

B-12-12-42

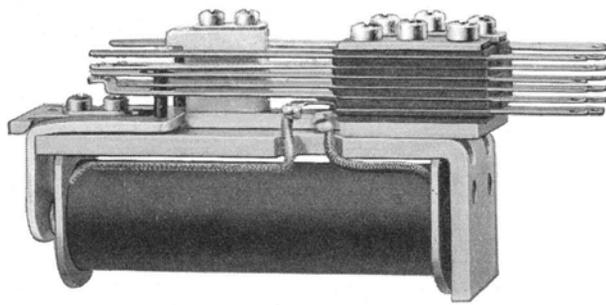
## RELAYDIAL Switchboards

Stromberg-Carlson RELAYDIAL Switchboards serve the field of telephone exchange requirements in which dial operated equipment lends itself particularly well in providing switching facilities for:

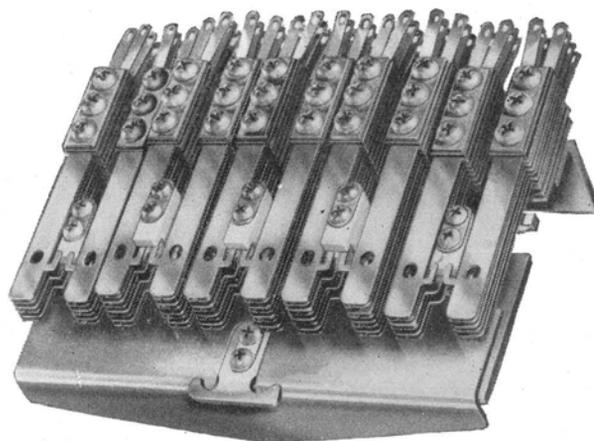
- City and Town Central Offices
- Private Branch Exchanges
- Isolated Community Exchanges
- Inter-Connected Community Exchanges
- Satellites for Larger Exchanges

Stromberg-Carlson offers dial operated equipment unsurpassed in design, reliable in operation and economical in maintenance.

The relay, as a switching device, is well-known to every telephone maintenance man and engineer. Even the dial systems which employ complicated electro-mechanical line, connector and selector devices, make use of the relay to a large degree. This being true, Stromberg-Carlson adopted the relay as its switching unit in all RELAYDIAL Switchboards. The No. 500 Type relay now used, was designed to fulfill the exacting requirements of RELAYDIAL service. Stromberg-Carlson Engineers have succeeded in practically eliminating marginal operating conditions and simplifying the means of securing the best in the salient features. A further step towards producing an outstanding system was accomplished by the introduction of modern housing and arrangement of relay apparatus, power, ringing and test equipment, and simplified wiring.



\*No. 500 Relay especially designed for RELAYDIAL operation



\*No. 700 Multi-Contact Relay

Briefly summarized the complete system has the following essentials which are of major interest to the purchaser:

**Reliability of Operation**, provided by employing the best known design and construction of relays.

First: The relays have few mechanical parts comprising:

- (a) One-piece frame and core.
- (b) One-piece angle type armature.
- (c) Self-contained type coil.
- (d) Unit contact spring assembly.

Second: Minimum of moving parts consisting only of:

- (a) Armature.
- (b) Armature actuated twin contact springs, provide reliable operation. Back and front contact springs are fixed and have no movement.

**Completeness of Service**, assured by selecting the tried and worth-while features in circuit arrangement which a subscriber must have to fit the local requirements.

Circuit design has:

- (a) Eliminated marginal local relay operation.
- (b) Assured maximum operating security by rotation of connector link use.
- (c) Guarded against preliminary impulse errors when subscriber fumbles handset in removing it from cradle.
- (d) Provided emergency switching to standby apparatus in case of power failure or interruption.
- (e) Arranged for "tell-tale" indications to distant controlling office when power failure occurs or when fuses blow.
- (f) Positive lockout feature preventing double connection due to simultaneous calls.

**Easy Installation and Maintenance** made possible by correct layouts and circuit terminations.

Construction design provides:

- (a) Rigid support, by welding relay mountings to steel frame work.
- (b) Easy installation of future equipment, by correct layout of apparatus and terminals.
- (c) Ready inspection of contacts by mounting relays with springs on edge.
- (d) Ready checking of complete individual relay spring assemblies by use of long skimmers and removal of two screws.
- (e) Permanent adjustment of relays at factory, requiring minimum adjustment while installing and practically no adjustment after installation.

Trunking facilities may be arranged for RELAYDIAL Systems connected with dial, central energy and magneto central offices.

\*For detailed relay information see "Coded Parts" Section of catalogues under Relays.

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## RELAYDIAL Switchboards (Cont.)

### Circuit Divisions

#### Circuit Features and Description

A typical RELAYDIAL System circuit set-up is comprised of the following briefly described equipment divisions and operating features.

**LINE CIRCUITS**—Each line circuit contains a line relay, a cut-off relay and lock-out relay.

**LINE FINDERS**—Selection of the calling line by the line finder is automatic and practically instantaneous, accomplished entirely by relay operation. The line finders are pre-selected ahead of the calls and are allotted by a common relay allotter in rotation, so that line finders are used in rotation irrespective of the disconnection of previous calls.

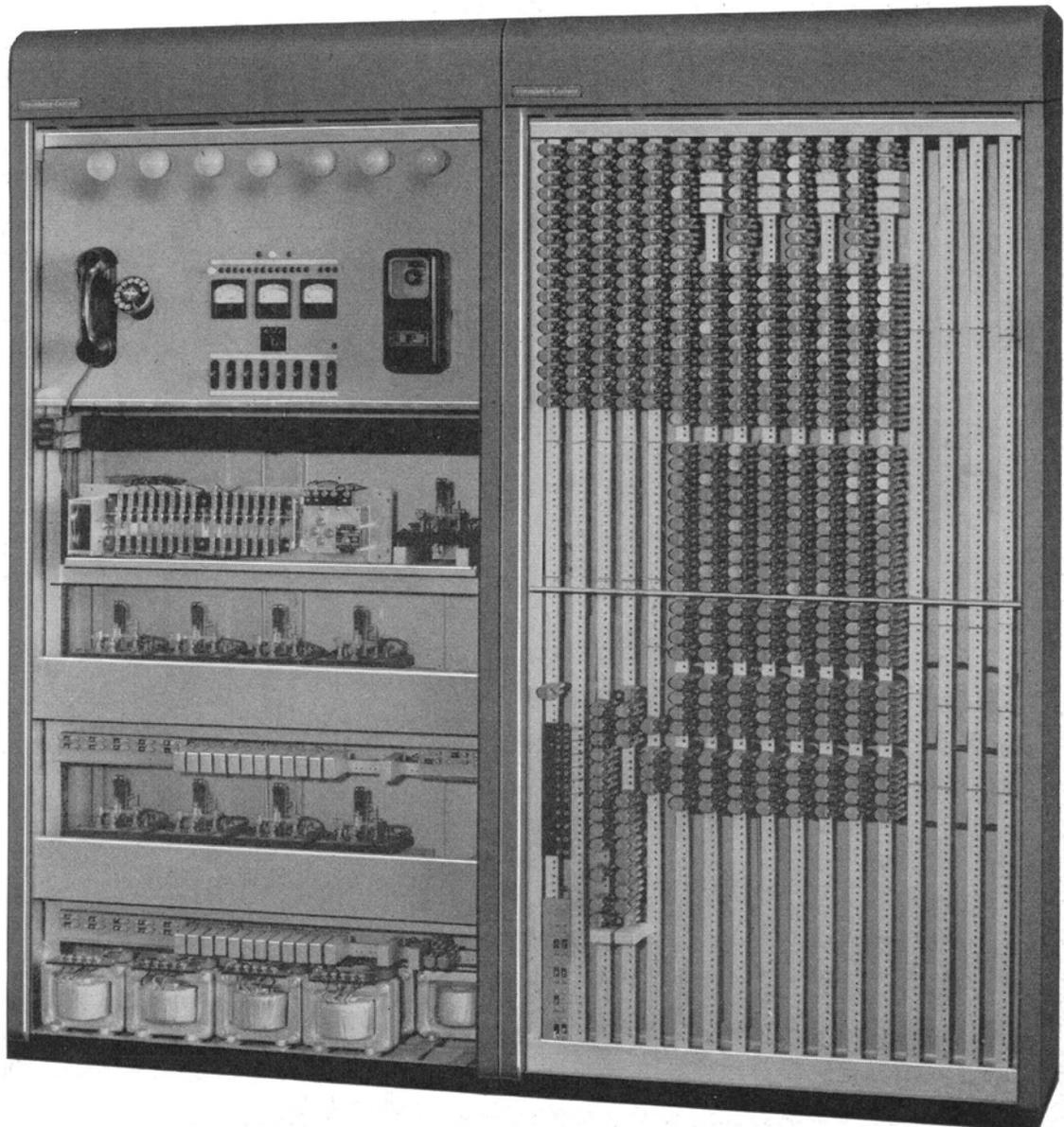
A common group of tens and units marking relays are furnished to mark the calling line to be found by the pre-selected line finder and these marking relays also serve the purpose of guard relays to prevent double connections. All line finders are accessible to all lines of the system of 200 lines or less type.

Each line finder is permanently associated with a connector link and a line connector.

**CONNECTOR LINKS**—The function of the connector link is to respond to the dial impulses transmitted from the station to which the line finder connects, for registering the wanted station by counting the impulses transmitted.

All the necessary functions of impulsing, counting, registering, transferring, testing, ringing, and busy signaling are automatically performed by relays of the connector link.

**LINE CONNECTORS**—The function of the line connector is to establish connection with the called line by the operation of two relays, a tens connector relay and a units connector relay.



Front of typical RELAYDIAL Switchboard with lift-out hinged doors removed

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## RELAYDIAL Switchboards (Cont.)

**SELECTORS**—In exchanges of more than 200 lines, selectors of the relay type are interposed between the line finders and the connector links, with the line connectors remaining associated with the connector links. The selectors serve to distribute the calls from lines picked up by the line finders of one group of 100 lines to the connector links and connectors of the desired 100 line group. This group selection is performed by relay type selectors. In the 200 point system, capacities up to 200 lines have the line finders and line connectors arranged to select up to 200 lines, with a simple relay selection made in the line connector unit for selecting the first or second 100 line group as determined by the number dialed.

The system operation is designed to operate with telephones equipped with standard 10 impulse dials.

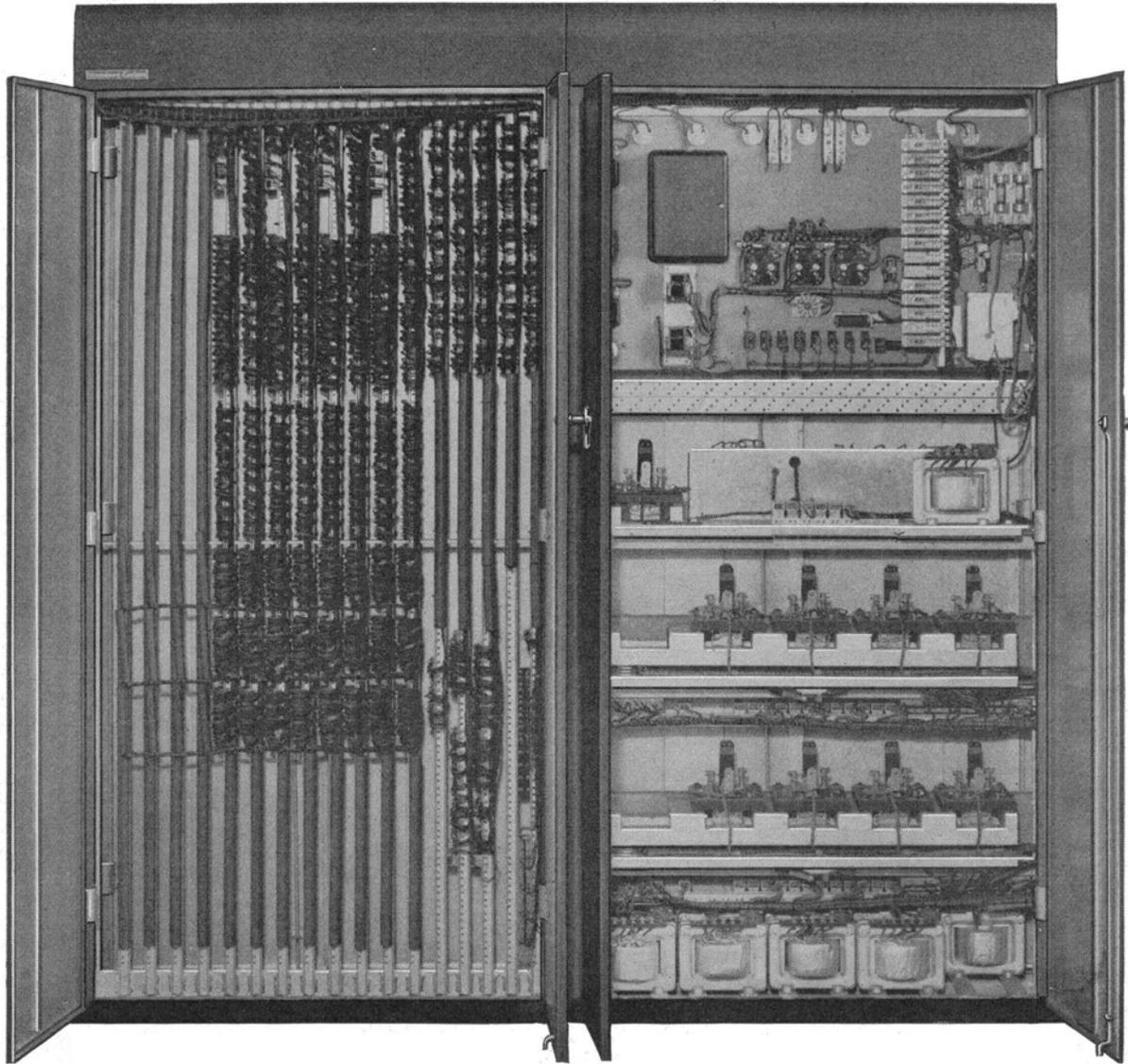
**DIALING**—Metallic subscriber lines and trunk lines are equipped for loop dialing. Single wire lines have ground return dialing.

**LOCAL CALLS**—All local calls are made by removing the receiver and dialing the directory number of the desired party. If the line is idle, it will be rung automatically and inter-

mittently until answered, until abandoned by the calling party, or until the time disconnect feature automatically releases the connection.

In all systems, except where code ringing is provided, the ringing current will be tripped when the called party's receiver is removed, either during the silent or ringing interval. In the code ringing system, a complete code is sent out over the called line, irrespective of whether the calling party abandons a call in the middle of a code or the called party answers during the transmission of a code. This type of code ringing is standard, but instantaneous tripping of the ringing is optional, if desired.

**REVERTING CALLS**—Calls to stations on the same line are made by dialing the regular directory number of the desired station. The regular busy tone will be heard when the dialing is completed as a signal for the calling party to hang up the receiver and to allow sufficient time for the called station to be rung. After a reasonable interval of time, the calling party removes the receiver and conversation then takes place between the two parties on the same line. Either party removing the receiver trips the ringing current.



Rear of typical RELAYDIAL Switchboard with lift-out hinged doors swung open  
Dimensions: Length (double cabinet)—6'8  $\frac{1}{16}$ " , Height overall—6'9  $\frac{1}{16}$ " Depth—13  $\frac{3}{8}$ "

## RELAYDIAL Switchboards (Cont.)

**LINE LOCKOUT**—The line lockout feature is provided and gives the following advantages for offices of the unattended dial type:

1. Automatic lockout of lines which develop short circuits or low resistance shunts.
2. Automatic lockout of lines with the receiver off the hook.
3. Automatic release of connections and lockout of lines which establish a connection and then fail to release after a predetermined interval.
4. Automatic release of reverting call connections established, both when the called or calling party removes the receiver or when the reverting call is not answered after a predetermined interval.
5. Automatic restoration of all locked out lines to normal service condition immediately upon removal of the cause of the lockout.

### UNLIMITED REVERTING CALL CONVERSATIONS

Since the line finder, the connector link and the line connector (also the selector in larger systems) are all automatically released after the ringing interval, simultaneous conversations may be carried on on all party lines irrespective of the number of links in the system. This feature renders a link available for another call as soon as the automatic release and lockout functions are performed on a reverting call using this same link.

**TIME DISCONNECT**—The time disconnect feature may be provided in certain localities for use in limiting the conversation time. This feature applies a warning tone to the connection a predetermined time prior to automatic disconnection. If the connection is not released after this tone is heard, it will be automatically released within one minute, with a second warning tone applied just prior to disconnection. These time intervals may be varied to suit local conditions.

**PRELIMINARY IMPULSE RELEASE**—This system is provided with a preliminary impulse absorbing feature, whereby a single impulse transmitted when the receiver is removed, will not result in a wrong number. Such a preliminary impulse is frequently caused by fumbling the handset when removing it from the stand, which would ordinarily prefix the digit one to the wanted number, thus resulting in a wrong number.

**RINGING EQUIPMENT**—When code ringing or harmonic ringing is employed, the pole changer or ringing generator is not continuously operated, but is started when a connection is in condition requiring ringing current.

Furthermore, the dial tone and busy tone common apparatus is only operated when a connection is in condition requiring these tones.

**CODE RINGING**—For code ringing, a code interrupter of the relay type is furnished. The code interrupter is arranged with "pick-up" and "hold" circuits, to prevent application of ringing current to the called line except at the beginning of the code cycle and to maintain ringing current on the called line until the end of the ringing cycle respectively.

The code interrupter furnished is arranged for 20 different codes as specified. The code interrupter is also arranged to apply one extra long ring to the called line in exchanges where a general call signal is provided.

The ringing systems served by the code ringing arrangement may be single party with bridged ringers, two-party selective with one station wired from each side of the line to ground, and 20 party for single wire grounded lines or metallic ringing.

**FREQUENCY RINGING**—The equipment is arranged to furnish frequency ringing for 10 party selective service on metallic lines, five parties from each side to ground; also, five party selective service metallic ringing or on grounded lines.

A combination code and harmonic ringing system may be supplied.

**TELEPHONES**—Any standard make of central energy telephone with dial is suitable for use in this system. Magneto (local battery) telephones may also be used in this system when a simple wiring change is made for making the telephone circuit local battery talking and common battery dialing. This change also means the addition of a dial and a condenser in the ringer circuit. The hand generator is removed.

**BUSY TONE**—Busy tone is provided to notify the calling subscriber of busy line, link and trunk conditions. The common busy tone equipment is of the relay type for systems up to 200 line capacity.

**DIAL TONE**—Dial tone is provided to give the calling subscriber a steady tone when the line finder has associated a dialing link with the calling line, so that dialing may proceed. Dial tone will not be heard when the calling line is ordinarily in use or when no links are available. The common dial tone equipment is of the relay type for systems up to 200 line capacity.

**TOLL TRUNKS**—The circuits in this system are provided for toll trunk operation. Toll trunks may be of the ring-down type for magneto exchanges or of the common battery type for common battery exchanges. Phantom trunk groups may be arranged for A.C. dialing.

**P.B.X. TRUNKS**—In P.B.X.'s having more than one trunk, only one directory number is assigned. When trunk number is dialled the circuits are arranged to select the first idle trunk in the group.

**TRUNK SUPERVISION**—Supervision on calls from the dial exchange to the distant magneto office is provided by means of ringing current operating the disconnect signals. Signaling the distant office is by means of ringing current operating the line drop.

Common battery supervision is provided by the usual loop operation; that is, regular common battery supervision is provided over the trunk by opening the direct current circuit.

Supervision from a common battery manual office to the dial office is provided by a reversal of the battery fed to the trunk when the called party answers.

Switch hook supervision from the dial office to the manual exchange is arranged so that the distant operator may be signaled by flashing the lamp in response to a rapid operation of the switch hook.

**PAY STATIONS**—Arrangement is made for pay stations of the coin box type with free service for calls to official lines or trunk calls. A pay station tone is connected by way of each line circuit to a toll connection which gives a momentary tone to the toll operator that a pay station is calling.

**ALARMS**—This feature provides for the transmission of a signal to the distant manual office when an alarm condition exists in the remote unattended dial exchange. This transmission is over one of the regular toll trunks and is only effective when this trunk is not in use for a call.

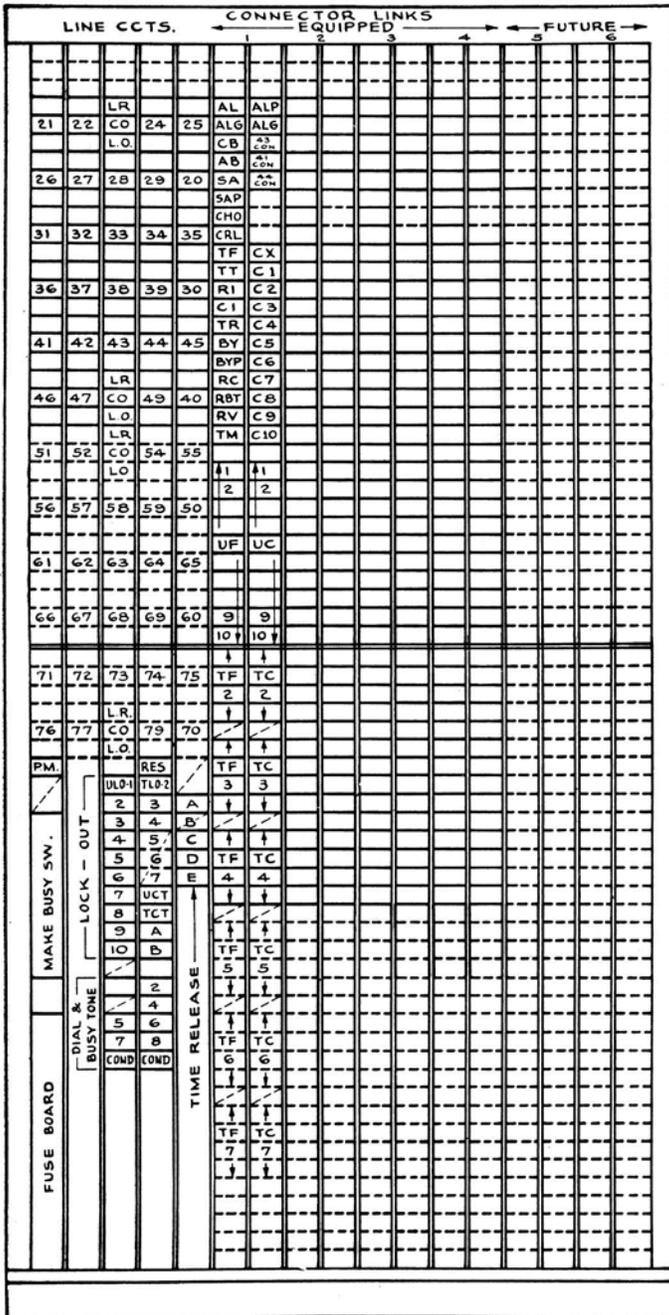
For checking the alarm, the distant toll operator dials a special number and, by means of tones, or the absence of tones, determines what type of alarm condition exists in the remote dial office.

**CLASSES OF SUBSCRIBERS' LINES**—Equipment can be arranged to serve the following different types of lines:

- (a) Individual.
- (b) Two party divided circuit.
- (c) Private Branch Exchange.
- (d) Four or eight party, full selective.
- (e) Five or ten party, full selective.
- (f) Ten and twenty party code ringing.
- (g) Post pay coin box line.

This flexibility enables suitable service to be rendered to any telephone community.

RELAYDIAL Switchboards (Cont.)



Block diagram of typical RELAYDIAL Switchboard

Equipment and Layout Table of Typical RELAYDIAL Switchboard

Space for	Equipped	Description
60	30	Lines
6	4	Connector Links and Allotters
1	1	Lock-out Equipment
1	1	Dial and Busy Tone
1	1	Permanent Signal Time Release
1	1	Permanent Alarm
1	1	Peg Counter

While the above table indicates the typical layout shown in the illustrations, the design permits the installation of widely different systems to fill the requirements of any telephone locality.

Relay Symbols

To simplify circuit relay designations the following table of symbols is used. They are not only applied to the circuit wiring plans, but to the engineering layouts, as indicated on the adjacent line drawing.

Line Circuit

- LR—Line
- CO—Cut-off
- LO—Lock-out

Allotter Circuit

- AL—Allotter
- ALG—Allotter Group
- ALP—Allotter Repeater

Connector Links

- AB—Answering Bridge
- BY—Busy
- BYP—Busy Repeater
- C-1/C-10—Counters
- CB—Calling Bridge
- CHO—Change Over
- CI—Cut In
- CRL—Counter Release
- CX—Impulse Repeater
- RBT—Reverting Busy Test
- RC—Reverting Call
- RI—Ringing
- RV—Reverse Ring
- SA—Slow Acting
- SAP—Slow Acting Rept.
- TF—Transfer
- TM—Timing
- TP—Trip
- TT—Test

Commons

- A/B—Common Timer
- PC—Peg Count
- PM—Permanent Alarm

Connector

- UC-1/UC-10—Units Conn.
- TC-2/TC-4—Tens Conn.

Finder

- UF-1/UF-10—Units Finder
- TF-2/TF-4—Tens Finder

Marking

- TLO-2/TLO-4—Tens Lockout
- ULO-1/ULO-10—Units Lockout

Continuity Alarm Test

- UCT—Units Test
- TCC—Tens Test

**SPECIAL CIRCUITS**—In the preparation of suitable equipment for a given location or service, it may be necessary to provide special circuit designs for the proper handling of such requirements. The Stromberg-Carlson Company will be glad to co-operate in the solution of such problems.

Assembly

**RELAYDIAL** switchboards are assembled in units completely wired and tested in the factory. The only installation work necessary for the installer to perform is to run and connect the tie cables between units and the cables which connect to the main distributing frame from the terminals

at the top of the steel cabinets. Also to install and connect the storage batteries and charging equipment. By this arrangement the cost of the initial installation is kept to a minimum.

Estimates and Layouts

Equipment layouts and office plans necessary to secure the most efficient and economical arrangements will be made upon request. Detailed estimates can readily be figured when the preliminary work of determining the needs have been decided upon.

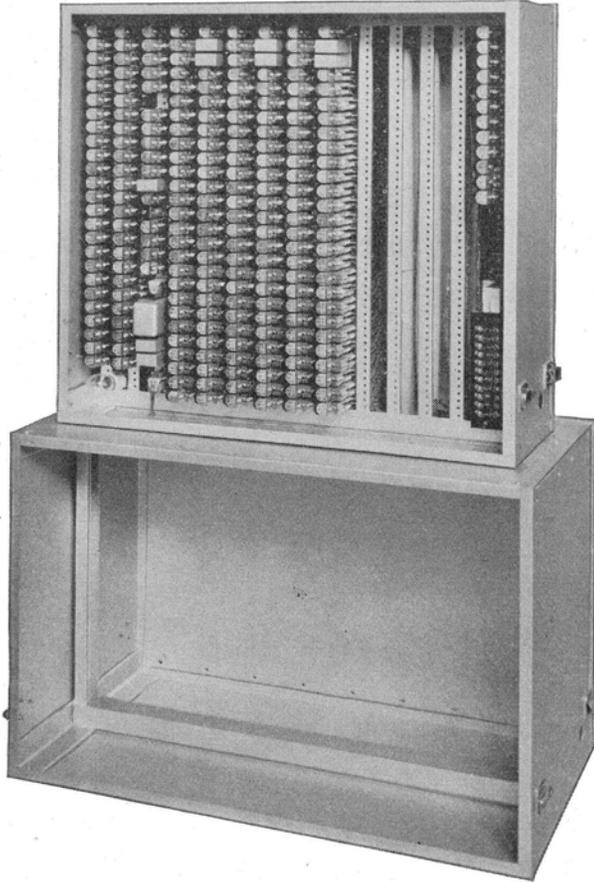
Stromberg-Carlson engineers invite your earnest consideration of their modern RELAYDIAL systems.

## RELAYDIAL Switchboards (Cont.)

### 5-25 RELAYDIAL P.X. Switchboard

The 5-25 RELAYDIAL Switchboard is a private exchange wired for 25 lines and 5 connecting links. It provides for an ultimate of five simultaneous dial telephone conversations.

Local intercommunication only is rendered by the No. 5-25 System. Talking connections are featured by secret service, continuous night and day service, and executive right of way. One pair of wires only is necessary to connect each telephone to the system.



Open View of No. 5-25 System mounted on B-14955 Type Base

Code call and conference circuit features can be furnished. When the code call feature is provided the equipment is mounted in a separate wall type cabinet which is easily connected to the system.

**CABINETS**—The relay equipment for the No. 5-25 System is housed in a plain sheet steel cabinet with removable front and back panels. A light durable finish is provided. Dimensions are: height  $30\frac{1}{4}$ " , depth  $12\frac{1}{8}$ " , width  $32\frac{1}{8}$ " .

The base cabinet is similarly constructed. Besides providing a suitable base for the relay cabinet, it also provides space for installing the battery and charging equipment. Dimensions are: height  $24\frac{3}{8}$ " , depth  $20\frac{1}{4}$ " , width  $36\frac{1}{4}$ " . Although recommended, the use of this cabinet is optional.

### Circuit Description

**LINE FINDERS**—Selection of the calling line by the line finder is automatic and practically instantaneous, accomplished entirely by relay operation. The line finders are preselected ahead of the calls and are allotted by a common relay allotter in rotation, so that line finders are used in rotation irrespective of the disconnection of previous calls.

### Circuit Description (Cont.)

A common group of tens and marking relays are furnished to mark the calling line to be found by the preselected line finder. These relays also serve the purpose of guard relays to prevent double connections. All line finders are accessible to all lines. Each line finder is permanently associated with a connector link and a line connector.

**CONNECTOR LINKS**—The function of the connector link is to respond to the dial impulses transmitted from the station to which the line finder connects, for registering the wanted station by counting the impulses transmitted.

All the necessary functions of impulsing, counting, registering, transferring, testing, ringing, and busy signaling are automatically performed by relays of the connector link.

**LINE CONNECTORS**—The function of the line connector is to establish connection with the called line by the operation of two relays, a tens connector relay and a units connector relay.

**BUSY and DIAL TONES** are provided by an electronic vacuum tube type tone generator. An interrupted busy tone notifies the calling party when a line is busy. A steady dial tone is given the calling party when the line finder has associated a dialing link with the calling line. Dialing may then proceed.

**TELEPHONES**—Any standard central energy telephone equipped with a standard 10 impulse dial is suitable for use on the No. 5-25 System. The telephones are numbered with two digit numbers.

**EXECUTIVE RIGHT OF WAY**—This feature allows an executive right of way when he desires to interrupt a conversation, to give an order, or to obtain information.

### Power and Ringing Equipment

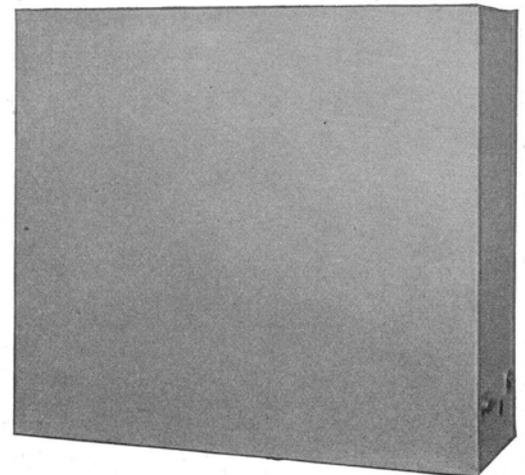
The No. 5-25 System is designed to operate from a 24 volt Battery Eliminator with a Stand-by Storage Battery which cuts in automatically in case of power failure.

A typical outfit for this purpose consists of:

- 1 Cat. 1043ER,  $1\frac{1}{2}$  Ampere Raytheon Rectifier.
- 1 Cat. 21296, BTMH-2, 12 cell Storage Battery.

The Rectifier provides power for the No. 5-25 P.X. and floats the storage battery, thus keeping the battery fully charged at all times for emergencies.

A vibrating type ringing converter is furnished with each No. 5-25 System. Facilities are also provided for central office ringing current supply or the use of a Sub-Cycle Converter. When so used, the local ringing vibrator can then be used for emergencies. An automatic switch-over relay operates when there is a failure in the outside source of ringing current supply.



Closed View of No. 5-25 Cabinet

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## RELAYDIAL Switchboards (Cont.)

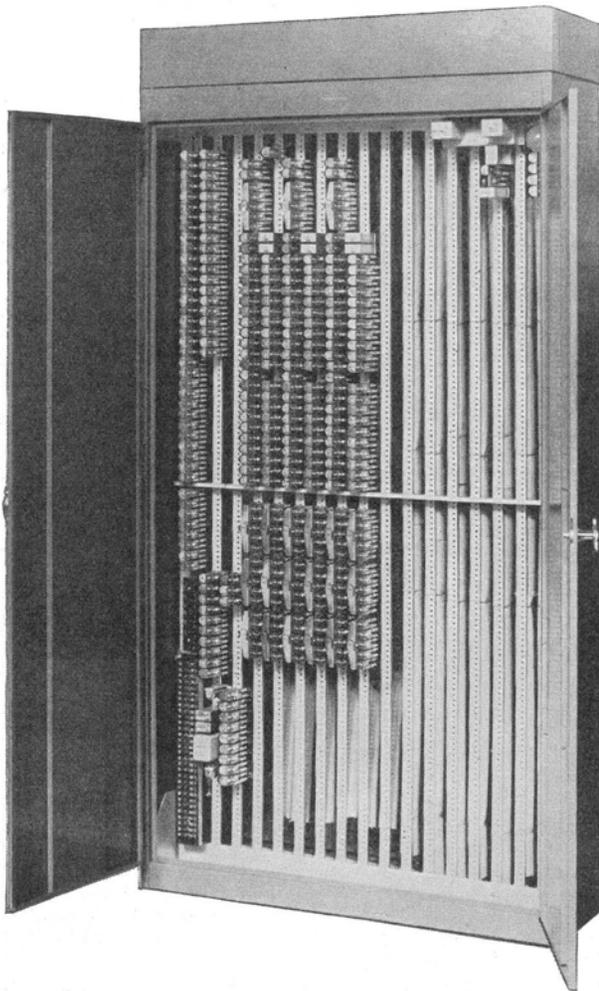
### 7-60 and 10-100 RELAYDIAL P.X. Switchboards

The 7-60 RELAYDIAL Switchboard is a private exchange wired for 60 lines and 7 connecting links. It provides for an ultimate of seven simultaneous dial telephone conversations.

The 10-100 RELAYDIAL Switchboard is similar to the 7-60 Switchboard except in size. It is wired for 100 lines and 10 connecting links and requires **two** cabinets having the dimensions shown in the cabinet description.

Local intercommunication only is rendered by these Systems. Talking connections are featured by secret service, continuous night and day service, and executive right of way. Only one pair of wires is necessary to connect each telephone to the system.

Code call and conference circuit features can be furnished. When the code call feature is provided the equipment is mounted in a separate wall type cabinet which is easily connected to either system.



Open view of No. 7-60 RELAYDIAL P.X. Switchboard

**CABINET**—The relay equipment for the No. 7-60 and No. 10-100 Systems is mounted in steel cabinets with hinged removable doors and removable domes. The framework is built of structural steel, constructed and braced to be strong and rigid. The exterior of the steel cabinet is finished in an attractive beige colored "Duco." Dimensions of a single cabinet are: height 6'9½", width 3'4", depth 1'1¾". Two of these cabinets are required for the 10-100 system; one for the No. 7-60.

### Circuit Description

**LINE FINDERS**—Selection of the calling line by the line finder is automatic and practically instantaneous, accomplished entirely by relay operation. The line finders are preselected ahead of the calls and are allotted by a common relay allotter in rotation, so that line finders are used in rotation irrespective of the disconnection of previous calls.

A common group of tens and units marking relays are furnished to mark the calling line to be found by the preselected line finder. These relays also serve the purpose of guard relays to prevent double connections. All line finders are accessible to all lines. Each line finder is permanently associated with a connector link and a line connector.

**CONNECTOR LINKS**—The function of the connector link is to respond to the dial impulses transmitted from the station to which the line finder connects, for registering the wanted station by counting the impulses transmitted.

All the necessary functions of impulsing, counting, registering, transferring, testing, ringing, and busy signaling are automatically performed by relays of the connector link.

**LINE CONNECTORS**—The function of the line connector is to establish connection with the called line by the operation of two relays, a tens connector relay and a units connector relay.

**BUSY and DIAL TONES** are provided by an electronic vacuum tube type tone generator. An interrupted busy tone notifies the calling party when a line is busy. A steady dial tone is given the calling party when the line finder has associated a dialing link with the calling line. Dialing may then proceed.

**TELEPHONES**—Any standard central energy telephone equipped with a standard 10 impulse dial is suitable for use with these systems. The telephones are numbered with two digit numbers.

**EXECUTIVE RIGHT OF WAY**—This feature allows an executive right of way when he desires to interrupt a conversation, to give an order, or to obtain information.

### Power and Ringing Equipment

The No. 7-60 and No. 10-100 Systems operate from 24 Volt, 12 Cell Storage Batteries. Any quietly operating charging equipment of suitable output may be provided. A typical outfit consists of:

- 4 Units of 3-LXGH-7 Exide Batteries (12 cells)
- 1 No. 1066, 1 ampere Raytheon Recticharger.

A Sub-Cycle Ringing Converter for regular signalling and a vibrating converter for emergencies is furnished with each No. 7-60 or No. 10-100 System. An automatic switch-over relay operates when there is a failure in the outside source of ringing current supply.

Quick, reliable, and clear telephone service are recognized features of all Stromberg-Carlson RELAYDIAL P.X.'s.

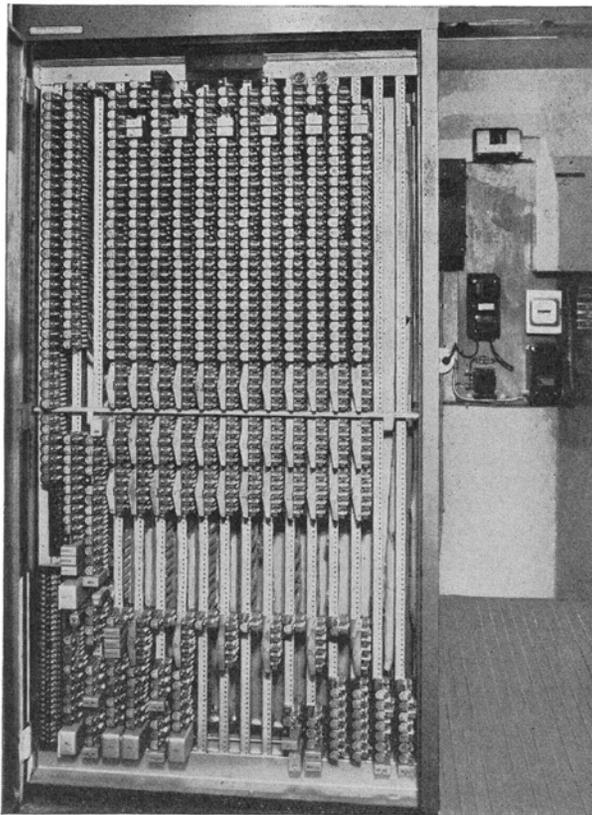
## RELAYDIAL Switchboards (Cont.)

### 7-50 and 10-90 RELAYDIAL P.B.X. Switchboards Trunk Connected

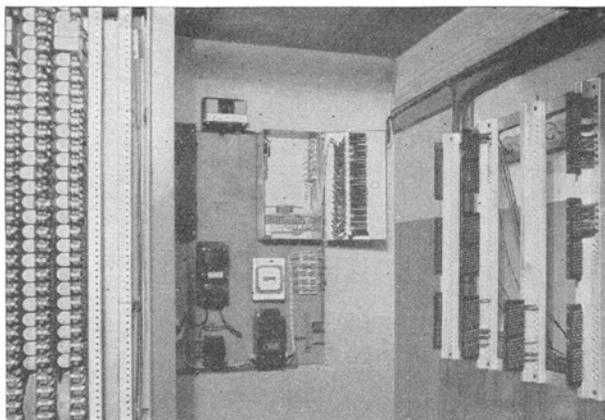
The No. 7-50 RELAYDIAL Switchboard is a private branch exchange used with an attendant's cabinet, wired for an ultimate of 50 lines, 7 connecting links, 7 combination central office trunks, 2 information trunks and 1 intercepting line.

The No. 10-90 P.B.X. is a similar board except in size. It is wired for an ultimate of 90 lines, 10 connecting links, 10 combination central office trunks, 5 information trunks and 1 intercepting line.

Both central office and local intercommunication service is provided by these systems. Talking connections are featured by secret service, continuous night and day service and executive right of way. Only one pair of wires is necessary to connect each telephone to the system.



No. 7-50 P.B.X. Installation



RELAYDIAL P.B.X. Installation showing convenient connecting terminals, Code Call Equipment, Tone Generator, Sub-Cycle Ringing Converter, etc., mounted on wall.

### Cabinet

**CABINET**—The relay equipment for the No. 7-50 and No. 10-90 Systems is mounted in steel cabinets with hinged removable doors and removable domes. The framework is built of structural steel, constructed and braced to be strong and rigid. The exterior of the cabinet is finished in an attractive biege colored duco. Dimensions are: height 6' 9½", width 3' 4", depth 1' 1¼". Two of these cabinets are required for the No. 10-90 System; one for the No. 7-50.

Code Call and Conference Circuit features can be furnished with these systems. When the code call service is provided, the equipment is mounted in a separate cabinet which is easily connected to the system.

### Circuit Description

**LINE FINDERS**—Selection of the calling line by the line finder is automatic and practically instantaneous, accomplished entirely by relay operation. The line finders are preselected ahead of the calls and are allotted by a common relay allotter in rotation, so that line finders are used in rotation irrespective of the disconnection of previous calls.

A common group of tens and units marking relays are furnished to mark the calling line to be found by the preselected line finder. These relays also serve the purpose of guard relays to prevent double connections. All line finders are accessible to all lines. Each line finder is permanently associated with a connector link and a line connector.

**CONNECTOR LINKS**—The function of the connector link is to respond to the dial impulses transmitted from the station to which the line finder connects, for registering the wanted station by counting the impulses transmitted.

All the necessary functions of impulsing, counting, registering, transferring, testing, ringing, and busy signaling are automatically performed by relays of the connector link.

**LINE CONNECTORS**—The function of the line connector is to establish connections with the called line by the operation of two relays, a tens connector relay and a units connector relay.

**COMBINATION TRUNKS TO PUBLIC EXCHANGE**—Full metallic trunk arranged so that RELAYDIAL Stations may dial out directly by dialing the single digit "9." Incoming calls are intercepted and distributed by the attendant. The attendant operator also has access to outgoing central office trunks. Combination trunks may be arranged for restricted outgoing call service from any RELAYDIAL station. Combination trunks are arranged for night connections in the attendants cabinet.

**TWO-WAY CENTRAL OFFICE TRUNKS**—The Attendant's Cabinet is wired for 10 two-way Central Office Trunks, equipped as specified. When more than 10 Central Office Trunks are required an ultimate of 20 may be provided by equipping the two-way trunks in the Attendant's Cabinet to be used as preferred incoming trunks. The two-way trunks can also be used by the Attendant as outgoing trunks. If a RELAYDIAL Station finds all trunks busy, it may dial the Attendant over the Information Trunk. The Attendant can complete the call over an available two-way trunk.

**INFORMATION TRUNKS**—These trunks terminate before the attendant operator. Any RELAYDIAL Station may reach the attendant operator by dialing the single digit "0," thus providing a means to receive special information or instructions.

**INTERCEPTING OR DEAD NUMBER TRUNK**—Arranged for cross connecting to any RELAYDIAL line for discontinued stations.

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## RELAYDIAL Switchboards (Cont.)

### 7-50 and 10-90 RELAYDIAL Circuits (Cont.)

**CONFERENCE CHANNEL**—Provides for connecting a group of individual stations on a common line. The individuals who are to take part in the conference, are notified by means of their regular telephone service. At the appointed time, the individuals who are to take part, dial the conference number. Two or more persons may begin a conference and any number of persons can cut in, up to the number of equipped links in the system. A regular line number is assigned for the channel number.

Other types of conference service can be provided when requirements demand.

**WATCHMAN'S NIGHT SERVICE**—Consists of a jack arrangement in the Attendant's Cabinet so that an incoming Central Office Call may be patched into the Code Call System, allowing the watchman to answer from any station telephone after working hours. This service is furnished only with Code Call equipment.

**EXECUTIVE RIGHT OF WAY**—Permits interrupting a conversation to give an order or to get vital information.

**ALARMS**—Circuits are protected by alarm type fuses. A permanent condition of any link circuit is indicated to the attendant operator by means of an indicating lamp.

**BUSY and DIAL TONES** are provided by an electronic vacuum tube type tone generator. An interrupted busy tone notifies the calling party when a line is busy. A steady dial tone is given the calling party when the line finder has associated a dialing link with the calling line. Dialing may then proceed.

**TELEPHONES**—Any standard central energy telephone equipped with a standard 10 impulse dial is suitable for use on Relaydial P.B.X. System. The telephones are numbered with two digit numbers.

### Attendant's Cabinet

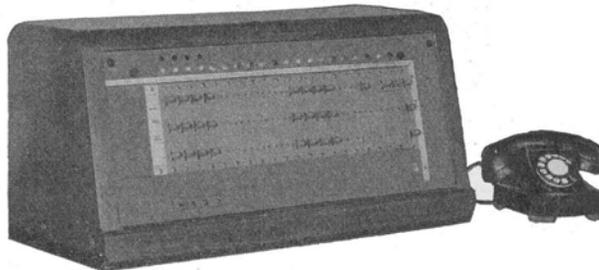


Floor Type Attendant's Cabinet

A floor type Attendant's Cabinet is usually selected for the No. 7-50 or No. 10-90 RELAYDIAL P.B.X. This permits the installation of a complete multiple of all the lines and central office trunks to be made in the face of the switchboard. Other miscellaneous circuits may be conveniently grouped before the operator. See preceding circuit descriptions.

However, when trunk traffic is light, a Turret type attendant's cabinet is available for handling intercepting services only.

### Attendant's Cabinet (Cont.)



Turret Type Attendant's Cabinet

### Power and Ringing Equipment

The No. 7-50 and No. 10-90 Systems both operate off 48 volt 24 cell batteries. A typical power layout consists of the following:

- 8 units of 3LXGH-7 Storage Cells or
- 8 units of 3LXGH-9 Storage Cells
- 1 Raytheon Recticharger of from one to three ampere capacity.

Battery and charger size depend upon the number of links equipped.

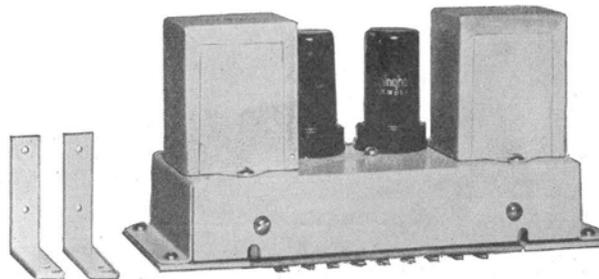
A Sub-Cycle Ringing Converter for regular signalling and a vibrating converter for emergencies is furnished with each No. 7-50 or No. 10-90 System.

An automatic switch-over relay operates when there is a failure in the outside source of ringing current supply.

### Wall Type Connecting Rack

A wall mounting connecting rack is provided with each installation of the RELAYDIAL P.B.X.'s. This provides a convenient method for adding or changing station line cross connections without removing the dome from the relay cabinet or disturbing the attendant operator.

### Tone Generators



No. 224 Tone Generator with two P-34390 Mounting Brackets

Tone generators, of the Tube oscillator type, generate signalling tones and are used principally for Busy and Dial tones in RELAYDIAL telephone systems. The No. 224 and No. 248 Type Generators provide these tones at approximate frequencies of 375 cps. and voltages of approximately .05.

The generator has dimensions as follows: length  $7\frac{1}{8}$ "", width  $3\frac{1}{4}$ "", depth over tubes and transformers  $3\frac{1}{8}$ ". The chassis has a light durable finish to harmonize with the RELAYDIAL frames and cabinets. It is arranged to mount directly on relay mounting strips or by means of P-34390 Brackets to power panels or the side of a cabinet. Tubes used are two 12SK7.

No. 224 generator operates from current supplied at 24 Volts and the No. 248 from 48 Volts. Operating current to start and operate the generator is usually controlled by relay contacts which are wired to Busy Tone Start (BTS) and Dial Tone Start (DTS), terminals of the generator chassis.