Bureau Headquarters for various municipal and government officials who were understood to be at the scene. These were relayed by Headquarters over Station WNYF and picked up by the receiver on Rescue Company No. 1 and then transmitted by packset to the fire area.

Ordinarily, telephone service could have been established to the upper floors in that area, but unfortunately, the telephone lines, which were carried through conduits in the elevator shafts, had been torn out at the time of the crash, so that the only form of communication was by means of the Fire Department pack-set. Later, the Police Department installed telephone service from the 67th floor to the 79th floor.

### Many Army Messages Handled

All the Army messages from the fire

floors to the street were handled by pack radio. Messages to Army officials from both LaGuardia and Mitchell Fields were likewise channeled in this manner.

Assistant Chief Timothy Donovan having arrived and assumed charge of the fire, Commissioner Walsh returned to the street level. The Commissioner was notified of the progress of overhauling operations and shortly ordered that all second and third alarm companies take up. At about this time Assistant Chief Donovan notified the Commissioner that he would require the services of three engine and three truck companies for overhauling, as well as the Rescue Company. The order was then given by Chief Donovan to reduce the high pressure, which had earlier been increased from 125 pounds to 175 pounds. This order was transmitted by pack-set to the street level, and from there by alarm box to Manhattan Telegraph Bureau Headquarters. Records indicate that the latter received this at 11:29 A.M.

During the period these messages were being transmitted, a complete description of the fire and resulting damage had been radioed via pack-set. By this means members of the Department on the street level were kept apprised of conditions prevailing on the upper floors.

Both Firemen Gertsen and I were ordered to take up, at 4:00 P.M., by Chief Bryant, after six continuous hours of operation. It develops that this was the third longest period of operation of Departmental pack-set radio since the system was inaugurated. Pack-sets were used for seven and a half hours at the S.S. Normandie fire, and six and a half hours at the S.S. Algonquin fire.

No difficulties in transmission or reception were experienced except when



**Pack Sets Used on Tall Buildings**

N.Y.F.D. pack sets permit freedom of movement. Note twin antennae and clearance for spade helmet.

operation was attempted from inside the tower. Even under these conditions, some reception was possible, so that either operator knew that he was being called. In addition, the mobility of the pack-sets was an important factor in the results achieved, inasmuch as the operator could proceed to deliver a message, and still be in contact with his partner at the other end. The wisdom of holding the weight of the sets to the minimum was demonstrated by the necessity of climbing many flights of stairs, stooping under and stepping over wreckage, and getting in and out of almost inaccessible places.

The excellent quality of transmission was responsible for the absence of any misinterpreted or misunderstood messages. Most two-way systems suffer from audio distortion, which is not considered important, because code signals are usually used in transmission. By this is meant the use of such qualifying expressions as "T for Thomas," or "P for Peter." However, the speed of message transmission is materially aided if these codes are rendered unnecessary.

Because of the excellent organization in Departmental fire-fighting procedure, the use of "Walkie-Talkies" during the actual period of the fire, and particularly its initial stages, could not have aided materially except where extraordinary conditions arose which called for more manpower and additional lines. These conditions could have been met even though the pack-sets were not on the fire floors inasmuch as the chief officers had been apprised of their location and service while I was investigating the other floors. Their greatest use at this particular fire was subsequent to its extinguishment. The fact that they were in use continuously from 10:00 A.M. to 4:00 P.M. is evidence that they performed a needed service.

### History and Technical Details

The New York Fire Department's radio communication system, Station WNYF, made its bow on May 27, 1936. Originally designed as an emergency means of intercommunication between fire headquarters and units of the Marine Division, its scope has since been considerably broadened.

Today, operating on a frequency of 1,630 kilocycles, Station WNYF's messages are heard at all hours in every fire station in the city, as well as over various receivers in the fire, police and other services. Two-way radio installations have been fitted in official automobiles of top-ranking officers of the Department as well as on the apparatus of the rescue companies.

However, this type of equipment only partially solved the problem of communications at the fire scene. The need for mobile methods of communication covering the fire area and for facilities that would insure effective voice communication between the upper stories of the city's skyscrapers and the ground level was imperative.

In September, 1939, under the guidance of John J. McCarthy, Assistant Chief of Department in Command, a radio laboratory and workshop was fitted out in East 67th Street, above the quarters of Engine 39 and Hook & Ladder 16. Firemen Samuel N. Harmatuk—later to enter the armed forces—and Art H. Meyerson, both of Engine 31, were detailed to investigate further applications of mobile radio communication to fire-fighting.



**Radio Serves at Empire State Crash**

Fireman Gertsen receives reports from radio operator Meyerson speaking 1,000 feet above.

Primary experiments involved the development of pack radio equipment for transmission of messages within the fire area. Research included studies of all available commercial equipment, practically all of which at the time were found inadequate for fire use in one or more details.

### Standards Developed by N.Y.F.D. Pack Sets

As a result of the research and experimental work conducted by the Fire Department technicians, the following standards were developed, for this type of portable radio communication sets:

1. Light weight
2. Compactness
3. Simplicity of operation
4. Long operational life
5. Freedom of operator's hands
6. Pack-to-pack operation
7. Sturdy, foolproof, and reasonably waterproof
8. Dependability
9. Sufficient range to cover area
10. It must be easy to service and adjust.

The two-way pack-set now used by the Department, more popularly known as "Walkie-Talkie," although not the last word, has successfully weathered numerous working tests "under fire" in addition to that described herein.

Briefly, the set now in use operates on an assigned frequency of 117,550 megacycles (ultra high frequency), measures  $9 \times 5 \times 13\frac{1}{2}$  inches, and weighs  $13\frac{1}{2}$  pounds. It has an operating life of from sixty to 100 hours, from a self-contained dry battery, and a maximum range under ideal conditions of from two to three miles. The circuit, a development of the New York Fire Department's Radio Laboratory, uses three tubes. One control, easily accessible, turns the set on or off, switches from "transmit" to "receive" and regulates

the volume in the "receive" position. This type of operation is known as "simplex," which means that all transmission and reception is on the one frequency, and any pack-set can operate with any other pack-set in the Department. The sets are mechanically sturdy, waterproof and have never failed to operate at a fire.

Two years ago the Laboratory began experimenting with a smaller unit of the hand-set type for use by chief officers. This midget two-way set measures  $5 \times 10 \times 3$  inches and operates very much like a French hand telephone. It is carried suspended from a waist belt when not in use and weighs considerably less than five pounds. The battery is suspended from the back of the same belt, resembling a grenadier's pouch in appearance. Its operating life is the same as the pack-set, and its range is slightly less, but still capable of covering the fire area.

### Nassau Chiefs Hold School

The Institute of Nassau Fire Officers held what may mark an innovation in fire service training, on the nights of September 18, 19 and 20 inclusive, at Hofstra College, Hempstead, L. I., N. Y. The training course was sponsored by the Fire Chiefs Council of Nassau County under the direction of the Institute Committee, Wilbur E. Seaman, fire marshal, chairman; George W. Clough, County Fire Marshal, vice-chairman and Messrs. Clowes Ross, Taff, Eiser, Stevens and Zerucha.

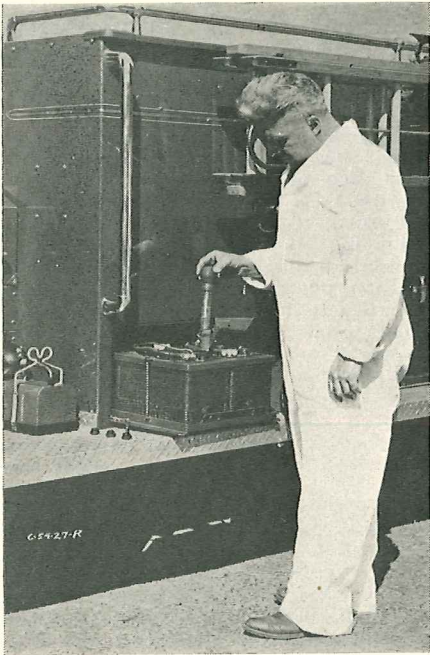
Sessions, which lasted from 7:30 p.m. each night until nearly midnight, were held in the spacious gymnasium of the College, and in general, were conducted along the lines of the annual Fire Department Instructor's Conference, Memphis, even to the traffic "stop-and-go" speakers signals.

Speakers on the program were: Chief Michael Zerucha; Rev. Arthur J. Pennell, invocation; Chief Mario A. Pollini, president, Chiefs Council, greetings; Hon. J. Russel Sprague, County Executive; Chairman Joseph W. Timberman, Fire Commission; Dr. John Cranford Adams, President, Hofstra College.

Also lecturers, Chief James Just, University of Maryland, topic: "What a Fireman Should and Should Not Know About Insurance Rates and Underwriters Labels"; Fred Shepperd, Editor, FIRE ENGINEERING, "The Post War Fireman"; Dr. William Arthur Ross, U. S. Office of Education, "This Thing Called Leadership"; Deputy Chief William H. Taubert, New York Fire Department, "Taxpayer Fires"; Charles S. Black, Chief Operator, Automobile Underwriters Detective Bureau, "Automobile Fires"—a motion picture.

Chief Samuel J. Pope, Boston Fire Department, President of the International Association of Fire Chiefs spoke on the topic: "Fire Chiefs—Post War Era"; Chief Rudolph H. Swanson, Jamestown Fire Department, President, New York State Association of Fire Chiefs spoke on "Post War Planning in Fire Departments" and Calvin Lauber, Engineer, National Board of Fire Underwriters, discussed "Water Spray Nozzles, Including Fog Nozzles, for Fire Fighting Use."

The sessions were attended by fire officers from not only Nassau but many other counties throughout the state.



On New Models of American-LaFrance Apparatus, Battery Slides Out for Testing

pumps are contained in the new design. These include all-bronze housings; bronze impellers; stainless steel shaft; all ball-bearing construction; replaceable seal rings in the eyes of each impeller and in the housing and automatic packings.

A new exhaust ejector primer is announced as another feature. The only moving part in the entire priming system is the valve in the exhaust line that deflects the exhaust gas through the primer when it is desired to prime the pump.

#### Standardization

All post-war models will have the same front-end design for seating arrangement and engine location and the same seating arrangement applies whether open or cab type is required.

The whole cab unit is mounted on rubber which frees the cab from any frame distortion that might result from traveling uneven surfaces. It also eliminates any warping of the doors.

The new seating arrangement further removes one of the objections found in previous canopy cab arrangement. This involved a loss of load carrying capacity of the hose body because of the aisle that was required.

As far as possible, standardization has been carried to the limit. As an example, engines—that is, all motive power—are interchangeable in all models.

Further simplicity and refinement—and accessibility—are evidenced in the new battery arrangement. The batteries are mounted on a sliding track which permits their visual inspection and the ready use of hydrometer. Batteries are located so as to provide extremely short leads to the starting motor. This, in turn, is operated by remote control from the instrument panel in the driving compartment.

Finally, the overall length of pumpers has been reduced somewhat—from 25 feet 11 inches to 24 feet 10 inches on the 750 G. P. M. pumpers, and 26 feet 4 inches to 25 feet 8 inches on 1,000 and 1250 G. P. M. models.

## Recovers from 70-Story Drop

On July 28, a bomber crashed into the Empire State Building, killing fourteen persons and injuring many more. Most critically hurt of the survivors was Betty Lou Oliver who, with the elevator she was operating at the time of the crash, fell from above the seventieth floor to the basement.

Firemen and building employees who rescued the suffering girl from the wreckage marveled that she could still be alive. In the hospital her life was despaired of for days and it was said that if she ever recovered she would never walk again; she had a fracture of the spine.

On Tuesday morning, November 27th, almost four months to a day from her terrifying plunge, Betty Lou took her first steps, albeit with the aid of crutches. By nightfall she was so adept that she was able to promenade down the corridor of Bellevue Hospital, Manhattan, with her husband, Oscar L. Oliver, Navy torpedoman third class.

Mr. Oliver's home is Fort Smith, which he left to join the Navy, while Betty Lou departed for New York to take a wartime job. The husband was on the destroyer Haggard in the Pacific when the Empire State disaster occurred and was flown home on a thirty-day emergency leave, which subsequently developed into an assignment for shore duty in New York City.

The couple plan to make their home for the next five years in Philadelphia while Mr. Oliver studies architectural engineering at the University of Pennsylvania.

## Chief Palmer Urges Strengthening of Fire Department

Fire Chief Hendrix Palmer, concerned that no mention was made for fire expansion facilities in Charlotte, N. C., in the initial report of the Charlotte Planning Board submitted Nov. 12, wrote Chairman C. W. Gilchrist and outlined the necessity of including an extension of the fire department program for "Greater Charlotte."

Already the city of Charlotte is suffering from "growing pains," and newcomers are turned away because they are unable to find housing. Although the city is pushing its residential building projects with energy, the Planning Board failed to include the Fire Department in its program outlining the taking in of more territory and the building of more homes.

Fire Chief Palmer had been ill in a Charlotte hospital, but when the Planning Board report was made public he put on his fighting togs, girded for battle, and here is the gist of what he wrote Chairman Gilchrist:

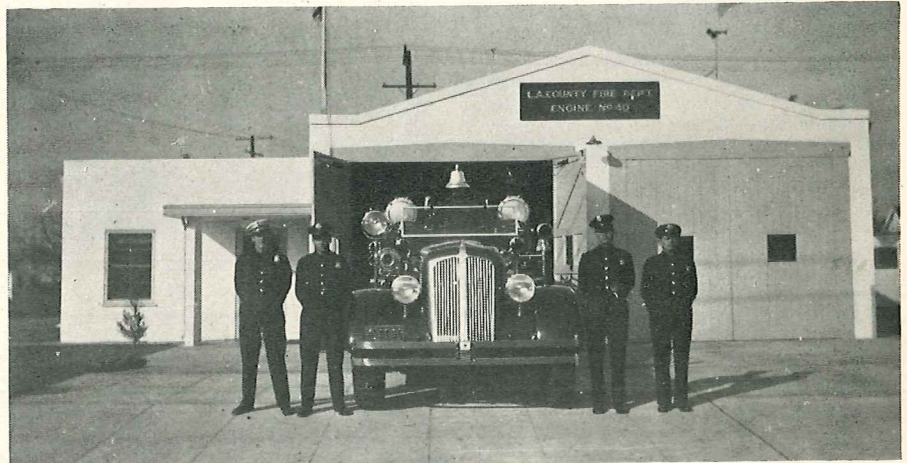
"If the city limits are extended, and that is a subject on the Planning Board's calendar, the Fire Department will be called upon to provide service in these new areas, and I am afraid all the available bond funds will be exhausted and the city will be unable to immediately finance the newly required protection.

"With extension of the city limits and inclusion of new territories in the boundaries of the city, the Fire Department will have added responsibilities, which will require additional equipment, and perhaps more stations.

"The National Board of Fire Underwriters will soon be coming back to Charlotte for a survey of its fire protective measures, and unless the department keeps pace with the growing demands, the city is liable to be penalized in its fire insurance rates. If the Fire Department is found to be insufficient in men and equipment to take care of added areas, then the fire insurance rate will be boosted with a penalty charge, and this will hit the pocketbook of property owners.

"At the moment the Charlotte Fire Department is handicapped by manpower shortage, which has been met only by the willingness of the firemen to sell their vacations and their days off by working at those times and receiving added compensation. Thirty temporary men have been employed to take the places of the 31 regular members of the Department still in the armed forces, and many of these are good fighters, whose services should be retained in the post-war period."

—D. G. SPENCER



#### Modern Los Angeles County Fire Station

Los Angeles County, which boasts what is perhaps the largest county fire department in the nation, houses some of its many fire companies in up-to-date stations. One of these is that of Engine Company 40, which is located in Pico, Calif. According to Glen Alton, Whittier, Calif., who forwarded the illustration, the station houses a Seagrave 600 GPM pumper with 185 HP motor, and a 600-gallon water tank.