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"Communications and Fire Alarm Systems"

A History of Alarm and Box Circuits in
City of Oakland

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The earliest mention of alarm circuits in the City of Oakland is an article in the Oakland Tribune, 1887, which describes a telegraph line constructed in May 1870 by the Captain of Police, F.B. Tarbett, at his own expense. It consisted of four miles of wire linking five stations equipped with Morse paper registers and keys, and was used "for fire and police purposes," by the police officers who were required to know Morse code. The powers that be were evidently favorably impressed by this, for they purchased it from Cpt. Tarbett in 1873 for \$800.00.

Shortly thereafter, George H. Carleton was placed in charge of developing a fire alarm circuit separate from police lines. In 1874 and 1875, \$242.38 and \$1,230.30 was delegated respectively towards this end, and labor was provided from the city prison. However it was not until 1876 that eleven patent, noninterfering fire alarm boxes were purchased for \$250.00 each, the first in the city.

In 1878 a large fire bell was installed in a tower at City Hall (Central Fire Alarm) with an electric repeater, transmitting alarms at one blow every two seconds. On quiet days, this bell could be heard over most of Oakland (as it was then)-- alerting the extra-men attached to the companies and also the general citizenery. A 1877 business directory listed thirteen fire alarm box numbers and locations. These original boxes were locked-- a sign on the box gave the location of the key at a nearby business or residence. Forty-four alarms were received in the next year, two of them false.

The Oakland Daily Times described the 1879 fire alarm system:

The boxes, of the latest, improved American fire alarm pattern, are placed at the intersections of the streets, the keys being left at the grocery store or other public places nearby. These boxes are distributed

pose in one of the city parks." Per N.F.P.A. 73 of noncombustible materials in the Communication Center, the interior finish was of marble and concrete; the transmitting pedestals, switchboard, and test desk, which at first glance appeared to be finished walnut, were actually cleverly painted sheet metal. An early "computer floor" was part of the design-- "a checkerboard plan, with traps set in the concrete floor... any part of the room may be reached from any other part without expensive cutting of floors."

The fire alarm equipment itself was a type B system with twenty-four alarm circuits, twelve for a high-speed tapper signal, which operated a punch register, and twelve for a gong signal at much slower speed. The watchman would check the tapper signal, and if his house was not due, would shut off the gong circuit so no one was disturbed.

With the move, the fire alarm box system was expanded. In 1912, there were 231 boxes; in 1914, 279; and in 1915 alone, the city manufactured and installed 100 boxes. In that year, 1066 alarms were received; 498 by box, 568 by telephone. The emergency battery power supply for fire alarm headquarters was now supplemented by a gasoline generator.

By 1920, the equipment had been modified from a type B to a type A system and the electrical department shop was making considerable headway in replacing both the original old City Hall instruments and the older fire alarm boxes. In 1910, thirteen of 170 boxes were of city manufacture; in 1920, 549 of 632 were.

The fire stations now possessed a large gong, stop clock, and a relay to dormitory bells, horse release, and station lights on the gong circuit, and a tapper and a relay to a tape register

all over the city, and as systematically as possible. Lines of wires, placed on high poles, and never on buildings, run from these boxes to the central office at City Hall... This necessitates four circuits, all converging at a instrument in the office of the Superintendent. When a alarm comes in from a box on either of the four signal circuits, this instrument automatically repeats the alarm to the remaining circuits, which connect with the large bell at the City Hall and smaller bells on the engine houses, the gongs, and other apparatus used for repeating and registering the alarm... thus giving the alarm to the volunteer firemen who are always on hand to assist in removing goods, throwing spittoons and marble mantles from three-story windows and similar acts of benevolence, until stopped by the police...

The Fire Department annual report for 1879 lists twenty-one boxes in operation on approximately thirty miles of wire, three fire bells, three small and four large gongs. Also in the report, the Superintendent describes the repeater system as "much less expensive than the central office system" as it "excludes the keeping of a force of operators in the office day and night." This trusting attitude would prevail for the next thirty years.

From 1877 to 1884, eight more fire alarm boxes were purchased for sums ranging from \$150 to \$225 each. Thirty-eight of these early boxes were still in service in 1932.

By 1909, there were 157 fire alarm boxes, still locked, on twelve box circuits of aerial wire. Oakland's population was then 150,000, covering sixty square miles. Part of this growth was due to an influx of permanent refugees from the 1906 San Francisco earthquake; perhaps their demand for fire protection influenced the gradual conversion of the locked fire alarm boxes to a break-glass variety over the next two years. A certain offshoot of the 1906 diaster was the move of Central Fire Alarm in 1911 from the third floor of the old brick City Hall to "an isolated fireproof steel and stone building of classic design, erected for this pur-

on the tapper, or joker circuit. The equipment on the relays was open circuit on local batteries; probably the power supply at fire alarm headquarters was not sufficient to do otherwise. Some circuits also ran from fire stations to remote tappers in firemen's homes.

In 1922, the fire alarm headquarters equipment was modernized to its present basic shape. Both joker and gong circuits now transmitted at the same high speed. Common battery power supply was instituted on three box circuits. The open circuit registers had been phased out from all but four stations. All of the city's 771 fire alarm boxes had a four-digit number, which corresponded to a district grid; prior numbering had been random with 1-, 2-, and 3-digit boxes. In 1919, 1,767 alarms were received; 871 box, 745 telephone, 20 A.D.T., 133 false. In 1924, there were 2,158 alarms; 1,044 box, 960 telephone, 123 verbal/in person, 26 A.D.T., and 196 false. Reports of building fires received by telephone did not warrant the same response as a pulled street box; this policy continued at least until 1947.

By 1933, the Electrical Department had completely replaced the old Gamewell headquarters equipment with their own. Of the 922 boxes in the city, 778 were made in their shop. In this decade, the power supply became all common battery and all the open circuit registers were removed. A double-punch tape register was developed and manufactured by the Electrical Department. Tape signals were transmitted over both the gong and joker circuits, to provide a duplicate register signal.

Four battalion chief's cars were outfitted with two-way radios in 1947 and \$7,500 was allocated for the purchase of fifty mobile radios. It is difficult to realize how much the two-way radio

dominates today's fire service communications, but prior to the installation of these radios, when a company left its station house, it passed into a communication limbo. The only possible mode of communication was the city-wide fire alarm box system and its telegraph keys and sounders. Telephone jacks were standard on the boxes after 1920 and Chiefs and Chief's Operators carried handsets. However the box circuits were not voice quality and for vital messages, a set of coded telegraph signals were used.

From the 1920 Fire Alarm Manual:

F-21. Typical Chief's out of service signal from a fire alarm box:

Signal: #5 Chief out of service at Box 325:

| | | | | | |
|-----------------------|----------------|-------|-------|-------|-------|
| Chief transmits | 1-2-1 | - | - | - | - |
| F.A. Operator replies | 1-2-1 | - | - | - | - |
| Chief transmits | 5-8-3-3--3-2-5 | ----- | ----- | ----- | ----- |
| | --- | --- | --- | --- | --- |
| F.A.Operator replies | 5-8-3-3--3-2-5 | ----- | ----- | ----- | ----- |
| | --- | --- | --- | --- | --- |
| Chief transmits OK | 2-1-2 | -- | - | - | - |

A Chief's out of service signal followed by a box number as shown above shall not be transmitted over joker circuits. This signal indicates the Chief is still in service but is leaving that particular location.

F.26. Typical call for ambulance from a fire alarm box:

Signal: #1 ambulance go to Box 136:

| | | | | | |
|----------------------|-----------------|-------|-------|-------|-------|
| Chief transmits | 1-2-1 | - | - | - | - |
| F.A.Operator replies | 1-2-1 | - | - | - | - |
| Chief transmits | 1-10-5-5--1-3-6 | - | ----- | ----- | ----- |
| | ----- | ----- | ----- | ----- | ----- |
| F.A.Operator replies | 1-10-5-5--1-3-6 | - | ----- | ----- | ----- |
| | ----- | ----- | ----- | ----- | ----- |
| Chief transmits OK | 2-1-2 | -- | - | - | - |

The F.A. Operator then calls up the police station and dispatches an ambulance to the location given.

By 1939, a system of high-pitched tones also transmitted alarms over box circuits monitored by handsets in the field.

The present-day 'Silent System' was first experimented with in 1951, although the I.S.O. report for that year credits it with delayed alarms. In its final version the secondary circuit is

switched over at night to turn on only the station house lights instead of ringing the gong. The city is divided into seven districts and Fire Alarm transmits a blow on the secondary circuit of the districts due immediately before the transmission of a box. At this time there were 1,196 boxes, 1,150 city-made.

All city-manufactured boxes were modified in 1958 to include an emergency ground-return feature. The only remaining difference now from the Gamewell boxes was that the city boxes might not transmit a complete four rounds just before they wound down, and they would not produce a ground on the circuit if they did.

Presently in the city of Oakland, there are twenty-four alarm circuits. The first twelve are the primary or joker circuits which operate the registers; the second twelve are the secondary or gong circuits, which no longer operate either the registers or the gongs (removed 1972-73) but still control the 'Silent System'. There are three box circuits remaining with seven auxiliarized dead-front boxes connected to some municipal building fire alarm systems. Both alarm and box circuits are supervised for under and over current by hand-wound relays connected to a separate trouble battery power supply. There are provisions for placing the circuits above ground when crossed with foreign battery via a motor-generator; the box circuits have provisions for emergency ground-return by a double battery power supply. Some 1300 fire alarm boxes were removed and sold by the city in July, 1978 due to rising maintenance and false alarms.