

TELEPHONE EMERGENCY REPORTING SYSTEMS

GENERAL

An emergency reporting system is a telephone arrangement for use in notifying the proper authorities in a community or industrial organization of the need for aid in case of fire, crime, accident or other emergency:

Municipal — To summon the aid of city departments and public agencies in event of emergencies such as fire, accident, injury, explosion, water main break, storm damage, burglary or enemy attack.

Industrial — For fire, watchman, general emergency and plant protection reporting.

In the municipal field, there is growing recognition of the need to make all emergency services directly available to the public through a centralized system which can handle all types of emergencies. The control center plan also brings about closer coordination between the various protective agencies in the municipality.

A municipality may sometimes find it difficult to meet an urgent need for modernizing their emergency reporting facilities and extending them into newly developed areas because of the need for capital funds for expanding other essential services. A telephone company emergency reporting system requires no large capital investment on the part of the customer. The service can usually be provided at considerably less cost than that of overhauling or replacing an existing worn out customer-owned signaling system or of moving such a signaling system center to a new location. The customer obtains a high quality of maintenance service without the expense of operation of maintenance personnel, often a substantial expense item in municipalities. The system can be readily expanded as a community grows.

Voice reporting of emergencies (by telephone) has distinct advantages:

Dispatcher can obtain specific information on location and nature of trouble so that the proper amount and type of both personnel and equipment can be dispatched to the scene. This also reduces the expense and hazard of moving unnecessary aid in particular cases.

Protective personnel in the field can easily maintain close contact with their offices by telephone and make routine reports regularly.

TYPICAL SYSTEM

The usual telephone type of emergency reporting system consist of:

Emergency reporting telephones located at strategic points, (for example, at street intersections in the case of a municipal system), and served by switchboard at a central control point.

Communication facilities at the control center (telephone, teletypewriter, radio) for transmitting reports of emergencies to the proper protective agencies.

The reporting telephones are generally outdoor types which are connected by individual PBX station lines to a PBX switchboard at the control center. The switchboard may be the regular type modified, or a special type designed and used exclusively for emergency reporting purposes or associated with both administrative and emergency reporting stations. The combined use may be more practical in a medium-size or small community.

In connection with the use of an emergency reporting system by a municipality for fire reporting purposes, the city officials may or may not want to provide all of the special features which are required to meet the standards for a telephone-type fire reporting system which have been established by the National Board of Fire Underwriters. The extent to which the city officials may want to provide special features may be a matter of economics.

While the telephone company emergency reporting systems are designed to meet the critical requirements of municipalities and industrial organizations, the company assumes no responsibilities or liabilities in connection with the operation or efficiency of any system furnished to customers.

DISPATCHING ARRANGEMENTS

Fast communication facilities are required at the control center to dispatch personnel and equipment to the scene of the emergency reported.

With respect to the handling of fire alarms the National Board of Fire Underwriters specifies that alarms should be transmitted to fire stations over two separate and distinct circuit facilities, one of which should be a supervised metallic circuit for coded signals or symbols for graphic recording. The other circuit may be arranged for transmission of coded signals, symbols for graphic recording, or voice through radio or

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DISPATCHING ARRANGEMENTS (continued)

wired amplification circuits. When voice circuits are used, an acknowledgement signal is required such as a circuit with key to operate a bell signal.

Cities with telegraph-type alarm systems usually have dispatching facilities for transmission of telegraphic signals recorded on a tape which is deciphered at the fire stations. In addition, the alarm is also transmitted over a loud speaker channel or by radio.

Dispatching facilities furnished by the telephone company may provide for:

- Loud bells or other tone-alerting signals before each message.

- Private live teletypewriter service as a means of transmitting "symbols for graphic recording." (Teletypewriter service not only provides a written report to confirm each alarm but also a means for routine communications.)

- Radio dispatching or loud speaker paging type facilities for transmitting instructions by voice.

- Off-premises PBX stations from the control center switchboard to aid stations.

Selective calling arrangements may be provided to permit calling any one or a group of points to receive dispatching instructions.

CONCENTRATOR EQUIPMENT

For use in large cities, an arrangement for concentrating reporting lines at the central offices to a few trunks at the PBX is under development. The concentrator equipment for use with emergency reporting systems has a capacity of about 200 lines and four trunks, and has the features of (1) continuous line test and (2) indication at the switchboard of station locations. This concentrator is being designed primarily for use with 520A switchboard.

520A SWITCHBOARD

The 520A switchboard (see exhibits) is designed for use in emergency reporting systems. It is a two-position, six-panel metal unit with a sloping face panel. The framework of the switchboard, as well as the key shelf and face equipment are gray. The switchboard is 4' 2" high, 5' 6" wide and 3' 2" deep (back to key shelf front).

The 520A has a capacity of 400 reporting lines, 20 central office trunks, 37 paging lines for dispatch purposes and 40 annunciator and status lamps (used to indicate the availability of fire fighting apparatus as described later).

Provided with the switchboard are two attendants' telephone circuits arranged for connection of a recorder connector to permit voice recording of emergency calls, eight reel-type double-ended cord circuits, two dials, and a hand generator. The attendants' telephone circuits can be grouped so that the switchboard may be operated by one or two attendants.

Each reporting line and trunk terminates in the face of the switchboard on both a push-button type key and a jack. Line lamps and designation strips are provided. The line lamp at the jack appearance is located behind the translucent designation strip while at the key appearance it is placed so as to illuminate the plunger of the push-button type key. An additional lamp for each reporting line is placed behind the designation strip at the key appearance to indicate line troubles.

One attendant can operate the switchboard by using the push buttons to answer calls. Calls may be transferred to other stations or trunks by use of the jacks and cords. During periods of heavy traffic the switchboard may be arranged for operation by two attendants. Each attendant has a full appearance of all lines and trunks.

All reporting line push-button appearances are located in the right and left panel sections. The panels of the center section contain the corresponding jack appearance of these lines, as well as the key and jack appearance of the central office trunks. The center section may also contain paging line keys, status keys, tie trunk key and jack appearances and key and jack appearances of other miscellaneous circuits.

520A FEATURES

REPORTING LINES—The 520A reporting line is designed for locked-in-seizure. Once the handset of a reporting telephone has been removed from its switch hook, the line lamp flashes and continues to flash until the attendant answers, even though the handset may have been replaced on the switch hook. During the interval that the person calling is awaiting the switchboard attendant to answer, audible ringing tone is applied to the line to assure the person calling that the line is not "dead."

The line circuit is also arranged to provide continuous electrical supervision of the cable facilities and station instrument including the handset and handset cord.

TELEPHONE EMERGENCY REPORTING SYSTEMS

520A FEATURES (continued)

An "open" or "ground" occurring on this circuit will light a station trouble lamp and sound an audible signal.

When the reporting line is connected to a tie line the delay feature, the locked-in line lamp, and electrical supervision features are not used.

Two flash-and-wink units are provided to flash the line and trunk lamps. The even numbered lines are connected to one unit and the odd numbered to the other. Operation of a flash transfer key will connect all lines to either of the two units.

VOICE PAGING—Some emergency reporting systems require one-way voice paging lines to other locations, such as fire houses, to permit dispatching of fire fighting or other emergency apparatus. A relay unit controlled by push-button keys located in the center section of the 520A switchboard permits the attendant to select a line or several lines and connect the attendant's telephone to the input of the paging amplifier and connect the output of the amplifier to the lines selected.

A button is pressed to place an alerting tone on the circuit before voice transmission is started. An all-call key is provided to permit selection of all paging lines for general announcement purposes. A paging jack is also provided to permit remote announcing stations to be connected to the paging system by means of the cord circuits. When the paging jack is used, selection and connection of the paging lines to the paging jack is performed by the attendant by pressing the key associated with the line desired.

ANNUNCIATOR AND STATUS LAMPS—Annunciator and status lamps may be provided to notify the 520A switchboard attendant of the operational condition of fire fighting or other emergency apparatus.

The annunciator lamps are connected via a local signaling channel to the fire houses. These channels may terminate at the fire houses in a key or other device, which when operated by fire personnel or by movement of the fire apparatus light the annunciator lamp. This lamp signal is used as an acknowledgement to dispatched messages or as a means of notifying the 520A switchboard attendant that emergency equipment is out of service or has responded to an alarm.

A status lamp associated with each annunciator lamp is controlled by a key at the 520A switchboard. It is used by the attendant to maintain a visual record of various items, such as to indicate that radio contact has been established with fire apparatus in transit to a fire.

Both lamps may have a second appearance on a wall mounted map of the city to provide the dispatcher with an easy means to determine the over-all status of emergency apparatus.

SELECTIVE ROUTING—An optional selective routing feature permits members of the police force to route their calls directly to a 520-Type PBX at police headquarters by holding operated a push-button type key in the 570 type telephone before removing the handset from the switch hook and holding the key operated until the handset is removed from the switch hook. A busy back tone is placed on the line toward the 520A switchboard at the control center to indicate the line is in use for police business.

Once a connection to police headquarters has been established releasing or repeated operation of the routing key in the station instrument will have no effect upon the established connection. After completion of the call and the handset is replaced on the switch hook or if the calling party flashes the operator, the circuit restores to the normal condition and all subsequent emergency calls are routed to the control center switchboard.

The circuit used with the selective routing feature at the police switchboard contains the same features as the reporting line circuit used at the control center switchboard with the exception that continuous electrical supervision of the cable facilities, the locked-in line lamp feature, and line trouble lamps are not provided.

CALL RECORDER—An optional call recorder may be used to record calls received from reporting stations as required. Operation of any reporting station line relay automatically starts the recorder without the assistance of the 520A switchboard attendant. The recorder identifies the line and prints a ticket containing the assigned line identifier switch position number, month, day and time of day (hours, minutes and tenths of minutes based on a 24-hour clock). The printing of each ticket requires about three seconds after which the recorder is free to record a second call. Tickets are printed on each call until the attendant answers.

Provision is made to store up to ten calls simultaneously: one call per horizontal level per vertical file on a crossbar switch (one hundred line circuits are assigned to a hundred point switch). Should several calls be originated at the same time, the recorder is arranged with a lockout feature which assures the recording of all calls, even if a line in trouble seizure occurs.

A device is provided which indicates when the paper supply is low by sounding the common trouble alarm.

TELEPHONE EMERGENCY REPORTING SYSTEMS

520A FEATURES (continued)

VOICE RECORDING—Voice recording equipment may be connected to each PBX attendants telephone circuit to permit recording of all calls received at the switchboard. A recorder connector, which produces an automatic "beep" tone at about 15-second intervals, is required to couple the recording equipment to the attendant's telephone circuit. The attendant may exclude recording of non-emergency calls by holding a non-locking recorder cut-out key in operation during the conversation.

520B SWITCHBOARD

The 520B (see exhibits) is a single position 100-line emergency reporting switchboard with the same features of the 520A, including reporting line, central office trunk, and call recorder relay equipment. The 520B and the 520A may be used together in the same reporting system.

Besides the 100 reporting lines, the 520B has capacity for:

- 20 central office trunks and tie lines
- 20 annunciator and status lamps
- 17 paging line selective keys
- 4 double-ended reel type cords

Plastic designation strips associated with the annunciator and status lamps must be omitted to obtain the full capacity of 100 reporting lines. When the designation strips are used, the capacity is reduced to 80 reporting lines.

570-TYPE OUTDOOR TELEPHONE

The 570-type telephone is designed primarily for use with emergency reporting line circuits of the 520-type PBX on the basis of an individual line per reporting station. However, the 570 may be adapted for use with other types of emergency reporting line circuits.

A handset type of instrument, the 570 is housed in a cast aluminum box (see exhibits). The word TELEPHONE is cast into the top of the box. The box, equipped with two doors on the front, is colored red, and equipped with decalcomanias inscribed vertically with the word FIRE on the sides of the doors.

The right-hand door covers the telephone equipment compartment and a plastic water-proofing shield, held in place with clips, is provided behind the door. The left door is equipped with a handle, with the words PULL TO OPEN cast in it. This door is spring equipped to make it self-closing.

The front of the set is unsigned to permit application of appropriate signing in accordance with the customer's particular needs.

A push-button non-locking type key is an important feature of the 570. When equipped with this key, the station may be used by the police for calls to police headquarters. A call will be routed to police headquarters when the key is held pressed down before lifting the handset.

ARRANGEMENTS FOR SMALL COMMUNITIES

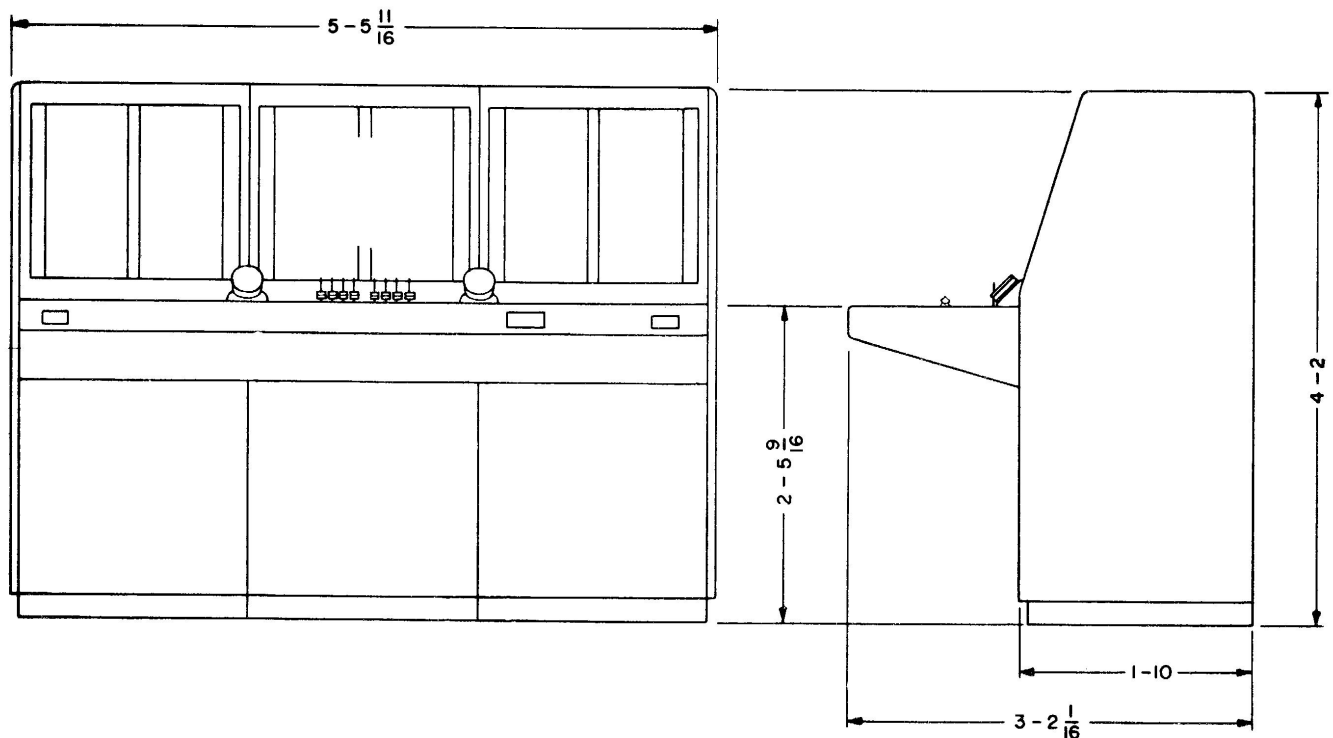
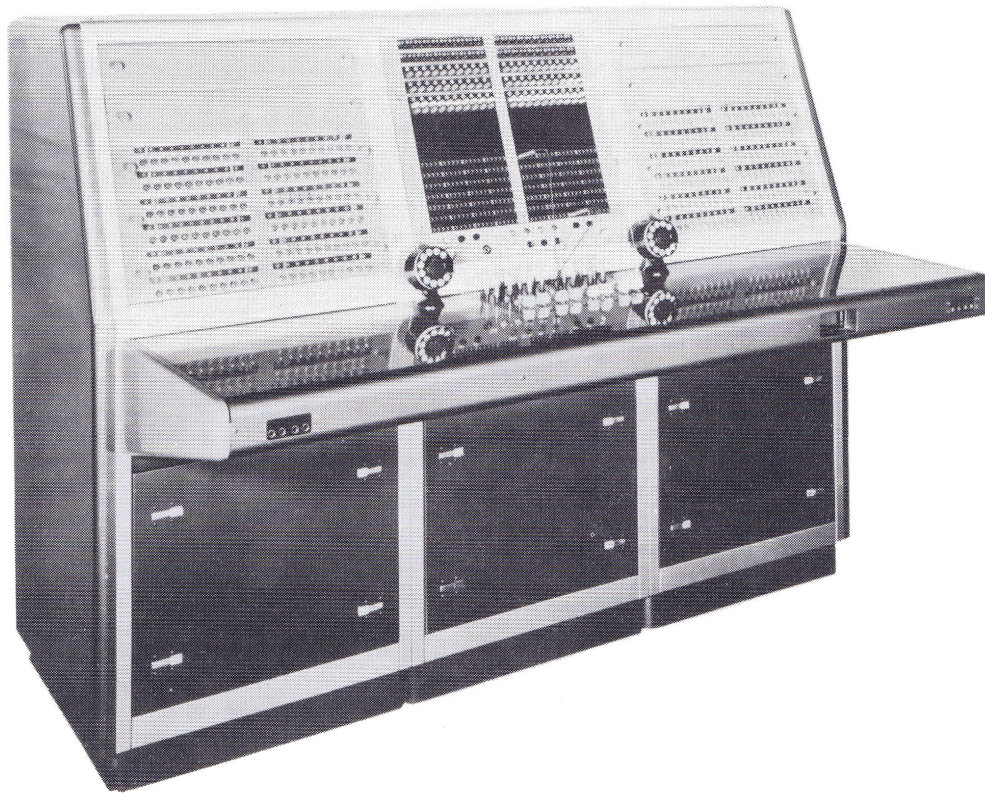
Special telephone arrangements may be provided in small communities with volunteer fire departments which do not have firemen on duty at the fire station at all times. Such arrangements are engineered locally to meet the individual requirements of the community and the type of central office (manual or dial).

Such emergency reporting arrangements usually include a listing of an emergency telephone number in the telephone directory and a means whereby a number of special telephones located at different residences and businesses ring when a call is placed to the emergency number. The community siren may be actuated from any one of several locations where the emergency call is answered.

Proposed telephone arrangements for volunteer fire departments should be carefully reviewed at the division and the area level before any recommendations are made to customers.

520A SWITCHBOARD

Capacity 400 Lines



520A PBX SWITCHBOARD DIMENSIONS

OPERATION OF 520A PBX

To originate a call from a reporting station the person calling opens the door of the reporting station telephone set and lifts the handset. This action results in operation of the locked-in line lamp feature with a seizure of the line circuit at the fire switchboard. Audible ringing is heard by the calling party. The line lamps at the key and jack appearance of the line at the switchboard begin to flash and an audible signal sounds. The line lamp at the key appearances of the line is located so that the plunger of the push-button answering key is illuminated. Both the audible and visual signals remain locked in until the call is answered.

The attendant has a choice of *two methods of answering the call*. He can operate the push-button answering key associated with the line and begin conversation or he can insert a back cord of a cord pair into the line jack and operate the talk key.

After the call is answered, the line lamps cease flashing and burn steadily. Upon completion of the call the attendant releases the line circuit and disconnects his telephone circuit from the connection by pressing the common line release button. A lamp is associated with this button to indicate to the attendant when the calling party hangs up. If a cord was used to answer the call removing the cord from the jack after the calling party hangs up will release the line. If the attendant releases the circuit before the calling party hangs up, the line will be resealed and it will be necessary to reanswer the line to release the locked-in line signals.

Some calls from reporting lines will need to be extended to PBX's and stations outside of headquarters. These calls can be connected through using a cord circuit. The procedure would be to insert the back cord into the line jack and the front cord into the desired trunk. Signaling the distant PBX would depend upon the type of trunk used, either on an automatic or ring down basis. Calls may also be extended to other reporting lines in the same manner.

Extending a call by means of the cords frees the position circuit so that the attendant may answer other calls.

The attendant may originate calls to other PBX's over tie trunks by inserting a front cord into the associated trunk jack and operating the talk key of the cord pair. This action will signal the distant switchboard if automatic signaling is used. When ring down trunks are used it will be necessary to operate the talk key of the cord pair momentarily to the ringing position. An alternate method of signaling is to depress the push button associated with using tie trunks automatic signaling and if ring down signaling is used a common ringing button (RING) is then operated.

The *central office trunks are both key and jack ended* and equipped with a holding feature. On incoming calls the trunk lamp flashes and upon answering by pressing the push but-

ton associated with the trunk or inserting a cord into the jack the lamp burns steadily. When an incoming call is to be held, the attendant presses the hold button. This action disconnects the position circuit and changes the steady trunk lamp to a winking condition. To be reconnected to the trunk, the attendant reoperates the trunk key or reinserts a cord. An out-going call may be held in the same manner and receive the same supervision. Calls may be originated over dial central office trunks by inserting a front cord in the trunk jack, operating the talk key of the cord pair and dialing the desired exchange number.

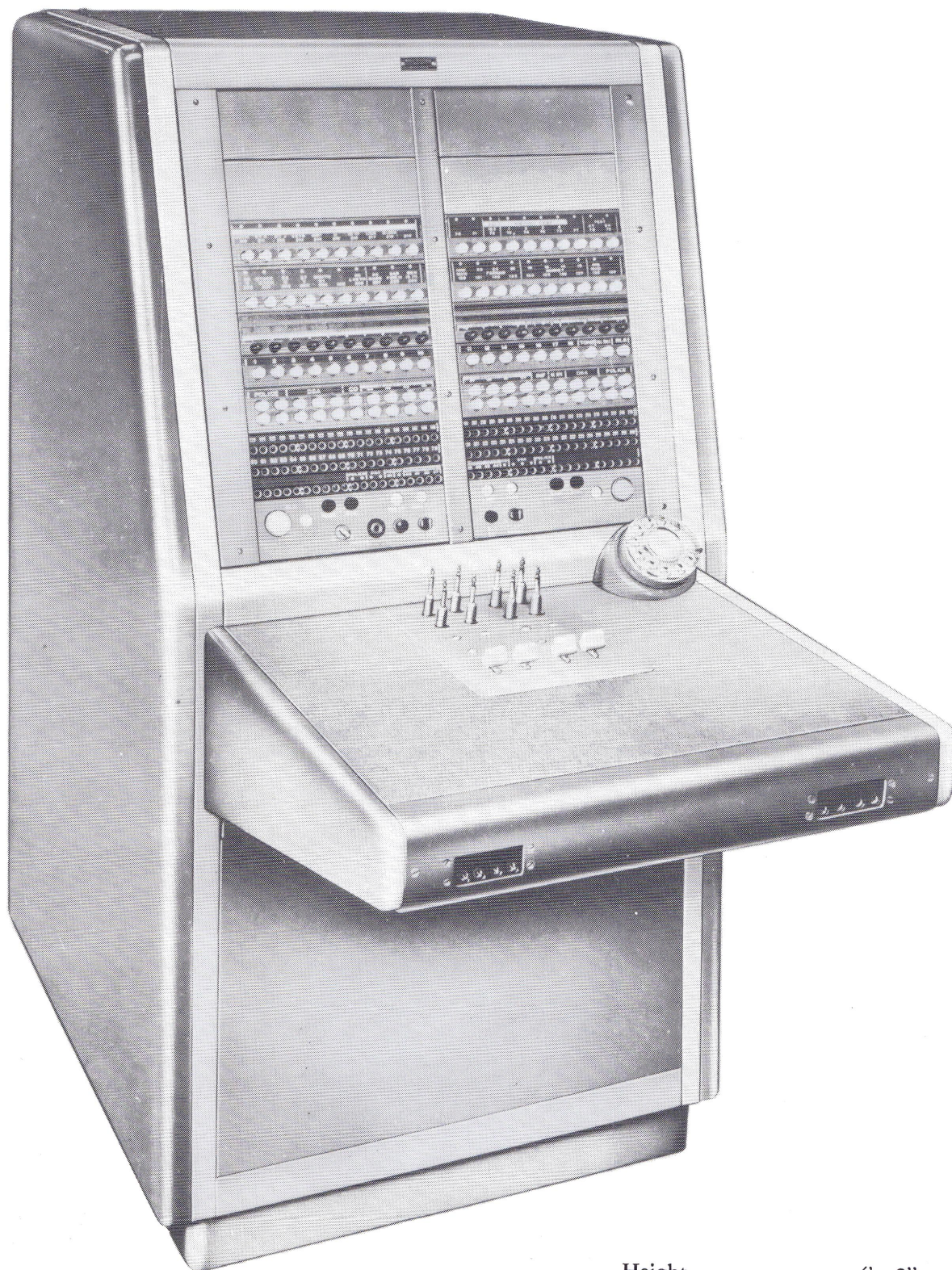
The switchboard may be arranged for *operation by two attendants* by operating the position grouping key. (POS. GRP.) This key is a three-position turn-type key. In its normal vertical position, the switchboard is arranged for operation by two attendants. Under this condition the left section line keys and the jacks for the right section line (which appear in the left panel of the center section) can be connected to the attendant's telephone circuit on the left side of the switchboard. Conversely, the line keys in the right section and jacks for the left section line keys (which appear in the right panel of the center section) can be connected to the attendant telephone circuit on the right side of the switchboard. Four of the eight cord circuits are associated with each attendant's telephone circuit.

When arranged for *operation by one attendant* the grouping key may be operated so that the attendant may use either the right or left attendant's telephone set jacks and associated common controls. When the grouping key is operated to the left position (L) the common controls (release key, recorder cutout key and ringing key) and dial on the left side of the switchboard and all eight of the cord circuits are associated with the left attendant's telephone jacks. Operation of the grouping key to the right position (R) associates these circuits with the right attendant's telephone jacks.

Where paging is provided the attendant selects the paging line or lines by depressing the associated buttons. Depressing a tone button places tone on the line (s) selected and the tone is received amplified and reproduced over the remote paging system. After an interval the tone button is released and the necessary information is passed over the system. Depressing the all call button connects all lines simultaneously. A paging jack is provided whereby the attendant can patch with a cord circuit a remote station into the paging system. Selection of the line connected to the paging system under this condition is made by the switchboard attendant.

Arrangements are provided to connect *voice recording equipment* to each of the attendant's telephone circuits to record all calls received at the switchboard. A recorder connector is used to couple the recording equipment to the attendant's telephone circuit. The attendant may exclude the recording of calls not of an emergency nature by holding a non-locking recorder cutout key operated during the conversation.

520B SWITCHBOARD
Capacity 100 Lines



Height	4' 2"
Depth inclu. key shelf	3' 21 $\frac{1}{4}$ "
Depth exclu. key shelf	1' 10"
Width	1' 11 $\frac{1}{2}$ "

570-TYPE OUTDOOR TELEPHONE



16 $\frac{7}{8}$ " high
12" wide
7" deep

