SELECT-O-PHONE DIVISION
KELLOGG SWITCHBOARD & SUPPLY CO.
310 West 6th Street • Kansas City, Missouri

SELECT-O-PHONE INSTALLATION AND REPAIR MANUAL Circa 1954

Manual for the installation and repair of the Select-O-Phone system using the Kellogg 500 series telephones made for the SOP and designated the 530.
The “redbar” 1000 series is mentioned as being obsolete.

Scanned from original documents in the JKL Museum archives
Adobe Document Produced by Mike Neale
www.kelloggtelephone.com

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9 Dec 2009

TECHNICAL MANUAL FOR INSTALLATION AND MAINTENANCE OF SELECT-O-PHONE

Price 2.50 each

TELEPHONE SALES & SERVICE COMPANY
25 DEFOREST ST. AMITYVILLE, NEW YORK 11701

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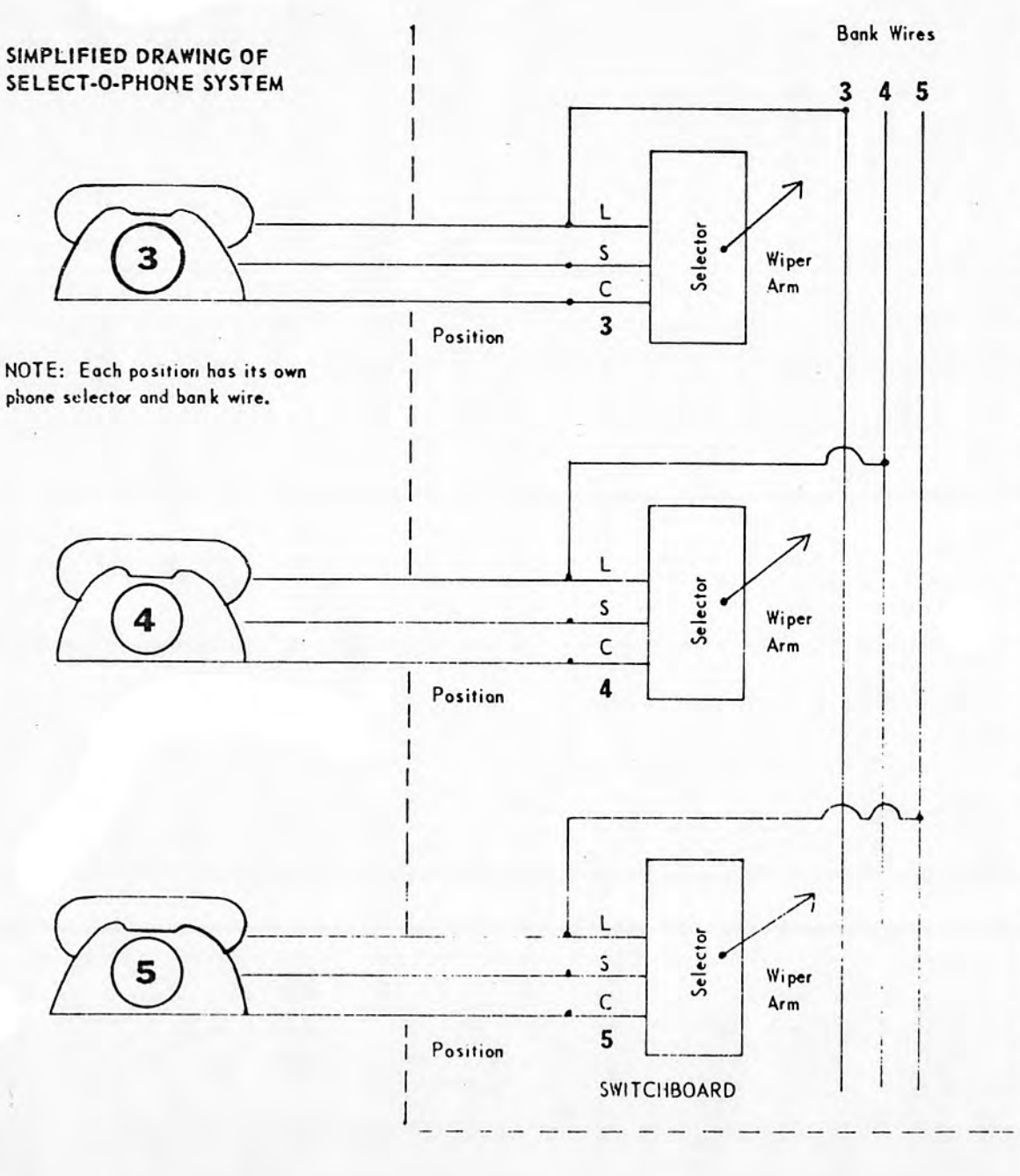
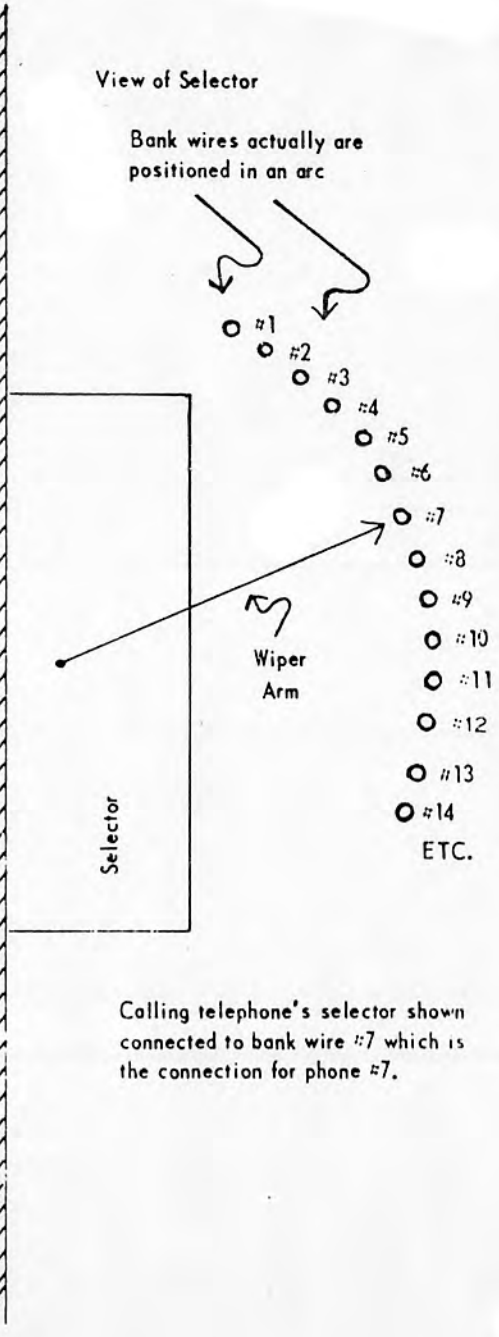

SIMPLIFIED DRAWING OF
SELECT-O-PHONE SYSTEM
Bank Wires
3 4 5
3
4
5
L
S
C
Selector
Wiper
Arm
Position
3
4
5
NOTE: Each position has its own phone selector and bank wire.
SWITCHBOARD


View of Selector
Bank wires actually are positioned in an arc
#1
#2
#3
#4
#5
#6
#7
#8
#9
#10
#11
#12
#13
#14
ETC.
Wiper
Arm
Selector
Calling telephone's selector shown connected to bank wire #7 which is the connection for phone #7.

TELEPHONES

530**(B)30R	Desk Telephone	(Standard or Extension)
550**(B)30R	Wall Telephone	(Standard or Extension)
534**(B)30R	Secretarial Extension	

**Insert color codes in place of asterisks

The available color codes are:

00	Black	11	Rose Pink
02	Red	12	Aqua Blue
04	Yellow	13	Light Beige
05	Green	14	Light Grey
09	Ivory	15	White
		16	Sea Green

SELECTORS

30()970	Privacy Selector (Standard) (Replaces I-32)
33()970	Cut-In Selector (Right-of-Way)

SWITCHBOARDS

12(1)960	Switching Unit wired for 12 lines, General Call Circuit and Busy Circuit and Busy Unit.	36(1)960	Switching Unit wired for 36 lines, General Call Circuit and Busy Circuit and Busy Unit.
24(1)960	Switching Unit wired for 24 lines, General Call Circuit and Busy Circuit and Busy Unit.	55(1)960	Switching Unit wired for 55 lines, General Call Circuit and Busy Circuit and Busy Unit.

BATTERY ELIMINATOR

3386	4.0 amp Battery Eliminator

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EQUIPMENT DESCRIPTION AND OPERATION

TELEPHONE

A telephone is a unit consisting of the following components:

Transmitter – For transmitting the message.

Receiver – For receiving messages from other phones.

Main Circuit – Adjust the applied voltage for proper voltage across each unit for each operation.

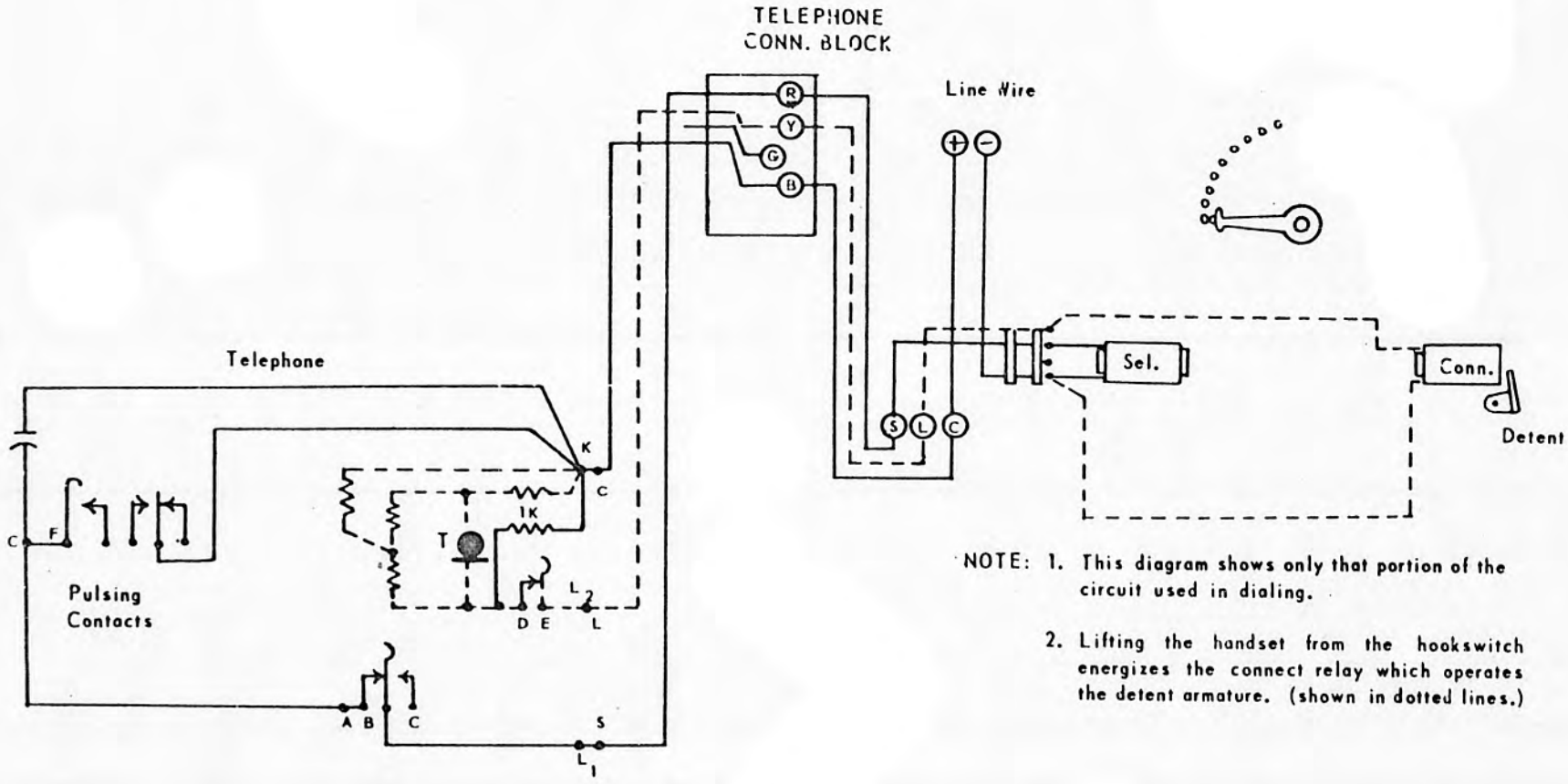
Dial – Enables pulses to be sent to the selecting unit (selector) which follows these pulses in selecting another telephone line for conversation.

Bell – Is an audible signal to indicate a call has been placed on the telephone.

Push Button – To allow complete control of the ringing operation to the called phone. Also enables ringing of extension telephones on a line. Paging signals can be controlled by this button.

Each standard telephone in a system requires a selector and a selector position in the switchboard. An extension telephone connects to a standard telephone line therefore does not require a selector or selector position.

SCHEMATIC OF SELECTING CIRCUIT OF SOP-530 SERIES TELEPHONES



NOTE: 1. This diagram shows only that portion of the circuit used in dialing.

2. Lifting the handset from the hookswitch energizes the connect relay which operates the detent armature. (shown in dotted lines.)

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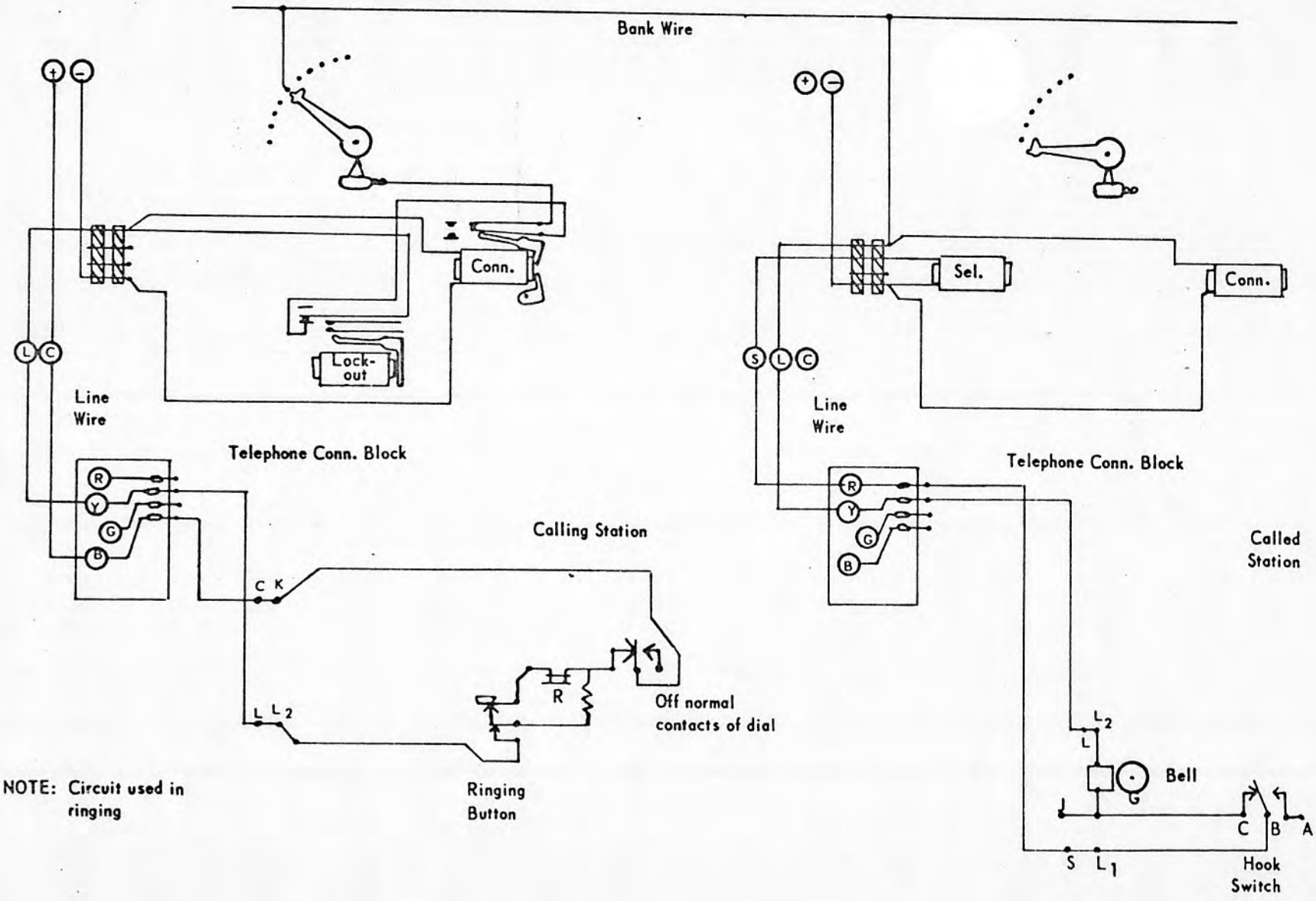
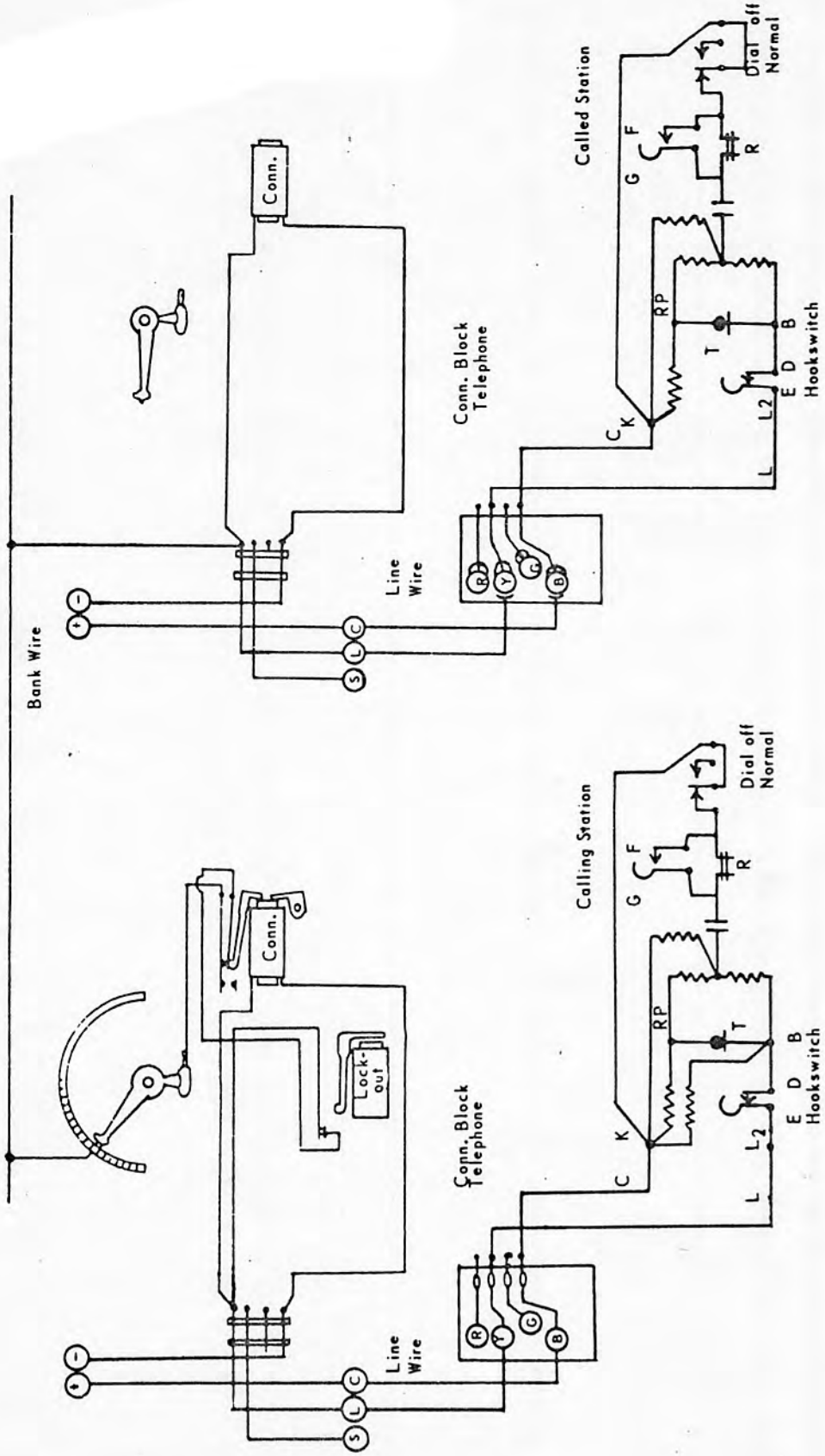
SCHEMATIC OF RINGING CIRCUIT FOR SOP-530 SERIES PHONES



NOTE: Circuit used in ringing

SCHEMATIC OF TALKING CIRCUIT FOR SOP-530 SERIES TELEPHONES



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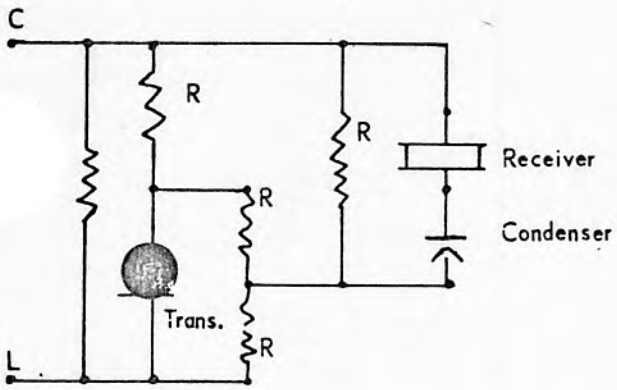
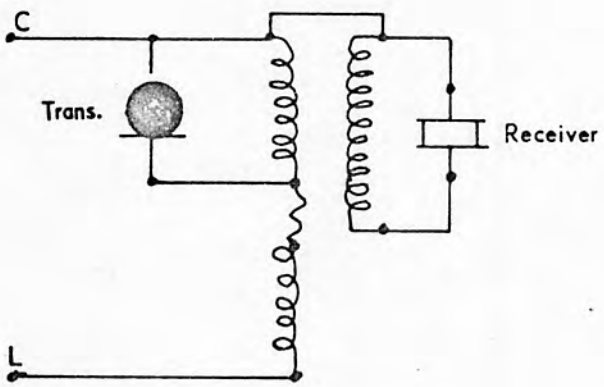
SIMPLIFIED DRAWINGS OF THE TALKING CIRCUIT FOR VARIOUS SELECT-O-PHONE INSTRUMENTS



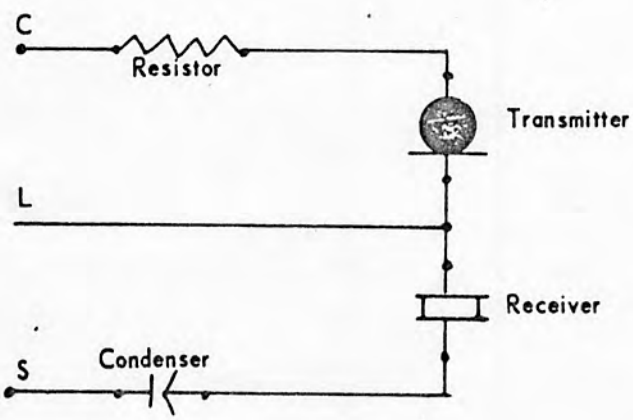
530 Series Telephones

HERE – Talking and receiving are accomplished over "C" and "L".



1017 Series Telephones
(Obsolete)

HERE – Talking and receiving are accomplished over "C" and "L".



1002 Series Telephones
(Obsolete)

HERE – Talking is accomplished over "C" and "L" and receiving over "L" and "S"

TELEPHONE OPERATION

To connect one telephone to another, the following steps take place in the order listed.

Lift handset – This operation closes contacts in the hookswitch completing a path from C (+voltage) through the resistance of the telephone and from the telephone through "L" conductor of the line to the selector and through the connect coil to negative (–) buss-bar. Approximately 6 to 8 volts DC will be present on "L" at this time. This voltage will pull in and hold the detent armature. The only duty the detent has is to hold the ratchet and wiper arm in position whenever the wiper arm is moved.

Dialing – This operation closes the pulsing contacts of the dial a number of times depending on the numbers dialed. Each time the pulsing contacts close, C is picked up at the dial and is sent through "S" conductor of the line and through the select coil of the selector to (–) buss-bar. The operation of the dial can be compared in a way to the operation of an adding machine. For example, consider the number 980. When the dial is rotated from number 9, it sends 9 pulses through the select coil of the selector, stepping the wiper arm up 9 steps. Now, for the second digit the dial is rotated from number 8 which steps the ratchet and wiper arm up 8 more times. For the third digit the dial is rotated from 0 which steps the ratchet up 10 more times. Adding up the steps of the ratchet we find that it has stepped up 27 times. The wiper arm of the selector is now resting on the terminal (bank wire) for position #27. The telephone having the number 980 is permanently connected to position #27. However, the path from the calling telephone to the called phone (27) is not yet complete.

Ringing – Pushing the ringing button puts C (+) on the L lead of the calling telephone. The L lead carries the C voltage of approximately 30 volts to the selector and through the connect coil of the selector. At this point remember that when the handset was lifted we applied approximately 8 volts on the L lead to operate the detent. Now we are applying approximately 30 volts on this same lead which pulls in the small armature of the connect coil. This armature is set to operate on approximately 30 volts. Once this armature pulls in, it will stay held in on the 6 to 8 volts already applied to this circuit. The reason for this is that the air gap is eliminated when this armature is pulled in and the lower voltage will hold this armature in the operated position. When the connect armature is operated it closes the "L" path in the selector, connecting "L" of the calling telephone to the wiper arm. The 30 volts DC is allowed through the wiper arm and through bank wire (27) to telephone (980) which is permanently connected to bank wire 27 (9+8+10=27) and through the closed contacts of the hook switch of the called phone and through the bell, back to the switchboard through "S" of the called line and through the select coil of the selector in position 27 to (–) negative buss-bar. Lifting the handset of phone 27 opens the bell circuit. The calling phone and the called phone are now connected for two way transmission of messages.

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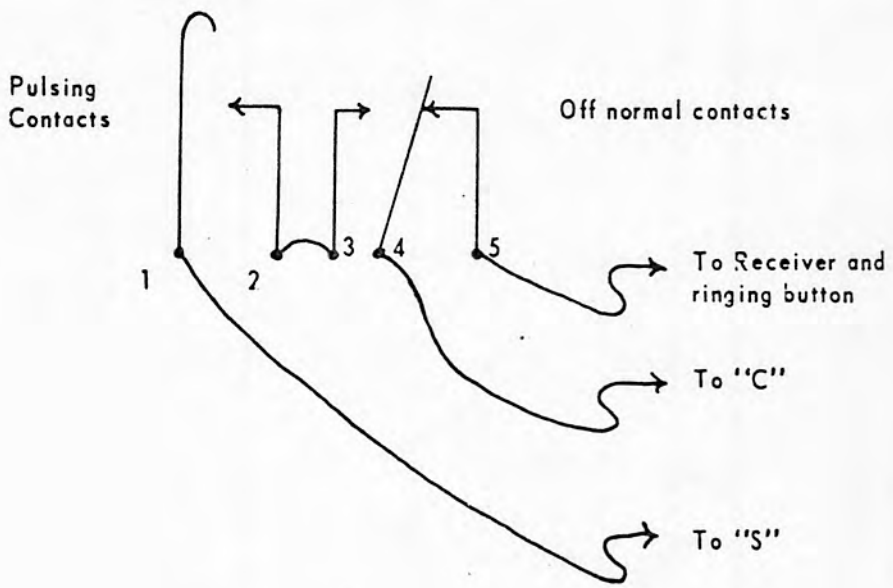
DIAL

FOR SOP–530 SERIES TELEPHONES

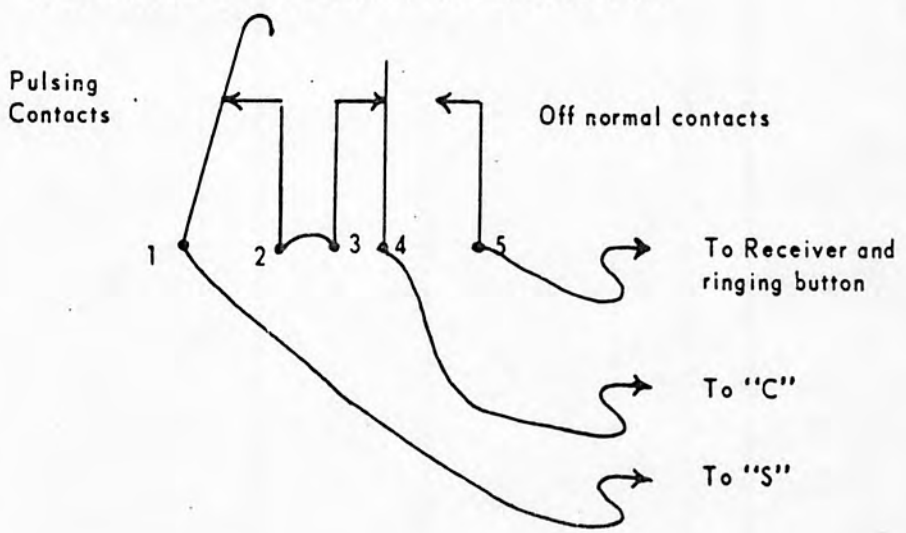
Pulsing contacts are opened and closed by the pulsing cam. The number of times they close after initial opening depends on the digits dialed.

With the dials off its rest position, the off normal contacts 4 and 5 are open thereby keeping the receiver and ringing button circuits open, contacts 3 and 4 are closed applying + "C" to contact 2.

DIAL CONTACTS SHOWN IN REST POSITION



DIAL CONTACTS SHOWN IN OPERATED POSITION



DIAL AND BELL OPERATION FOR SOP 500 SERIES TELEPHONES

Dial in rest position

The pulsing contacts are closed. The off normal contacts 3 and 4 are open and, 4 and 5 are closed which makes a connection from 4 to 5. Positive voltage (C) is supplied through these contacts and the receiver circuit is completed. The ring button circuit is also completed.

Dial off rest position

The receiver circuit is opened between 4 and 5 thus preventing dial clicks across the receiver, and "C" is applied to 2 thru 3 from 4. Also important to note is that the ringing button circuit is also opened between 4 and 5. Contacts 4 and 5 remain open as long as the dial is off its rest position.

The pulsing contacts 1 and 2 are opened and closed by the rotation of the pulsing cam.

When 1 and 2 close, positive voltage (C) is supplied to the "S" conductor of the line to the selector and through the select coil to (–) buss-bar thus completing the circuit. Each time contacts 1 and 2 close the wiper arm of the selector moves up one step.

BELL

The bell of the SELECT-O-PHONE instrument operates on approximately 24 to 30 volts DC. It is connected in all series telephones from line wire "L" through the bell coil and through contacts of the hookswitch (closed with handset on hook) to line wire "S" and through the select coil of the selector to (–) negative buss-bar. The bell will now operate anytime a (+) positive voltage of approximately 24 to 30 volts is applied to the "L" lead.

Under normal operation this can happen two ways:

1 – Pressing the ringing button of a telephone with the handset on the hook. This will apply (+) positive voltage to the "L" lead.

2 – When a calling phone presses his ring button thus applying (+) positive voltage on the bank wire of the called phone which continues to the "L" lead of the called phone.

When the handset of the telephone is off the hook, the contacts of the hookswitch opens the bell circuit of the telephone.

The resistance wire connected from the ringing button to the receiver prevents a complete short across the receiver when the ringing button is pressed. This allows the receiver to pick up a slight signal when the calling telephones bell is operating (revertive ringing). The receiver is partially shorted when the button is pushed to prevent loud clicks from being heard due to the large change of voltage.

Since the return path to (–) buss-bar of the bell goes through the select coil "why doesn't the armature of the select coil operate?" Since the resistance of the bell is approximately 200 ohms it prevents the high current flow necessary to operate the select coil.

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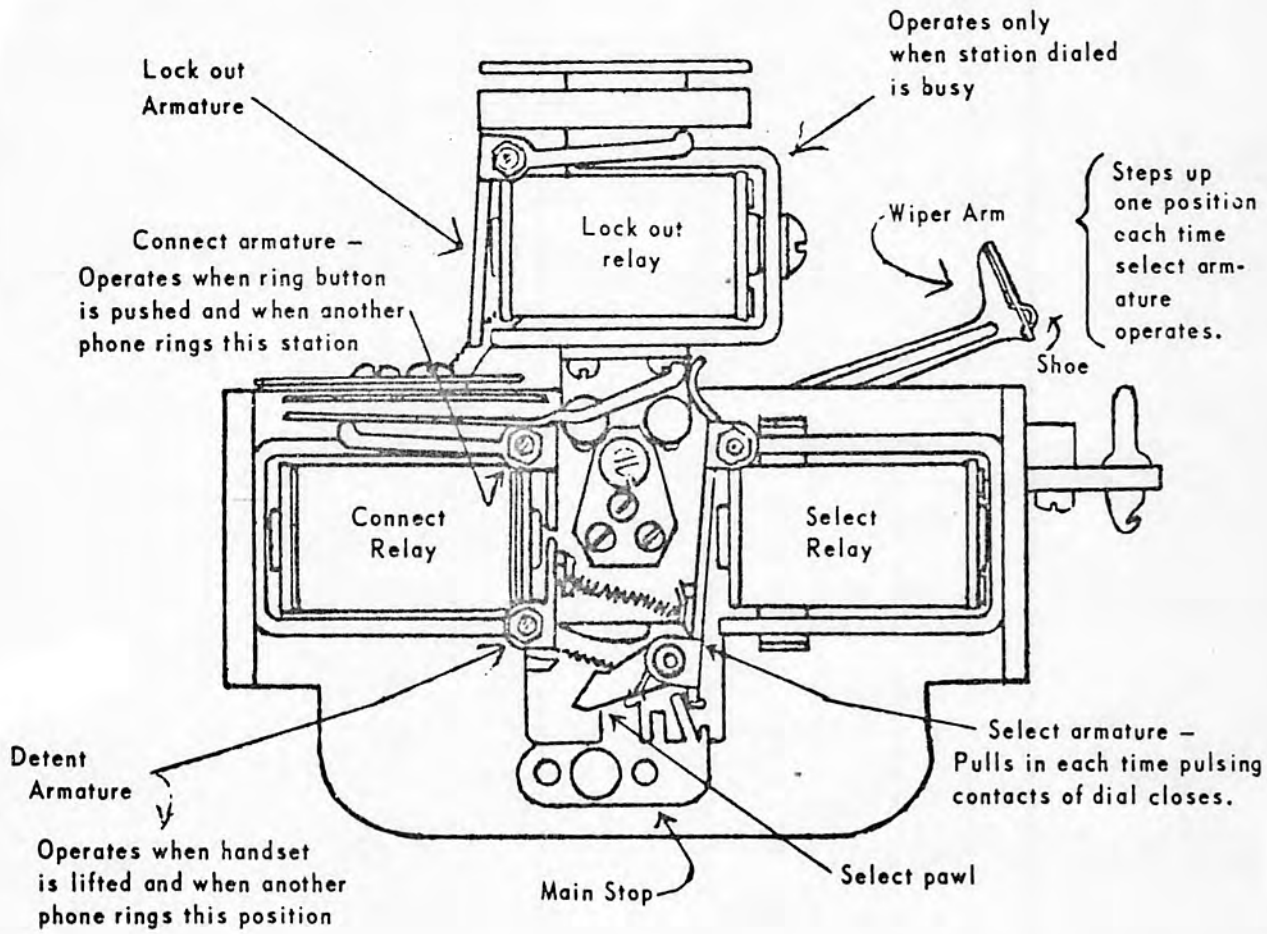
SELECTOR

The selector shown below is the standard 30 ( ) 970 selector. The bottom view is shown to enable major parts to be seen.

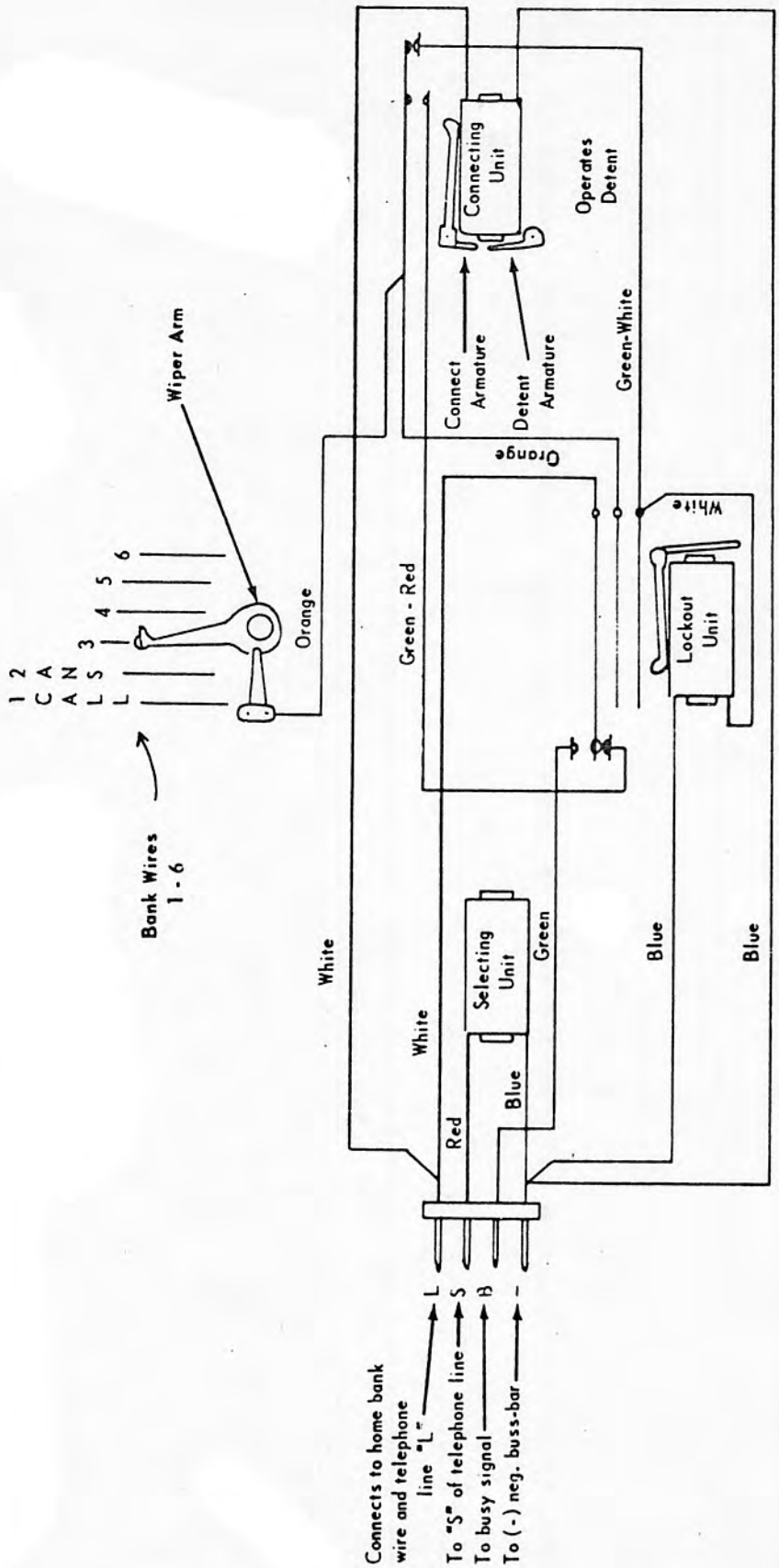
The 33 ( ) 970 cut-in selector is identical to the 33 ( ) 970 with two exceptions:

1 – It does not have the lock out relay.

2 – It has a condenser to block D.C. in the "L" circuit.



STANDARD SELECTOR



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SELECTOR

Each telephone is permanently connected to its own selector in the switchboard.

The selector is a stepping switch that follows the dial pulses of the dial in selecting and making the connection from the calling telephone to the called telephone. It also connects the busy signal to the calling station if the called station is busy.

The selector has 3 relays and a ratchet gear with wiper arm. Two of the three coils have spring contacts which are actuated by the armatures of the relay.

These relays are:

1 – Connect relay – two operating armatures.

A – Detent armature – Pulls in small arm (detent) against stepping gear (ratchet) to hold gear in place when it is moved. With the handset of the telephone off the hookswitch, approximately 6 to 8 volts is applied across this coil. This voltage pulls in and holds the detent armature.

B – Connect armature – Operates the spring contacts of the connect relay which when operated connects "L" of the telephone to the wiper arm. Another pair of contacts opens the coil circuit of the lock out relay opening the busy circuit once a connection is made.

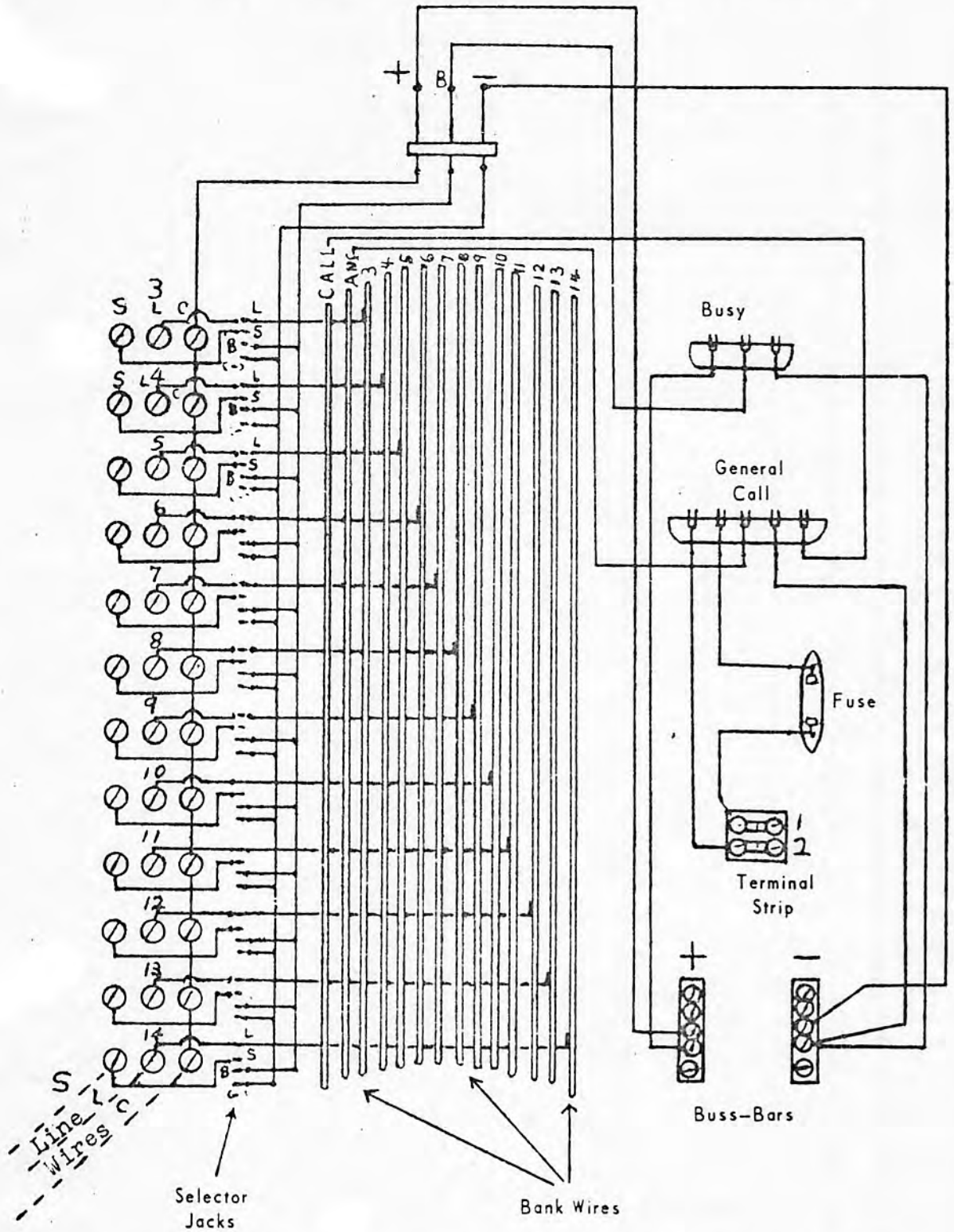
After the handset of the telephone is picked up and the dialing operation completed, the ringing button is pressed. Pressing this button shorts out the resistance of the telephone and applies approximately 30 volts across the connect coil. This increased voltage will pull in the smaller of the two armatures of the connect relay and complete the "L" path of the telephone to the wiper arm of the selector. When the "L" path is completed there is a path from the calling telephone to the called telephone for ringing and talking.

When the ringing button is released the connect armature will stay in on approximately 6 to 8 volts because the air gap is eliminated. Both the called station and the calling station must hang up their handsets before the connect armature and the detent armature return to the rest position.

2 – Select Relay – This relay is operated by the dial pulses from the dial. Each time the pulsing contacts close, a 30 volt pulse is sent through the coil of this relay which pulls in the armature and by a mechanical linkage steps the selector up one step.

3 – Lockout relay – This relay operates only when the station dialed is busy. The dialing operation steps the ratchet of the calling phone up to connect its wiper arm to a bank wire of a particular telephone station. If the telephone handset of the called phone is off the hook, there is approximately 6 to 8 volts on the bank wire of the called station. When the wiper arm of the calling station's selector connects to the called station's bank wire the voltage present is applied across the lockout relay of the calling phone's selector. Thus operating the lockout relay and sending a busy signal to the calling telephone.

WIRING DIAGRAM AND PHYSICAL LAYOUT OF A 12-LINE SWITCHBOARD



If there is more than one rack, bank wires in one rack are connected in parallel to the bank wires in the next rack or racks. A rack is a frame holding one set of bank wires and having positions for 12 selectors.

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SELECT-O-PHONE SWITCHBOARDS

A switchboard is a cabinet housing the following:

1 – Selector rack or racks

A rack is a frame for mounting up to 12 selectors. One selector for each telephone line. It also holds bank wires in place. One for each station in the switchboard. The rack is equipped with a terminal strip having 3 screw type terminal connections (S, L, and C) for each telephone line.

2 – Busy signal and circuit.

3 – Paging circuit for either Voice or Signal paging.

4 – A positive (+) buss-bar and a negative (–) buss-bar for connection to the power supply.

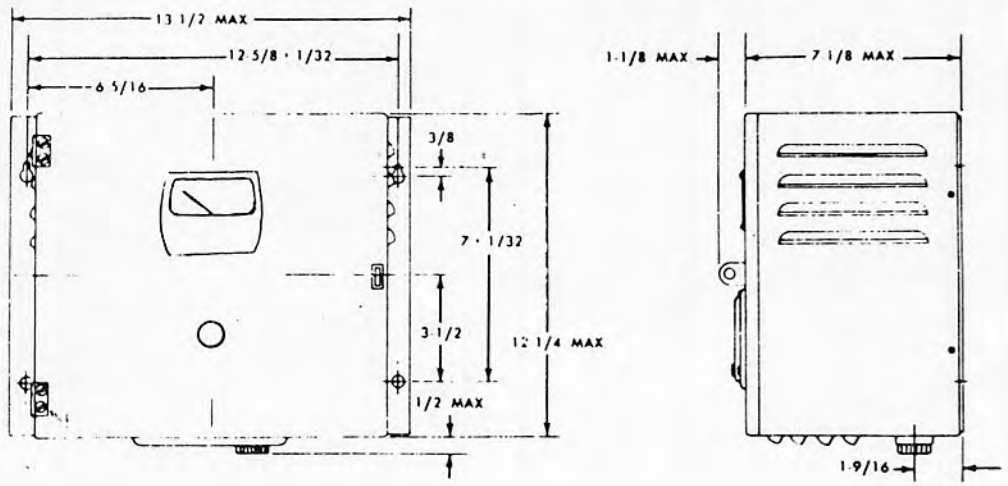
5 – All standard switchboards are wired for their ultimate capacity.

6 – The conference feature is also included in the standard equipment.

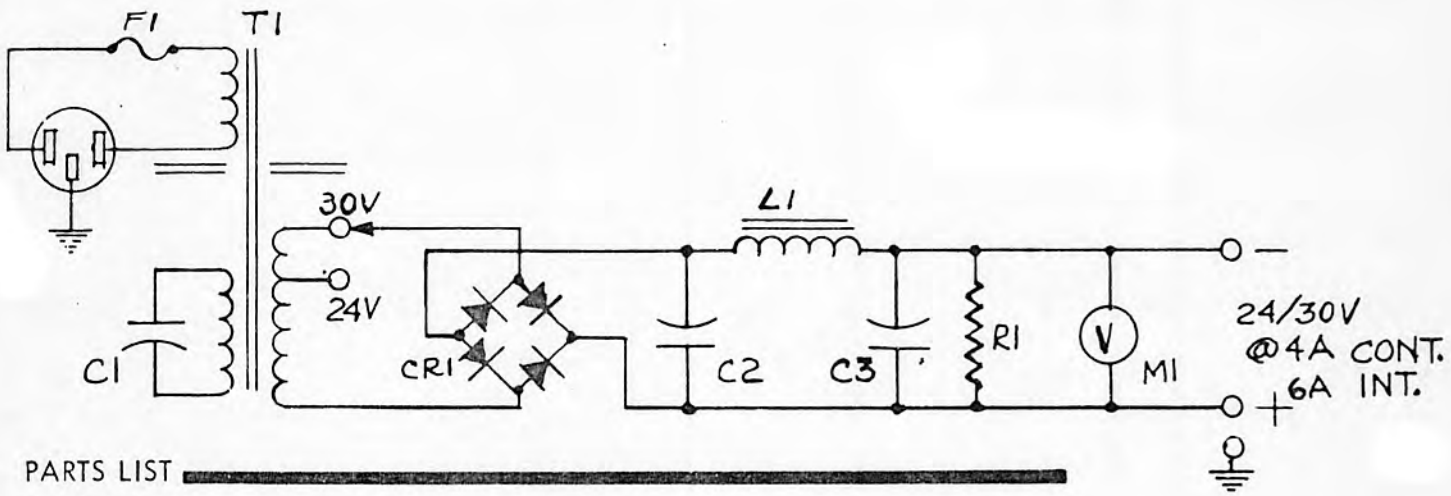
7 – Because of its design, 100% trunkage is a standard feature.

ALL SELECT-O-PHONE switchboards are designed for wall mounting and are finished in office gray. Extension telephones can be added to each telephone position in the switchboard.

MOUNTING DIAGRAM



SCHEMATIC DIAGRAM



PARTS LIST

SYMBOL	DESCRIPTION	PART NO.
C1	Cap., 2 mfd, 660 Vac	24-3930-5
C2, C3	Cap., 8000 mfd, 50 Vdc	24-2299-9
R1	Res., 100 ohms, 25W	27-741
CR1	Rectifier	26-173-3
M1	Voltmeter 0-40 Vdc	94-549-3
F1	Fuse 3A, 125 Vac	42-882
L1	Choke	127-1756
T1	Transformer	126-2860

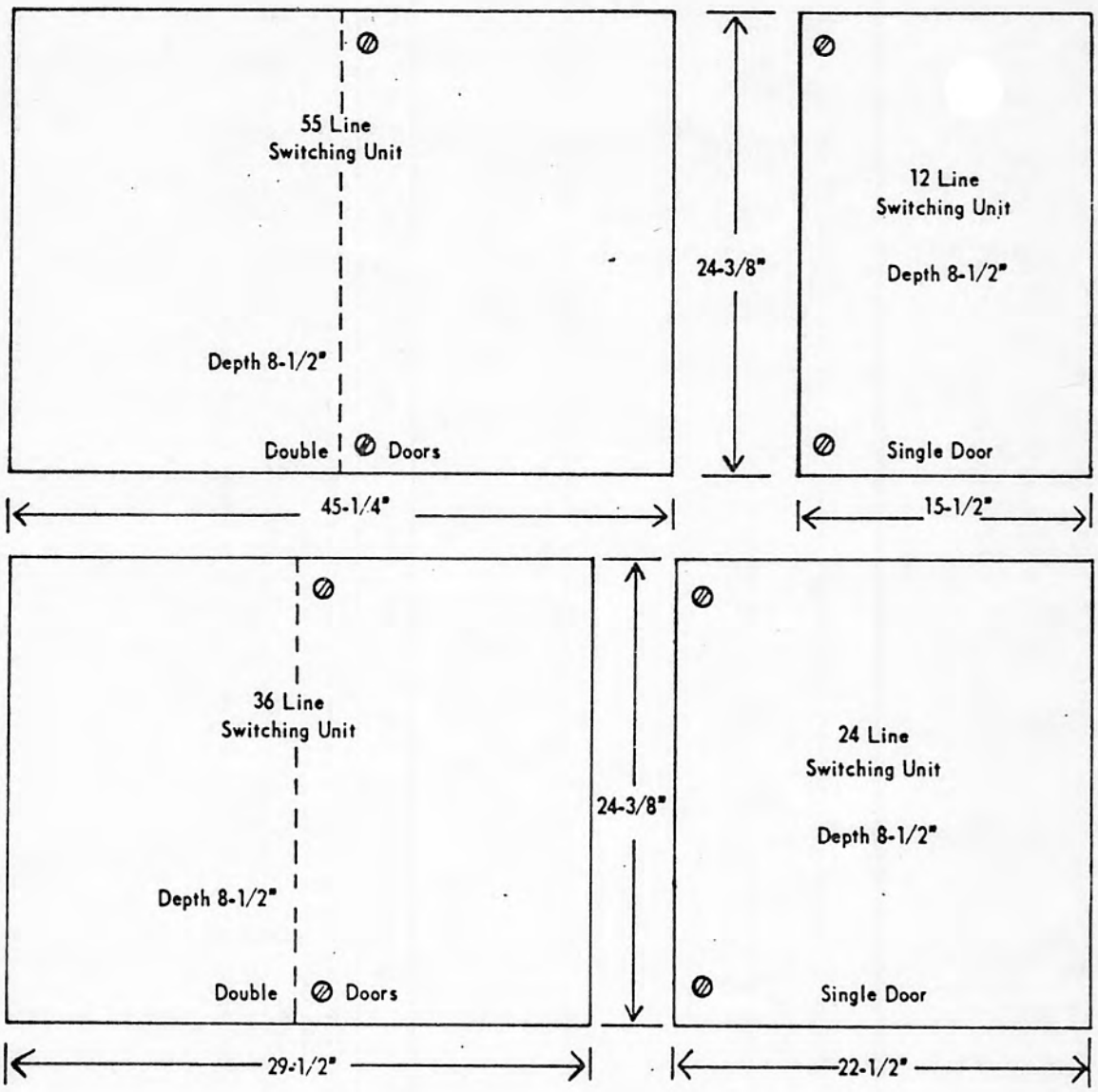
STANDARD ACCESSORIES SUPPLIED

1. Input Fuse
2. DC Voltmeter
3. Input Cord and Plug

OPTIONAL ACCESSORIES

1. Fungus proofing
2. Export packing

DIMENSIONS OF SWITCHBOARDS AND POWER



Equipment shown on this page designed for wall mounting.

POWER

A SELECT-O-PHONE system is designed for 30 volt direct current operation. At no time shall the voltage go below 29 volts or above 32 volts.

The average 12 line switchboard requires from 1 to 2 amps of current.

The average 36 line switchboard requires from 2 to 4 amp.

The average 55 line switchboard requires approximately 4 amps.

The power supply can consist of a battery eliminator designed for telephone operation, dry cell batteries, or storage batteries with battery charger.

TELEPHONE LINE

Each standard telephone requires 3 conductors (wires) from the switchboard to the telephone. When selecting wire follow the wire chart for the proper wire. An extension phone requires 4 conductors (wires) from the first telephone on the line.

FUNCTION OF CONDUCTORS

"C" – carries positive voltage from the switchboard to the telephone

"L" – is the talking and receiving path between telephones. It is also used for ringing both incoming and outgoing.

"S" – Picks up the positive voltage from the dial pulsing contacts and transfers it to the selector to operate the select coil each time the pulsing contacts close. This wire also acts as a return path through the select coil to negative (–) buss-bar for the bell of the telephone.

In other words:

1. "C" and "L" are used for talking and listening
2. "C" and "S" are used for selecting
3. "C" and "L" provide path for detent coil
4. Calling phone uses "C" and "L" for ringing out.
5. The current that rings the called phone is carried through lines "L" and "S" of the called line.

Four wires are required for the extension phone to enable the bell circuits of both phones on one line to be opened when either handset is off the hook.

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INSTALLATION

In preparing for the installation of a SELECT-O-PHONE system, the installer should thoroughly read the literature covering the equipment purchased, so that he will be familiar with the service which the purchaser of the system expects to obtain.

With the information herein, it is possible to properly plan the system, and determine the wall space required for the Switching Unit and Power Plant.

Do not install or connect equipment other than that obtained from the SELECT-O-PHONE Division to any unit of the SELECT-O-PHONE System. Such connections will not only void the guarantee on the equipment, but may damage various electrical units and cause operating trouble.

Wire of all sizes, wiring materials and common sizes of interior dry braid and lead sheath cable are stocked at the factory.

SWITCHING UNIT LOCATION

The SELECT-O-PHONE Switching Unit and its power equipment should always be installed in a clean location, free of moisture, dust or excessive vibration. The temperature location for the switching unit is not extremely critical, but it should not be placed where it might be exposed to extremely hot temperatures such as next to a boiler, nor in a location which does not receive heat in winter, where the Switching Unit might reach a temperature close to freezing or a room where the temperature varies throughout each day. Excessive vibration should be avoided as might be encountered on a wall on the other side of which shafting or motors are bolted. SELECT-O-PHONE Switching Unit and power unit are of the wall mounted type and the wall space required for the different size switching units and for the power unit is indicated on the drawing succeeding the switchboard section.

If a large number of lines must run from the Switching Unit to a number of telephones grouped at one location, it is most economical to find a Switching Unit location close to the large group of telephones, so that the longer lines are confined to the smaller number of telephones. The SELECT-O-PHONE power unit should always be mounted adjacent to the Switching Unit. When a DC type of power plant is used, requiring a battery, the battery should be located within 25 feet of the Switching Unit and should be wired with rubber covered copper wire, #14 or larger. (Whenever possible it is preferable to mount the SELECT-O-PHONE battery in the same room as the Switching Unit but the battery must not be placed underneath the Switching Unit where fumes which arise from the battery when charging would rise and enter the Switching Unit equipment. This consideration does not arise with a power unit type of power plant, and it is desirable to mount this adjacent to the SELECT-O-PHONE Switching Unit).

WIRING

After the location for the Switching Unit has been determined, wiring may begin. It is important in planning the wiring for a SELECT-O-PHONE System to compare the length of runs from the Switching Unit to each telephone location with the length of run chart shown at the end of this section. When any question arises regarding the length of a particular run, use the larger size wire of the two sizes which might be in question, for absolute safety. At the Switching Unit end of the wiring leave about 5 feet of wire, in order to reach all parts of the Switching Unit with the end of the wire after it enters the Switching Unit Cabinet. At the telephone end of the line, leave sufficient wire to reach the location of the conn. block of the telephone, which is connected to the telephone with a 5 foot desk cord. This conn. block is normally screwed underneath a desk, or if the desk is placed near a wall, the conn. block is best mounted on the wall adjacent to the desk, and the line wire should be brought to that proposed location. Always leave approximately 3 feet of wire at such a point until the installation is actually made and the requirements finally known.

If the building in which the installation is to be made has much wooden construction, such as wooden partitions and wooden floors, it is usually preferable to use the open style of wiring. Open wiring consists of fastening the wire from the Switching Unit location, by means of wiring staples, and running the wire along corners of partitions, on top of molding, along baseboards, and finally to the location of a telephone, without the use of conduit or splices. Open wiring is also preferable when a possibility exists of having to move a telephone location within a short period of time, as it is often

possible to move a line merely by pulling out the staples, and running the wire in a different direction, without the need of using new wire. Open wiring may be fastened either with telephone wire staples, or wiring nails.

When wiring with #19 or #18 copper interior wire, use #5 staples or 5/8" wiring nails. If wiring with weatherproof wire of #18 or larger use #7 staples, or 7/8" wiring nails. By planning the use of a coil of wire before the lines are actually run, it is possible for the installer to use a continuous length of wire for each run. However, if a length of wire is found too short to complete a run, a piece may be added on: the splices should be staggered and each of the three wires covered with at least one layer of rubber or plastic tape. Two or three layers of friction tape should then be wrapped around the entire splice. Never attempt a splice in any type of electrical wiring without first twisting the wires closely together, so that they are mechanically tight, and then solder the connection with a soldering iron sufficiently hot to cause the solder to flow thoroughly into the juncture.

When several wires are to run in the same direction for a considerable distance, considerable time can be saved by the use of messenger or bridle rings. These are similar to large screw eyes, with an opening in the eye, so that wires may be inserted into the hole simply by slipping them into the opening. In this manner, a run of several feet can be made simply by screwing a row of bridle rings into a ceiling or wall, and slipping the various wires into these rings as the wiring proceeds. These rings are available in various sizes.

When the nature of the building or the requirements of the installation are such that the wiring must be concealed, an electrician should do the work. Concealed wiring may consist of running the wires in the conduit, which provides the best type of installation, or the wiring may run concealed in walls and partitions, and hardly visible after the installation is completed. In any type of wiring, whether concealed or open, the wires should be thoroughly protected where they run close to a passageway or where coming through a floor. Wires should always emerge from a floor near a wall or partition, and preferably through a piece of pipe or conduit at least 12" up from the floor. A minimum protection afforded a wire or group of wires coming up from the floor would be a length of wiring loom sufficient to prevent floor washing or mopping from reaching any of the wiring, as washing solution will damage the finest insulation.

If it becomes necessary to wire from one building to another, or for wires to pass into an open yard or driveway to reach another part of a building, the installer has a choice of running the wires underground using underground wire, or of stringing the wires overhead, using weatherproof wire. Wires that run out-of-doors must have lightning arresters at one end of the wiring before it enters the building, if the exposed length of run is less than 100 feet. For wiring exposed for distances greater than 100 feet lightning arresters must be used at each end before the wire enters the building. Lightning arresters are obtainable from the factory, and should not be overlooked.

When lead covered cable is to be used underground, this should be run in conduit laid in a trench at least 18" below the surface of the ground. Armored cable may be obtained on special order to be laid in the ground without use of conduit. In bringing out the lead cable at each end of the conduit, it should emerge within an enclosure at each end before it is spliced on to the various line wires to which it connects. Bringing a cable up within a building for splicing will afford the necessary protection to the splices from the elements.

When wires are to be run in conduit, the following table shows the number of lines of various sizes of wire which may be conveniently drawn into various sizes of conduit.

Instructions for wiring party lines, extension signals, General Call or any accessories are given under their respective paragraphs or in the literature covering those items.

WIRING TABLES

Lengths of runs permissible with various sizes of copper wire. (If party line, table is for run to furthest phone on line)

SIZE OF WIRE	MAXIMUM RUN
No. 22	450 feet from switching unit
No. 19	950 feet from switching unit
No. 18	1200 feet from switching unit
No. 16	1900 feet from switching unit
No. 14	3000 feet from switching unit
No. 12	4800 feet from switching unit
No. 10	7600 feet from switching unit

When wiring in conduit, the following table will be useful, showing the number of lines of a given

size which may conveniently be drawn thru various sizes of conduit. (Table allows freedom to insure easy pulling around bends and ells.)

Conduit Size	¾"	1"	1¼"	1½"	1¾"	2"	2¼"	2¾"	3"
19 Int. Wire	4	7	12	17	22	28	43	52	55
18 Int. Wire	4	7	12	17	22	28	43	52	55
18 Weather	3	5	9	13	18	23	35	44	50
16 Weather	2	3	6	10	13	17	25	30	36

If various sizes of wire are to be placed in a conduit, use the number shown above, for the largest wire in the group. Thus, if some #19's, #18's and #16's are to run together, use the clearance figures shown for #16 wire. This will avoid tearing of insulation, and jamming, when wires are pulled in conduit.

INSTALLING SWITCHING UNIT

For best operation, the switchboard should be mounted on a plywood panel approximately 3/4 inch thick.

The panel should be a few inches larger than the back of the switchboard. It should be fastened to the wall and adjusted to insure that it is flat. Hang the switchboard by the two top bolts. Insert the bottom two bolts, but do not pull tight, leave bottom bolts loose. Mount the switchboard on the wall with the bottom of the switching unit approximately 3½ feet from the floor, so that the various positions for connecting the wires will be easily visible.

Line wires should all be brought into the switching unit through the "knock-outs" provided for this purpose. The cover should be kept closed on the switching unit at all times it is not absolutely necessary to have it off, so that dust, dirt, or parts of wire which might be cut in the process of installing will not enter and interfere with the switching unit equipment.

The line wires may next be installed by connecting them under the terminals marked S, L, and C, placing the wire which is to go to #3 selector, etc., Number 3 position is reserved for the test phone temporarily, as will be explained further. When connecting the wires, follow a plan of tracer markings of the three wires, which on dry braid interior wire is red, green and yellow. On weatherproof wire the markings are usually one plain wire, one with a single raised thread, and one with double-raised threads. Therefore, when connecting the line wires under the three screws, connect the wire with the red marker under S, the one with the green marker under L, and the yellow one under C. When connecting the remainder of the line wires into the switchboard, repeat the color or code scheme at each position. If the color scheme has been followed throughout when making splices, etc., it will be a very simple matter to find the necessary wires when telephones are connected at the other end of the line. If the line wire is not coded, it will of course be necessary to "buzz" at least two of the three wires.

After the SELECT-O-PHONE power unit has been mounted next to the SELECT-O-PHONE Switching Unit, it must be connected to a circuit with 110 volts, 60 cycles current. This should be done by following regulations of the local underwriters. If the circuit in the room already has much more apparatus operating from it, which will vary the line voltage considerably, it is best to run a separate circuit for the power unit direct to the distribution panel, so that a line will be available having fairly constant voltage.

A pair of #14 (or larger) wires must next be connected between the D.C. output terminals of the power unit and bus terminals of the SELECT-O-PHONE Switching Unit, as shown in the blueprint which accompanies the unit. When the current has been turned on through the power unit, the Switching Unit receives its operating current, and the next step consists of connecting the telephones to their line wires at respective locations.

PARTY LINES

Although 3 line wires are required in the line between the Switching Unit and the extension station of the party line, 4 wires are required between the standard station and its extension. The extension station of a party line is that telephone to which the line wire is connected which comes from the Switching Unit. The standard telephone is that instrument which is connected to the extension station. Follow the diagram on the drawing furnished with the Switching Unit for connecting party lines.

When operating telephones in a party line circuit it is imperative that the user first listen in the receiver before dialing, to insure that the other telephone on the line is not in use. When one telephone of the party line has dialed out and the other one operates its dial, the first call will be disturbed and the wrong number will be obtained. To ring between telephones of a party line it is only necessary to press the ringing button before lifting the handset and without dialing.

INSTALLING TELEPHONE INSTRUMENTS

Connect one of the desk phones, or a spare or test phone, temporarily to #3 position in the Switchboard. This is done by matching the connections so that terminals S, L, and C, in the telephone terminal box are connected to the terminals S, L, and C, beside selector #3.

The connection of the line wires to the terminal boxes of the phones at the terminals S, L, and C may now begin. Phones should be mounted so that the dial is at eye level, and the instrument should not be placed in a doorway or at a point at which passers-by or workers carrying bulky objects will strike the instrument. Telephones should be placed so that they may be used without obstructing passageways, aisles or doorways.

When the color or marker code described under "INSTALLING SWITCHING UNIT" has been followed so that the red tracer is connected to the S terminal in the switching unit, the green tracer to L, and yellow tracer to C, it is a simple matter to follow the same colors at the telephone connection. Thus, the red wire will connect under the terminal screw S of the telephone, the green wire under L and the yellow wire under C. If weatherproof wiring is used, in which case the tracers are difficult to see on the wire, or if the colors have not been properly matched in splicing at some point along the line, the proper conductors can easily be determined by test. Assuming that the switching unit is receiving its current from the Power Plant as previously described, take the three wires of the line to be connected, and find the one which makes a spark when touched to either of other two. This wire is the C wire and should go under this terminal screw in the telephone. Connect the other two wires at random to the terminals S and L. Dial the number of the line on which you are working If the wires have been correctly connected, you should hear the busy tone in the receiver. If the busy tone does not result, transpose the wires on the terminals S and L and again call your own line number. You should now obtain the busy tone, if all connections are correct.

After the first telephone has been connected and made to function properly, the second one may be wired in like manner.

When connections at the various telephones are completed the test telephone may be removed from selector position #3 and the line for that selector may then be connected to #3 position, as were the other lines.

NOTE: All telephone lines should be tested from each telephone at least two times after completion of the installation before users are allowed to make the first call.

POWER UNIT

The volt meter on the power unit should show between 29 and 32 volts with no line in the system in operation, and not under 28 volts with 6 receivers off their cradles. The 110 volt line from which the Power Unit is operating, should be checked to make sure that it is not fluctuating excessively. It is important that the power unit be operating from a 110 volt line which does not have a number of small motors, etc., operating from it, with the result that the line AC voltage will go down or up above the nominal voltage, exceeding 5 volts. In other words, adjustments are provided on the power unit, so that it will operate properly from the voltage of 105, 115, and 125 volts. However, if the power unit is adjusted with the line voltage at 115 volts, and then at various periods during the day, this voltage should rise above 120 volts, it is very likely that the power unit would provide excessive voltage to the SELECT-O-PHONE system. An output voltage of over 32 volts from the power unit to the SELECT-O-PHONE system may cause bells and buzzers to vibrate after ringing buttons have been released, until receivers of the called stations have been lifted from their hooks. Also, this excessive voltage would shorten the normal life of the entire equipment. It is useless to attempt to correct phone trouble if the power supply does not provide the correct voltage. After finding that the 110 volt line voltage does not vary over a range exceeding 10 volts total at any time, proceed to stabilize the adjustments on the power unit as follows:

The line voltage adjustment on the power unit of low, medium and high, should first be adjusted for the proper range. If the line voltage is between 105 and 110 volts, put the adjustment on low. If the line voltage is between 110 and 120 volts, put the adjustment on medium. If this still provides too high a voltage, put the adjustment on high. This must be set so that the power unit voltage does not exceed 29 to 32 volts when all the receivers are on their cradles, and not under 28 volts with 6 handsets off their cradles.

The voltmeters of Power Units are set at the factory for correct reading at 30 volts. Do not change this setting, even though meter does not read zero, when the current is shut off.

Increasing cross talk in a system, taking place in a period of a few days or an increasing hum in the receivers of all telephones, may be an indication of the aging of the power unit condensers. These have a life of many years. New units for replacement, with instructions, may be obtained from the factory.

CONSTANT VOLTAGE REGULATOR

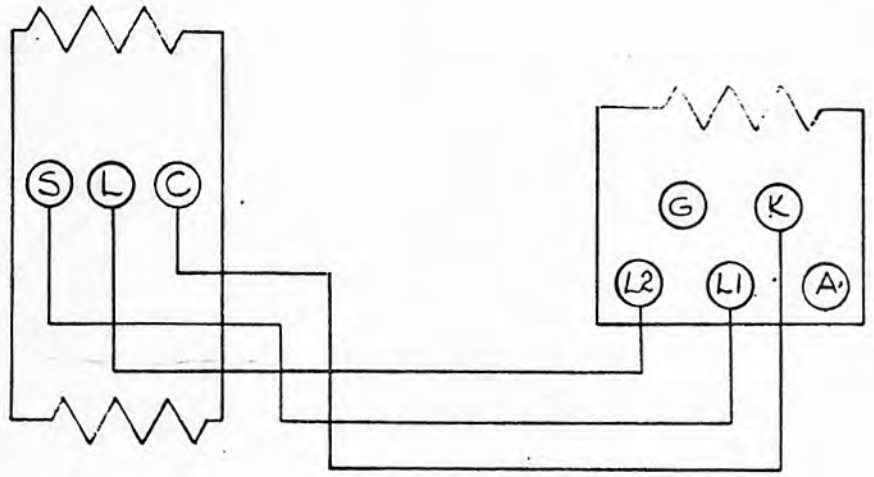
In any installation where the line voltage varies more than 5 volts either above or below 110 volts, 60 cycle AC, a constant voltage regulator should be installed. In some installations, especially in factories, the line voltage variation, if any, occurs when some of the large machines are shut off or during shift change or at plant closing time. It is best to consult the head engineer of the building where the installation is to take place. He can inform you of any line voltage problems.

Sola manufactures a good regulator that can be used.

Size of Battery Eliminator	Input Watts	Actual VA To Be Used	Closest VA Size Unit Available	Sola Constant Voltage Regulator Order No.
1 amp	60	110	120	CVH5004
2 amp	120	210	250	CVH5005
4 amp	192	265	500	CVH5006

CVH (is a constant voltage regulator with low harmonic distortion).

WIRING DIAGRAM FOR SINGLE DESK OR WALL PHONE



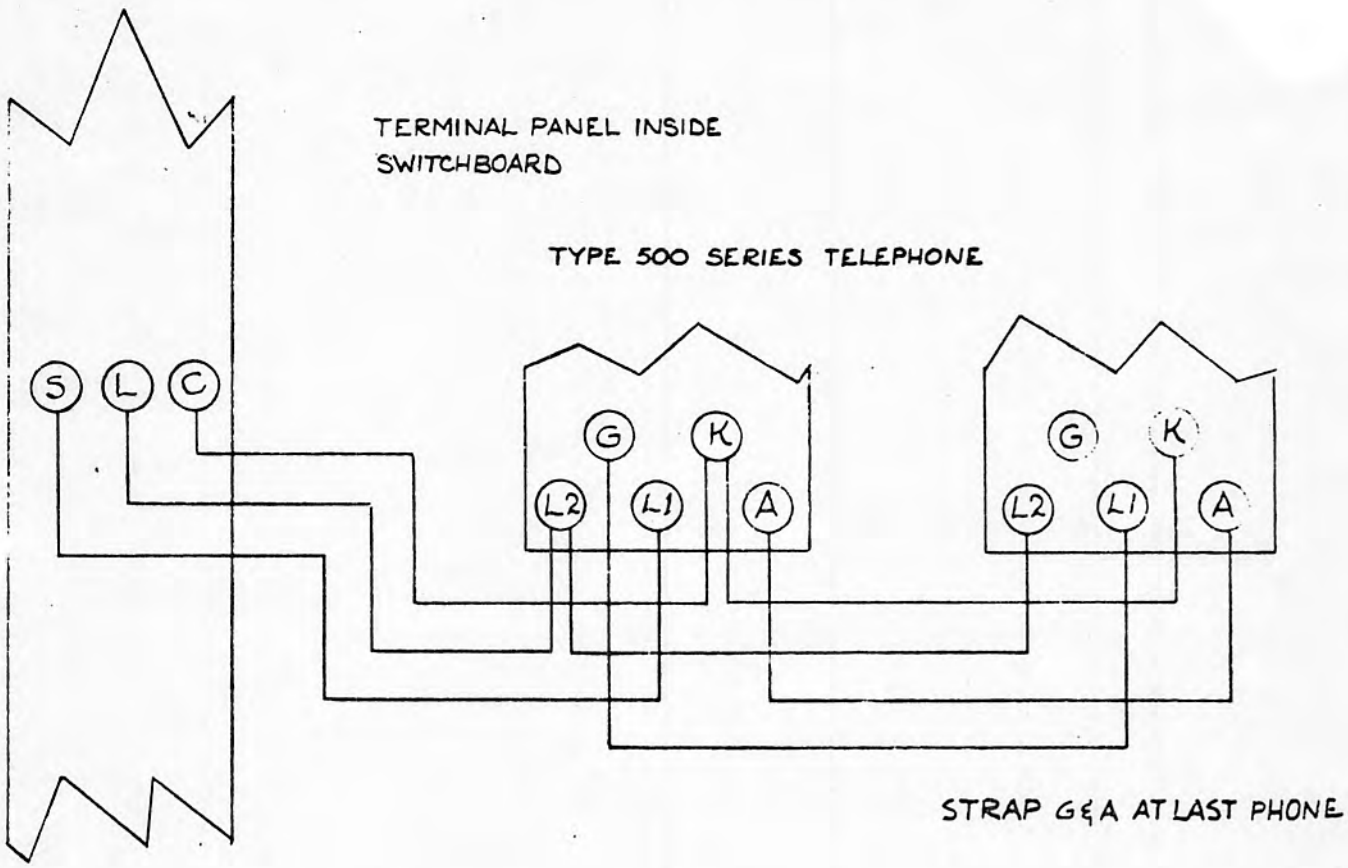
DESK PHONE STRAP BLUE & GREEN TOGETHER

DESK PHONE – MODEL 530
WALL PHONE – MODEL 550

NOTE -
FOR DESK PHONE SUBSTITUTE LINE CORD COLORS.
L1 - RED - S
L2 - YEL. - L
K - BLK. - C
G - GRN.
A - BLUE
BELL WIRES SHOULD BE ON L2 & G ON ALL PHONES

FIGURE 1

WIRING DIAGRAM FOR CONNECTING 2 TELEPHONES TO ONE LINE



NOTE

FOR DESK PHONES SUBSTITUTE LINE CORD COLORS

L1 - RED - S

L2 - YEL. - L

K - BLACK - C

G - GN.

A - BLUE

BELL WIRES SHOULD BE ON L2 & A ON ALL PHONES

FIGURE 2

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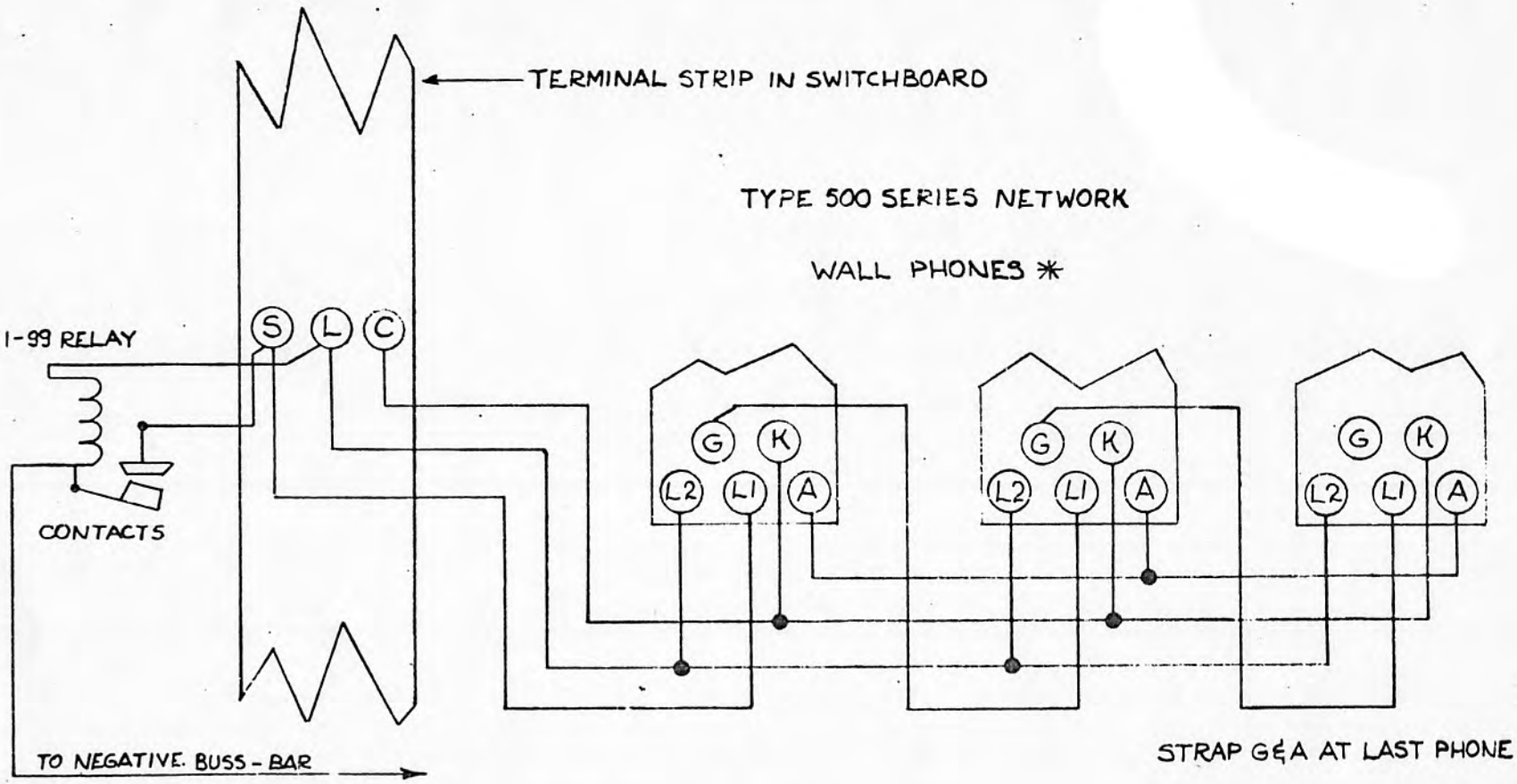
CIRCUIT DIAGRAM FOR CONNECTING 3 PHONES TO ONE LINE

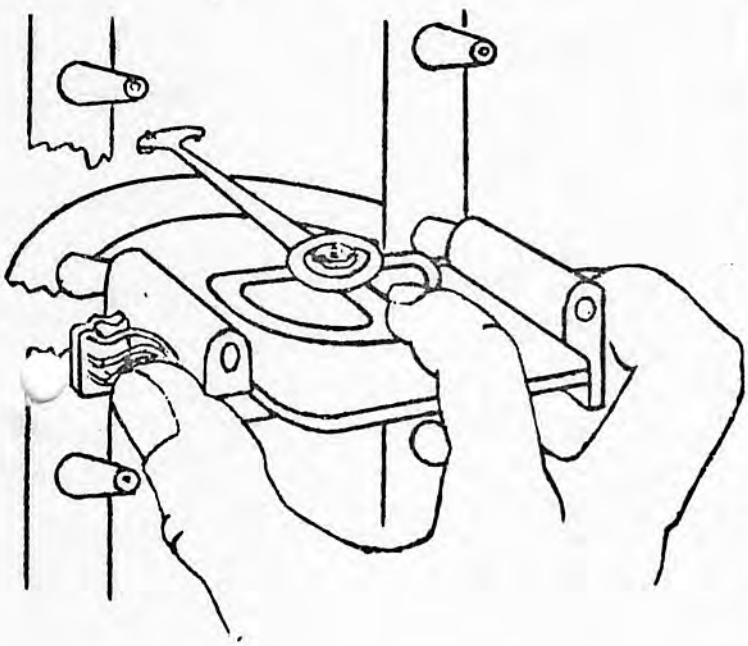


* FOR DESK PHONES SUBSTITUTE MUTE CORD
COLORS:
L1 - RED - S
L2 - YEL. - L
K - BLACK - C
G - GN.
A - BLUE
BELL WIRES SHOULD BE ON L2 & A
ON ALL PHONES.

FIGURE 3

INSTRUCTIONS FOR INSTALLING AND REPLACING SELECTORS

Before installing a selector always wipe the bank wires clean with a dry cloth until they are shiny. This is a very important step. Then hold the frame of the selector as shown placing one finger on the ratchet to hold it in the center position. Then slant the selector so the wiper arm will point slightly upward. Slide the selector forward on its posts, carefully noting that the wiper arm does not strike the selector above, or that it doesn't ride on the arc support. After the selector is fastened in place by its mounting screws always make sure the wiper arm rides freely across the bank wires. Be sure the selector returns to its resting position by its own spring tension after manually moving it up to the higher numbered bank wires. Also be sure that the wiper arm makes contact with each bank wire as it is moved to the right.



To remove a selector, unfasten the mounting screws and pull back on selector working it from side to side slightly so that it will come gradually and not be violently released and strike another selector.

SUGGESTED SELECT-O-PHONE DIALING SCHEME

Line Number	Digit Dialed	Line Number	Digit Dialed	Line Number	Digit Number
Gen. Call	1	20	901	39	9-000
Gen. Call Ans.	2	21	902	40	900-92
3	3	22	903	41	900-93
4	4	23	904	42	900-94
5	5	24	905	43	900-95
6	6	25	906	44	900-96
7	7	26	907	45	900-97
8	8	27	908	46	900-98
9	9	28	909	47	900-99
10	0	29	900	48	900-90
11	92	30	9-001	49	900-901
12	93	31	9-002	50	900-902
13	94	32	9-003	51	900-903
14	95	33	9-004	52	900-904
15	96	34	9-005	53	900-905
16	97	35	9-006	54	900-906
17	98	36	9-007	55	900-907
18	99	37	9-008	56	900-908
19	90	38	9-009	57	900-909

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4

SERVICING

SERVICE

When a trouble is first reported from a SELECT-O-PHONE station, consideration should be given to the fact that the user might not report the trouble correctly, and that it is the duty of the maintenance man to localize the trouble to one particular unit of the line, determining whether the telephone, the selector, or the line wiring is at fault.

It is always best to first make sure that the system is receiving the proper voltage from the power supply. The voltage should be between 29 and 32 volts. After making sure that the proper voltage range is being supplied to the SELECT-O-PHONE system, localizing of the trouble can continue.

Before servicing begins, it is well to be familiar with the numbering system used, and the method to use in arriving at the selector position for each particular telephone line. SELECT-O-PHONE, with its 100% trunkage is an additive system. Dial pulses are added to arrive at the line number called. Dialing the number 9 sends nine pulses to the selector to move its wiper arm up to the ninth bank wire. Dialing another nine (two nines or 99) takes the wiper arm up to the 18th bank wire which is the 18th line. The dial number 0 sends 10 pulses to the selector. Dialing 909 sends 28 pulses to the selector to get the 28th line. Therefore, you can establish the selector associated with any telephone station by knowing that station's dial number, ie, if a phone number is 906 you simply add 9 plus 10 (10 for the 0) plus 6 for a total of 25. The selector used by station 906 is number 25 and the selector number is indicated on the panel terminal strip inside the switchboard.

If the report is that wrong numbers have been reached, try to determine whether the calling station has called several wrong numbers, or only gets the wrong number when it dials one particular station. Receiving wrong numbers only when one particular station is dialed will prove the rare instance in which trouble at the called station will cause misoperation of the calling station. Normally, a person gets wrong numbers no matter which station is dialed, if the trouble is in the telephone or selector of the calling station.

After determining that the telephone consistently misoperates, proceed to prove that the telephone is at fault by the method of substitution. Remove the telephone from the line by loosening the terminal screws on the connecting block and disconnecting the line cord, and install in its place your spare telephone, or if a spare is not available, a telephone from another location which has been known to operate properly and which is less frequently used than the one involved. This may be removed from a store room or where several telephones are located within one room so that one of these persons may use one of the other telephones within the room. After the replacement telephone has been connected to the defective line, call various other stations and have other stations call into this phone to determine if it is now operating properly. Also call the number of that line, to determine if the busy tone is received, as should be the case. If the original complaint has been removed in this manner, consider the phone which has been removed as defective, and return it immediately for servicing.

If this substitution of phones does not correct the trouble, remove the selector in the switching unit attached to this line, and put in its place a spare selector. If a spare selector is not available immediately borrow a selector, as with the phone, from a line less frequently used than the one being serviced. If substitution of the selector clears the trouble, you know the one removed is faulty and it should be returned for servicing, or adjusted in accordance with the Emergency Field Repair Instructions. If neither one of these substitutions has cleared the trouble, it becomes apparent that only the third part of that station, the line wire itself, can be at fault. Finding trouble in the line wiring is usually a job for an electrician, and should be done after the line wire has been disconnected at the end, and from the telephone. In this manner, the electrician can proceed to test between the wires, and from the wires to a water, steampipe, or other ground.

POSSIBLE SOLUTIONS FOR SOME TROUBLE REPORTS

STATION GETS WRONG NUMBERS:

a) Let's assume that telephone 68 gets incorrect numbers consistently with no particular pattern noted.

Trouble can be in the selector so take out selector 14 (6 plus 8) and substitute a unit that is known to operate correctly. Check bad selector in a test position where you can watch the selector operate. If it is found to dial correctly the difficulty is probably caused by wiper arm sticking against the bank wires and thus preventing complete return to zero position. Polish bank wire with a dry cloth and adjust wiper shoe to ride freely over bank wires. Be sure shoe makes contact with all bank wires.

b) Let's assume that station 68 always gets one number too high, ie, when dialing 901 you get 902.

Trouble can be caused by position of wiper arm in relation to the ratchet. Loosen holding screw and center shaft nut on the selector arm and move arm back so as to line up properly with bank wires.

c) Assume that station 68 gets one number too low, ie, when dialing 901 you get 900.

Fix by same means as in b) above except move arm forward to line up properly.

STATION CANNOT CALL ANYONE, BUT CAN RECEIVE CALLS: -

Probable causes of trouble are:

a) Telephone dial isn't producing dialing pulses.

b) Selector arm is stuck at the top and is not returning to zero.

c) Selector arm is not making contact with bank wires.

d) Connect relay spring tension is too great preventing its operation.

To fix you can:

a) Plug in spare phone to determine that pulses are being produced. If not check the dial contacts for proper make and break and clean if necessary.

b) Release selector arm so it will return and fix travel stop to prevent sticking.

c) Readjust wiper tension against bank wires. Clean bank wires.

d) Release spring tension of connect relay.

STATION CAN MAKE CALLS BUT CANNOT RECEIVE CALLS: -

Probable causes of trouble are:

Contacts on ringer have become fouled. Phone will not ring when you press ring button with handset in place.

To fix you can:

Clean ringer contacts.

STATION IS COMPLETELY DEAD. CANNOT MAKE OR RECEIVE CALLS: -

Probable causes of trouble are:

a) Telephone line plug is out of junction box.

b) The "L" wire is broken.

To fix you can:

a) Put plug back in.

b) Locate line break and fix.

PHONE RINGS STEADILY UNTIL YOU REMOVE HANDSET:

Probable causes of trouble are:

a) Telephone line plug is part way out of junction box causing a short.

b) Ring button is shorted.

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To fix you can:

a) Push plug in.

b) Find and remove short.

RECEPTION BECOMES WEAK:

Possible cause of trouble -

Receiver is defective.

To fix:

Remove and replace

TELEPHONE SOMETIMES GETS TWO LINES AT ONE TIME: -

Probable cause of trouble: - Wiper arm rests on two bank wires.

To fix: - Remove selector and adjust wiper arm for proper position.

TELEPHONE GETS A DELAYED BUSY SIGNAL WHEN CALLED PARTY ANSWERS -- CALLED PARTY HEARS NOTHING: -

Probable cause of trouble:

a) Connect relay spring tension too strong.

b) Gap between arms on connect armature and select armature too small.

To fix:

a) Release spring tension.

b) Increase gap.

TELEPHONE DOESN'T GET BUSY SIGNAL AND BREAKS INTO CONVERSATIONS: -

Probable cause of trouble:

Lock out spring tension too strong.

To fix:

Release spring tension and reduce armature travel on lockout.

TELEPHONE GETS LOW NUMBERS ALL RIGHT, BUT CANNOT CALL HIGH NUMBERS: -

Probable cause of trouble:

Selector wiper arm doesn't contact high bank wires.

To fix:

Clean bank wires.
Adjust wiper arm shoe so that contact is made with all bank wires.

TELEPHONE STARTS TO RING EACH LINE AS SELECTOR IS DIALED UP: -

Probable cause of trouble:

Connect relay spring tension is too weak.

To fix:

Increase spring tension (be sure voltage is not too high).

WHOLE SYSTEM BECOMES COMMON TALK -- ALL OF A SUDDEN YOU HEAR OTHER PEOPLE TALKING.

Probable cause of trouble:

Rectifier filter capacitor has gone bad.

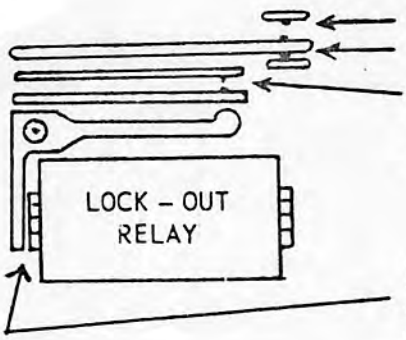
To fix:

Remove and replace faulty 200 MFD filter capacitor in battery eliminator.

I-30 SELECTOR (BOTTOM-UP) (EMERGENCY FIELD REPAIR SUGGESTIONS)

Ref. SOP-Sheet #10

This must be very round – if not round will stick on bank wires.
To make round – insert half-round object and smooth with thumb nail.



Busy tone contacts
Wiper arm contacts to line

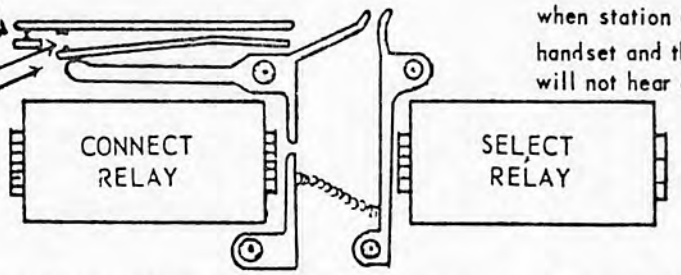
Spring tension light here-if too strong will not give busy tone when own number is dialed.

Movement of armature slight if too wide no busy tone when own number is dialed.

If this contact does not break when relay operates selector will buzz.

Wiper arm contacts to line.

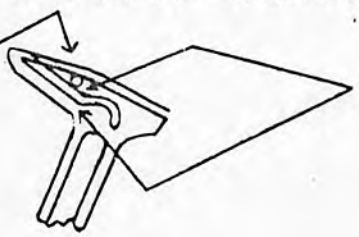
Gap should be around .010 with connect armature pulled in. If gap is too small, this station will get a busy signal when station called picks up his handset and the station called will not hear anyone on the line.



Spring tension very strong here and movement wide – If too strong will not ring – If too weak will cut in on busy line and WILL NOT GIVE BUSY TEST WHEN YOUR OWN NUMBER IS DIALED.

TO CORRECT TENSION OF WIPER SPRING

Insert point of straight pin here



Bend here with points of long nose pliers

THEN

Bend together here to straighten wiper spring. This will increase tension of spring. Then if too strong for shoe to move freely over bank wires, bend edge of shoe in to relieve tension.

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GENERAL INFORMATION

TELEPHONE

Dial - A dial that does not function properly can cause wrong numbers. If the pulsing cam does not close the pulsing contacts a number of times equal to the value of the digit dialed, wrong numbers will result. If these contacts are dirty it might skip a pulse or two. If the normally closed pair of off normal contacts are dirty the receiver may not operate properly. If these contacts do not make, the ring button and receiver circuits will be open.

Transmitter - If the transmitter resistance is too high it will not function properly. It may also allow the detent of the selector to fall momentarily during the dialing operation causing the ratchet to fall back a few steps resulting in wrong numbers.

Hookswitch - Contacts GF must break first when handset is replaced to prevent loud clicks. If contacts do not make or break properly misoperation will result.

Bell - If the bell contacts are dirty, it may not operate. A person may report that his phone does not ring when his number is called, but that he can place calls. This is usually caused by dirt on the bell contacts and the bell will not operate when a call is placed on this line. To check a telephone for this trouble simply push ring button with handset on hook. If bell does not operate, clean contacts.

Coiled Cord of Handset - If cord is worn and wires are broken either transmission or reception will be affected. Hold handset to ear, listen for cracking sound when cord is stretched and released. Cracking sound indicates bad cord.

Line Cord - Check for cracking sound in receiver when moving line cord.

SELECTOR

Wiper Arm - If the wiper arm does not return freely to its resting position by its own spring tension, wrong numbers will result. Polish bank wires clean with clean dry cloth.

For an example, the wiper arm of selector #7 sticks on bank wire #9. Telephone #3 dials telephone #9 – He will get both 7 and 9. If #3 dialed #7 he would also get both 7 and 9. Therefore, when checking a selector always glance over the other selectors to make sure the wiper arms of all selectors ride freely across the bank wires and are not sticking.

If the wiper arm is not aligned to the correct bank wire, a number higher or lower than the one dialed will be received. If the wiper arm touches two bank wires at one time, two stations will be received. By loosening the mounting nut of the wiper arm and adjusting screw, the wiper arm can be aligned to touch the correct bank wire. Before readjusting the alignment of the wiper arm be certain that the selector is adjusted properly and is stepping correctly.

Detent - If the detent does not pull in with the handset off the hook the selector will not step up. If the detent does not release when both phones end their conversation and hang up, the wiper arm will not return to its rest position. The next number dialed will be a wrong number because the selector won't start from the rest position.

Connect - If the connect armature does not pull in when the ringing button is pressed, the "L" path will not be completed to the called phone for talking and ringing. If the connect armature pulls in before the ringing button is pressed the calling party will not receive a busy signal if the called station is busy. If the spring tension against the connect armature is too strong, it may not pull in or it can cause a chattering noise in the receiver. If the spring tension is weak the connect will pull in before the ring button is pushed.

Lockout Relay - If the spring tension against the lockout armature is too strong the telephone will not get a busy when calling a busy station. If the space between the core of the coil and the armature (in the rest position) is too large, the lockout relay will not operate.

Contacts - Check all contacts for proper over travel.

Telephone Line - If the trouble is not in the phone or selector check the line wires for opens or shorts. Also check size of wire and length of wire with the wire chart.

Any equipment not recommended for use with SELECT-O-PHONE can cause all kinds of trouble. Telephone lines having more than two telephones on a line can cause trouble if not connected for this type of operation.

If it is found desirable to write the SELECT-O-PHONE Engineering Department for further servicing instructions, make sure you have provided a accurate and complete details of the fault, to enable the factory to send you correct advice. Always give the line number of the station in trouble and the line number called, also the number obtained. Advise if a station is in trouble by ringing wrong numbers, or if speech is affected. Describe what steps were taken to correct the trouble and why the method of substitution of parts did not prove the point of trouble clearly. In most cases troubles are due to simple causes, which have been overlooked because they are so obvious.

ACCESSORIES

I-79 UNIVERSAL GENERAL CALL UNIT

The I-79 General Call Unit is so arranged, that it can be used for either a General Call Signal Paging Unit or a General Call Voice Paging Unit; if necessary is can be adjusted to operate both General Call Paging and General Call Signalling circuits.

The I-79 General Call Unit will operate the I-95 Amplified Speaker direct, as a small General Call Paging System without additional equipment.

Operation - Dialing station #1 and pushing the ring button makes a connection from "L" of the telephone to bank wire #1 which is connected to terminal #4 of the I-79 General Call Unit. The circuit continues from terminal #4 to the matching transformer for the amplifier and through a 2 MFD condenser and back to terminal #3. The circuit continues from #3 through the normally closed contacts of relay "A" to (-) negative buss-bar to complete the circuit. An amplifier control relay (I-99) can be connected across terminals 3 and 4. The control relay must be adjusted to hold in on transmitter voltage which is approximately 6 to 8 volts DC.

Another telephone can dial station #2 to answer the page. Dialing #2 and pushing the ring button makes a connection to bank wire #2 which is connected to the I-79. The circuit continues through coil "A" and to the negative (-) buss-bar completing the circuit. This operation causes relay "A" to operate, opening its normal closed contacts, which opens the connection of the paging party to the amplifier. The party that dialed #2 then talks to the paging party through the condenser of the I-79 which is connected across bank wire connections for bank wires 1 and 2.

Note: Relay B was not used.

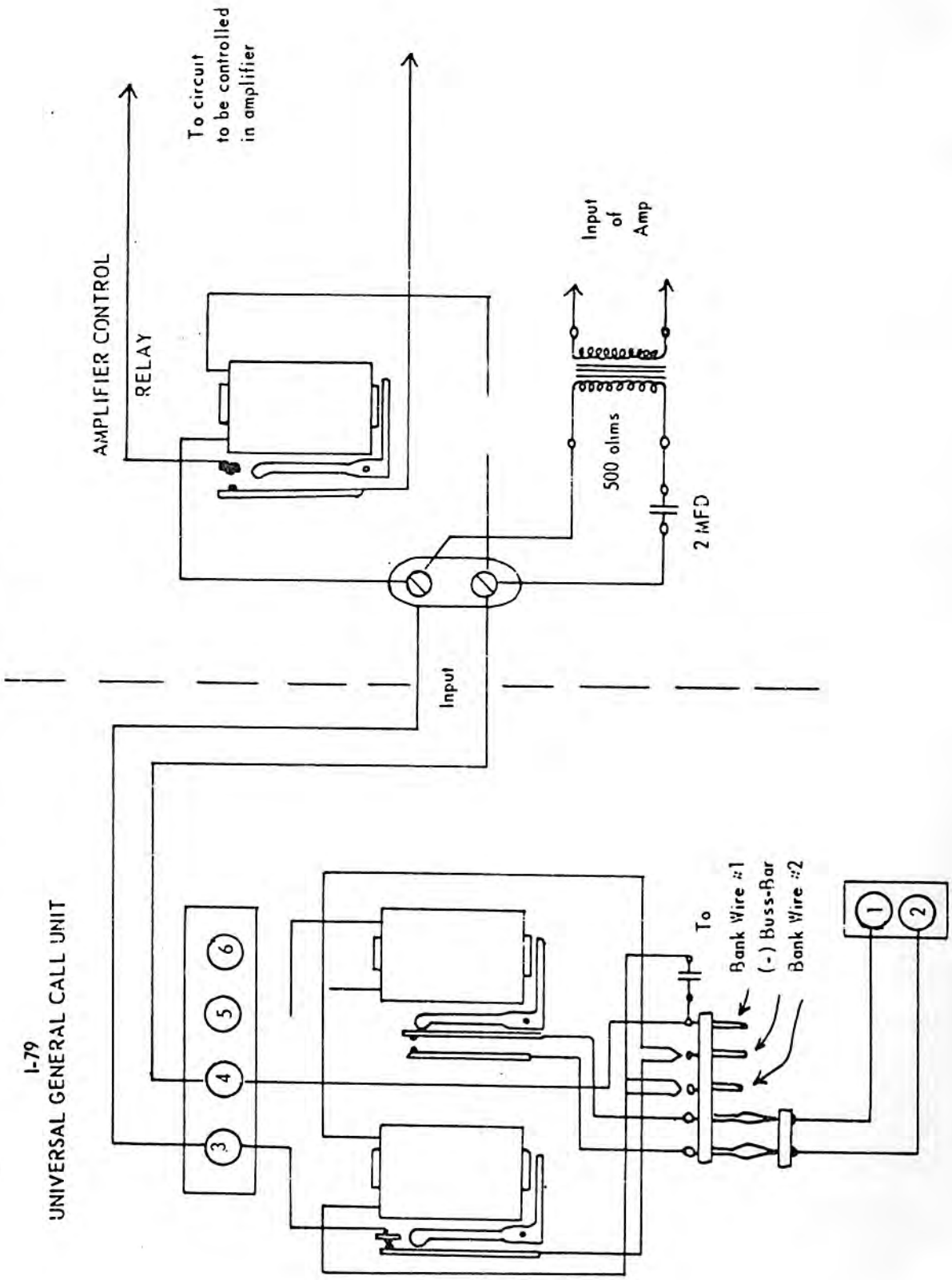
Relay B is used only to control another separate circuit which can be a signal paging circuit.

To make relay B operate, a jumper wire must be placed across terminals 4 and 5 of the I-79. Now, when station #1 is dialed "L" is connected to 4 and 5 and through relay "B" to negative buss-bar. The relay should be adjusted to follow the operation of the ring button by increasing or decreasing the spring tension of its armature.

The contacts of relay "B" open and close a separate circuit which must be added.

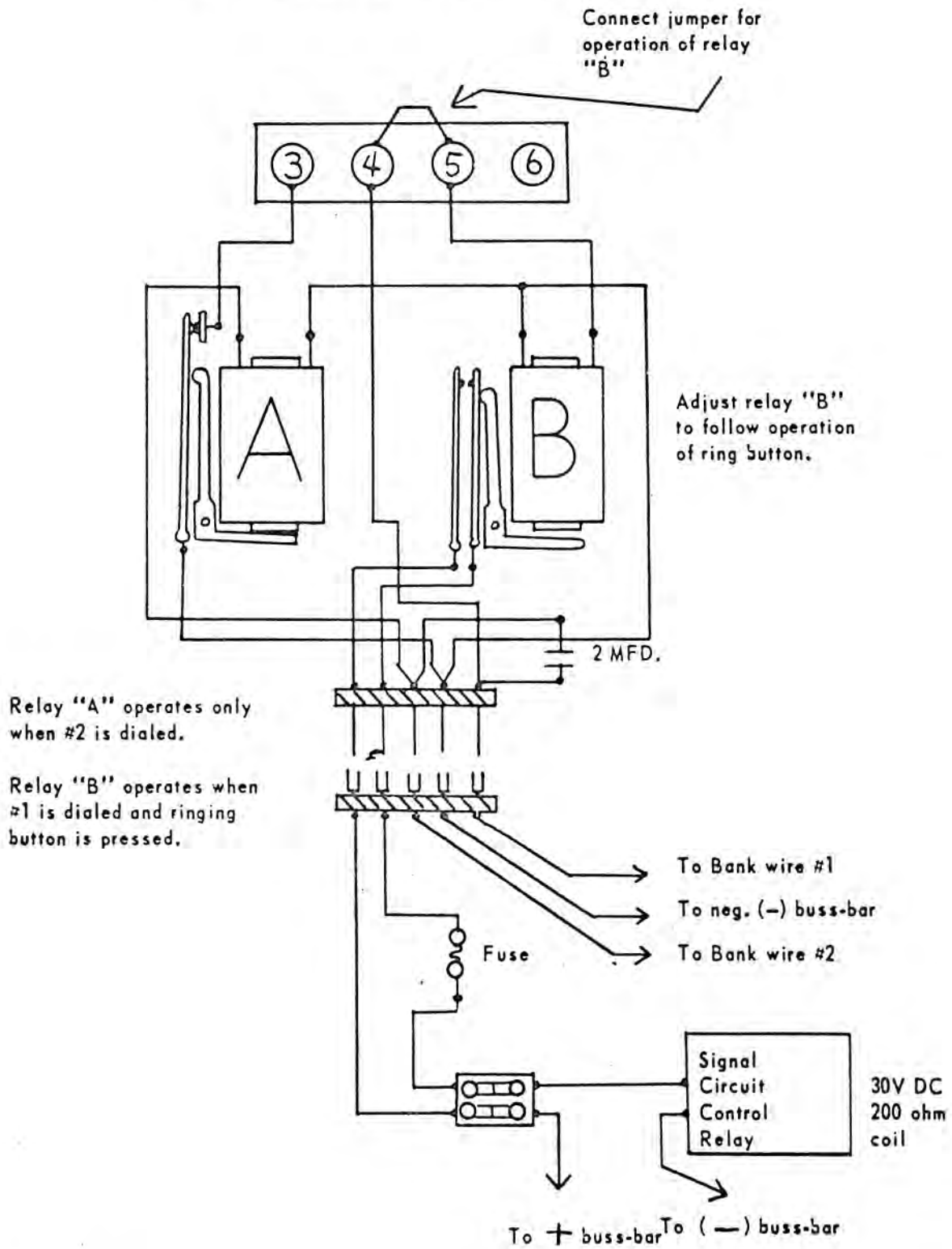
TELEPHONE SALES & SERVICE COMPANY
25 DEFOREST ST. AMITYVILLE, NEW YORK 11701

WIRING DIAGRAM FOR CONNECTING SELECT-O-PHONE GENERAL CALL VOICE PAGING SYSTEM



I-79 UNIVERSAL GENERAL CALL UNIT

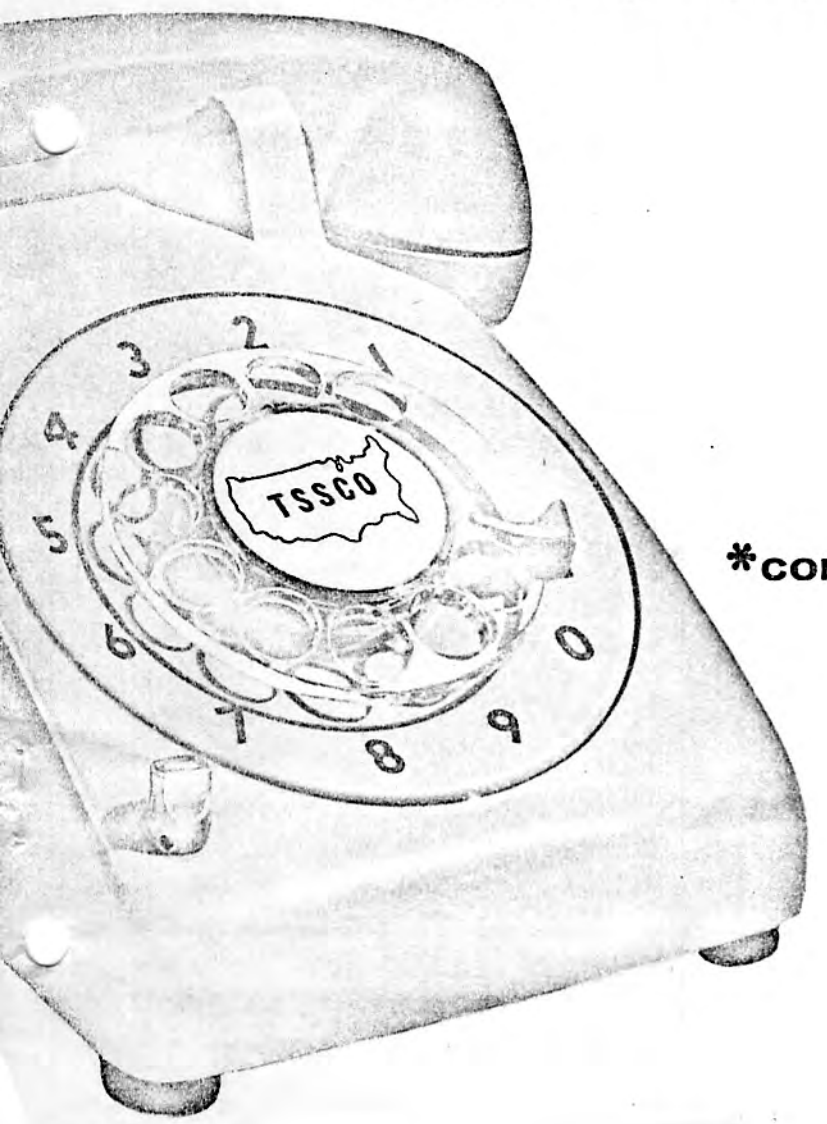
SHOWN CONNECTED FOR SIGNAL PAGING



If relay "B" will not follow operation of the ringing button of a telephone – remove jumper between 4 and 5 and install a resistor of approximately 25 ohms (10 watts) between 4 and 5.

KELLOGG

SELECT-O-PHONE*



*COPIED BY MANY EQUALLED BY NONE

Fully automatic Operation—Calls through quickly, at the flick of a dial. Select-O-Phone bypasses your switchboard, leaves it free for customers' and clients' calls.

Privacy — Select-O-Phone conversations are as confidential as face-to-face speech. All other lines are locked out from any line in use.

Unlimited Simultaneous Service—This exclusive Select-O-Phone feature permits unlimited numbers of simultaneous conversations. There are no busy signals unless specific station called is in use.

Conference Circuit — Every instrument in system can be connected in conference circuit. Any instrument can originate a conference. A **TSSCO exclusive**

Code Call — A Convenient Select-O-Phone feature for coded ringing. Called person answers on nearest station.

"Executive Right-of-Way"—Allows executive business to take precedence over a routine call. Any one or more stations may be equipped at no extra cost, to allow instant connection with any other station.

ONLY SELECT-O-PHONE OFFERS ALL THESE FEATURES

Select-O-Phone is the result of continuing research and development and pioneering of new ideas and equipment. It embodies the most advanced components and circuitry parts...to assure you of longer life and outstanding quality.

Provides small and medium size systems with equipment low in cost initially, and simple to maintain. No operator is required. Select-O-Phone is actually more economical than your city phone rentals. Select-O-Phone is easy to install, compact switching and power units take little space.

Select-O-Phone has been designed so that it can be maintained by people with no knowledge of telephone circuitry. Elimination of complicated "common circuits" makes it possible for each station to be controlled by only an individual selector. Removal of two screws enables one to remove selector from switchboard for adjusting or replacing.

AVAILABLE IN DESK AND WALL STYLES

SELECT-O-PHONE ELIMINATES DELAYS & WASTED MOTION

Party Lines — Your Select-O-Phone system's station capacity can be doubled by connecting extension instruments to any or all lines.

Voice Call — An exclusive Kellogg feature. Amplified speaker can be connected to any station servicing a number of people. The party wanted is identified by name and only he answers.

Fire Alarm — General call provides quick means of broadcasting fire alarm or other emergency messages through plant.

Coordinating Facilities — Widespread facilities may be tied together making entire personnel body as available as nearest instrument.

100% Trunkage: You can have as many simultaneous calls as you have pairs of instruments—you never get a busy unless the station you call is busy.

Voice Paging: Multiplies the value of your PA system. Every telephone becomes a microphone simply by dialing a pre-determined number. Enables you to locate any individual from any place in plant.

Most modern high quality telephones

Telephones by ITT Telecommunications suppliers of telephone instruments to telephone companies throughout the world. Long trouble-free life with attendant low maintenance costs is assured by time-proven design, high quality materials, and fine workmanship. Each part is manufactured from material selected as most suitable for its purpose. Each component is designed to assure its continued satisfactory performance under normal and adverse conditions. These and countless other reasons, make ITT telephones the phones you install and forget.

Your own private intercommunication system

Consider how much time (money) you can save when every key person in your organization can speak to everyone else, in seconds. When outside calls get automatic priority over routine business. When ideas and information can flow as quickly and freely as in face-to-face conversation—and just as privately. When you can call a conference in seconds—and no one leaves his desk. When fumble-and-fuss and walk-and-wait are replaced by instant, dial-quick intercommunication. With a Select-O-Phone System you get all this and more.

Select-O-Phone is the private internal intercommunication system designed to relieve your switchboard of jams and overloads. It handles all internal calls without going through the switchboard. These calls represent over 50% of a typical switchboard's overload, and are the most frequent cause of delays and busy signals. Outside calls get automatic priority because you know instantly when there is a call demanding attention. Inside calls get through instantly. You will like Select-O-Phone and so will your customers—as irritating delays vanish in new and faster service.

The cost?—Actually there is none. Select-O-Phone doesn't cost—it saves. Usually your present rental charges for "city" phone extensions that are no longer needed with Select-O-Phone internal service will more than pay the low purchase price in a few months and save you money ever after! As many of 40% of city phone extensions have been eliminated when Select-O-Phone is installed.

Feature by feature, Select-O-Phone is designed by telephone engineers to bring new communication speed and ease to any business requiring from 2 to 55 lines.

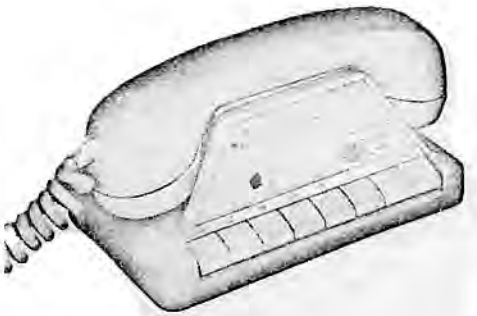
INSIST ON

ERSONALIZED

ONTROL

INGING

A TSSCO EXCLUSIVE



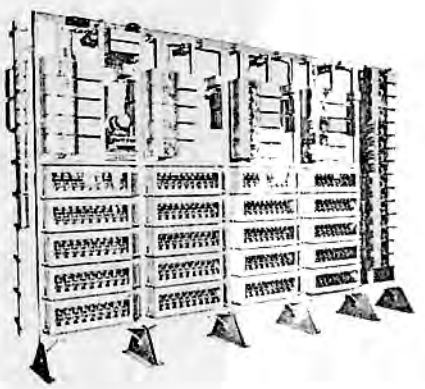
In addition to Select-O-Phone these include...

Direct-A-Call **2 to 9 stations**

Low cost, easily installed system with direct signaling, conference calls, talk back speaker, and voice paging (optional). Desk or wall mounting.

KMG 50, 100 lines and over

Automatic dial telephone system for dependable, high quality, low cost internal communication. Provides all standard intercommunication features plus simplified dialing, dial tone, busy tone, 2-wire circuit. Perfect for connecting widespread facilities.



Nation-Wide Dealer Organization

Exclusive, franchised dealers, located in all principal cities in the United States and Canada are experienced and trained in intercommunications. They are well qualified to help you in all stages of planning an internal communications system.

REGISTRATION-SERVICE WARRANTY

When your TSSCO Intercommunication System is installed, you can register the system with the factory. This is your assurance of proper maintenance and service as long as the equipment is in your possession.

HAVE YOUR NEEDS ANALYZED, FREE

You can do this best by calling your nearest TSSCO Communications Consultant. His knowledge and experience as a communications specialist will be of invaluable aid in planning and selecting the system best suited to your firm's specific intercommunication problem. He'll be pleased to give you a demonstration of Select-O-Phone in action. He works closely with the entire TSSCO engineering organization. This combined consultation service and a free analysis are yours for the asking, without obligation.

He will be able to help you lay out a versatile and efficient communications system to meet your present requirements, as well as keeping in mind your future needs that will result from growth and expansion.

PITE DIVISION

TELEPHONE SALES AND SERVICE CO.
25 DeFOREST ST. AMITYVILLE, N. Y. 11701