

# AT&T Standard Training Course

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Business Screening -  
Maintenance Administrator  
Handbook

Issue 1: March, 1982  
BTC No. 79  
Business Screening -  
Maintenance Administrator

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418-454

#### NOTICE

Not for use or disclosure outside the Bell  
System except under written agreement.

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South Central Bell Telephone Company  
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# BASIC TELEPHONE SYSTEMS

## Standard Telephone

The standard telephone is used by business customers with single-line service or it may be used in conjunction with complex telephone services.



The standard telephone can be in desk or wall models with rotary dial, TOUCH-TONE® dial or manual dialing arrangements. *Rotary Dial* telephones operate by sending a number of pulsing signals to electro-mechanical switching equipment equal to the digit spinned on the dial. These signals give an audible series of clicks. *TOUCH-TONE® Dial* telephones operate by transmitting a different signal to electronic switching equipment for each digit depressed and gives an audible series of different tones. The *Manual Dial* telephone is furnished for customers who want to restrict use of the telephone. It allows calls to be answered but prevents users from placing calls. They are used in stores, beauty shops, and other public places where management want to safeguard the placing of calls.

Telephones are normally equipped with dialing arrangements to utilize the switching apparatus in the central offices serving the area where the telephones are installed. Rotary Dials can be used in all service areas. TOUCH-TONE® Dials can be used depending on the switching equipment serving that location. Manual telephones cannot be installed on an exchange line unless that line also terminates in at least one rotary dial or TOUCH-TONE® dial telephone.

# Panel Telephone



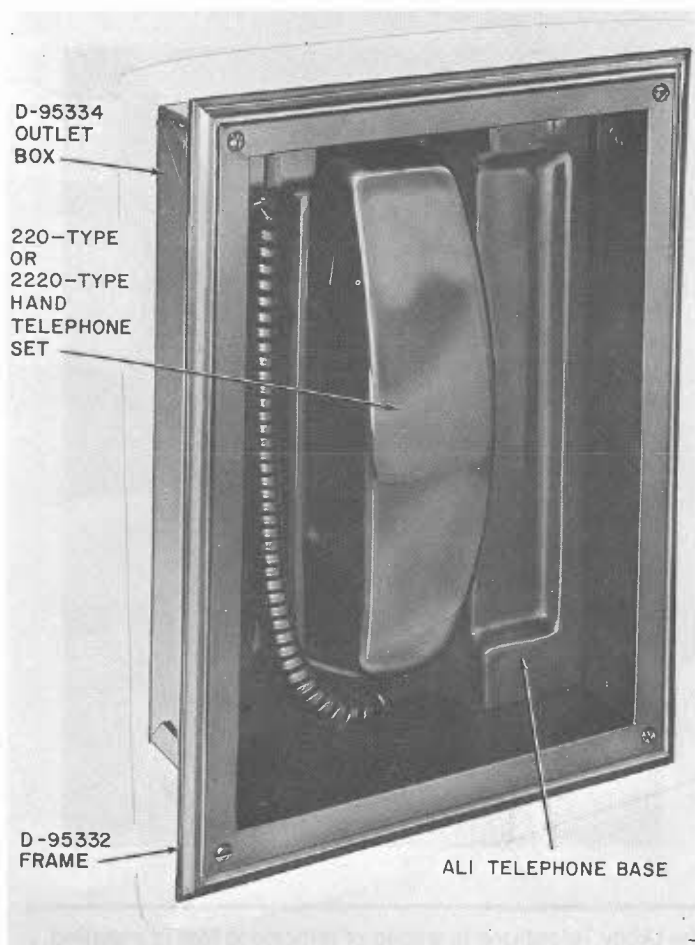
The Panel Telephone is a built-in telephone used primarily in apartment or hotel lobbies and in hospitals. There is no mounting cord and the receiver cord automatically reels back into the wall. It can be Rotary Dial or *Touch-Tone*® Dial and can be used with Central Office or PBX lines.

## Utility Telephone



The Utility Telephone is a style of telephone that is installed out-of-the-way on vertical surfaces. Normally it is located beneath a counter, at the side of a desk or table, or in narrow openings. Its accompanying ringer is mounted separately. It is used at sides of desks for convenience without using desk space, for bartenders underneath counter for easy access, on partitions separating order taker positions at wholesale dealers and beneath bank teller counters with the dial separately mounted on the countertop. The Utility Telephone may be rotary dial or *Touch-Tone*® and can be connected to only one line.

## Concealed Telephone



The Concealed Telephone is a flush-mounted, wall type dial telephone set installed in a concealed opening. This style telephone is primarily used in elevators to allow passengers to summon assistance but it may also be used in public areas such as lobbies of office buildings, in museums concealed behind cover for use by guards and in locked cabinets to restrict use at airline terminal gates.



# COMPLEX TELEPHONE SYSTEMS

While basic telephone systems are adequate for small-scale businesses, the larger business customer thrives on more complex telephone service to effectively operate. Complex services come in various size and feature packages. One of the main attractions of complex services is the multi-line capability.

Multi-line telephones are designed to permit several lines to terminate at each station. To provide effective line selection capabilities, various control and indicator features can be used to insure telephone service that is efficient and flexible in meeting the many specific needs of customers.

**Line Pickup Control**—enables the telephone user to select among several lines.

**Line Hold Control**—permits the user to hold a previously selected line while placing or answering a call on another line without causing a disconnect.

**Call Signal Lamping**—indicates an incoming call to be answered.

**Line Busy Lamping**—indicates what lines are in use.

**Station Busy Lamping**—indicates which associated stations are busy.

**Wink Hold Lamping**—indicates a call on hold.

**Automatic Exclusion**—automatically insures privacy of conversation by excluding other telephones from the line.

**Common Ringing**—enables a single bell or audible signal to ring for all incoming calls on any terminating line.

**Intercom**—allows station users to communicate with each other without tying up outside lines.

Customers require telephone service to meet the needs of their business operations. The more complex the business, the more complex the telephone system.

The **KEY** telephone set meets the needs of most business customers, as it can terminate at Central Office lines, PBX station lines, Centrex lines, intercom lines and private lines. The key set can be described as any instrument or external key capable of picking up two or more lines (up to ten). The least Complex of the key telephone is the One-Button Telephone.

# One-Button Telephone



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The One-Button Telephone is an instrument similar to the Standard Telephone but with a built in turnbutton. The button is in the lower left corner of Rotary models and upper left of TOUCH-TONE models of the desk telephone and on the lower right side of both Rotary and TOUCH-TONE models of the wall telephone.

The button is designed primarily to permit the customer to select between two lines, but it does not have the capability of placing a call on hold. The button may be used for signaling; i.e., behind a sales counter so a clerk can answer both lines and signal the office that a call is for the manager.

It may also be used for manual exclusion. Manual exclusion is used to prevent other stations terminating on the same line from hearing or participating in a conversation. On most telephones, exclusion is controlled by a specially designed plunger-button built into the telephone but it can also be accomplished using the turnbutton on the One-Button Wall Telephone; i.e., a Pharmacist in a drugstore might use the turnbutton to exclude the extension telephone while discussing a patient's prescription.

The One-Button Telephone is also available in the Panel Telephone (Rotary Dial & TOUCH-TONE®) and the Princess® Telephone (Rotary Dial and TOUCH-TONE®).



## Six-Button Telephone



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The Six-Button Telephone is an instrument similar to the Standard Telephone but with a row of six built-in pushbuttons at the base of the instrument on both Rotary and TOUCH-TONE® models. These buttons are designed primarily to provide convenient multi-line service for up to five lines. Normally, the sixth button is used for hold.

The Six-Button Telephone is available in standard desk and wall sets, the Panel Phone, and Rotary and TOUCH-TONE® dials.

## Ten-Button Telephone



The Ten-Button Telephone is an instrument of modern design with a row of ten built-in buttons providing convenient service for up to nine lines at a single point. It is available in Rotary or TOUCH-TONE models and can provide convenient multi-line service.

## Externally Mounted Keys



Externally Mounted Keys is a variation of the Key set arrangement where the buttons for pickup and hold are mounted separately from the telephone instrument onto horizontal or vertical surfaces. The keys may be mounted on the top or side of a desk or table, or on the wall.



# CALL DIRECTORS®

The *Call Director*® is more complex than the key set in that it provides up to 18 or 30 lines and it permits features to be used in lieu of lines.

## 18-Button Call Director®



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The 18-Button Call Director® Telephone is an instrument with built-in push-buttons providing convenient service for up to 17 lines at a single point. It is available in Rotary and TOUCH-TONE® models. Various features can be provided by installing one or more special modules in place of the three six-button modules normally furnished.

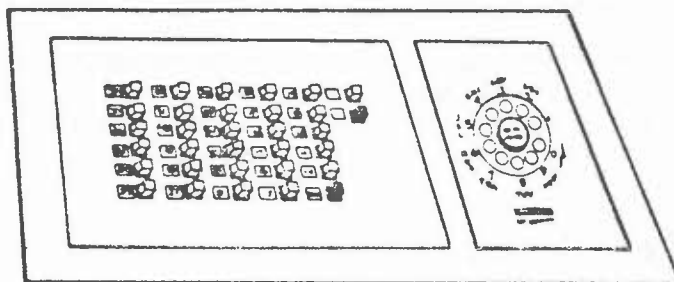
## 30-Button Call Director® Telephone



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A 30-Button CALL DIRECTOR® Telephone is an instrument with built-in pushbuttons providing convenient service for up to 20 lines at a single point. It is available in Rotary and TOUCH-TONE models. Various features can be provided by installing one or more special module arrangements in place of six button modules normally furnished.

## Flush Mounted Controls (400 Key Series)



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Flush Mounted Controls are units containing between 6 and 120 pushbuttons in a housing mounted flush into prepared openings in a horizontal or vertical surface. These controls can provide multi-line selection capacity for Basic Instruments but more frequently are used with a Composite Instrument to permit up to 119 lines to terminate at one location. Various features can be provided with special modules which replace the six-button modules normally furnished.

# AUTOMATIC DIALERS

There are some telephone services designed to meet special customer needs by adding to their convenience when placing calls. One of these services is automatic dialing devices.

Automatic Dialers are arranged to automatically dial any one of a predetermined and prearranged set of telephone numbers. They can be used to place local calls, long distance calls, and calls behind and through PBX equipment.

## Card Dialer



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The Card Dialer is a special telephone instrument that incorporates an automatic dialing device. The dial mechanism may be used as on a regular telephone, or numbers may be dialed using pre-punched plastic cards and depressing a button. Card Dialers are available in Basic and Six-Button models and with a Rotary Dial or TOUCH-TONE® Dial mechanism.

The cards may be used for dialing any type call — for PBX Station lines, local central office exchange calls, 1 + , 0+ long distance calls, WATS calls, etc.

A supply of 40 cards and 9 alphabetized separators are provided at the time of installation. Pockets in the housing of the instrument are used for storing these cards.

## Magicall\* Dialer



The Magicall Dialer is a separately installed device which can be used with any dialable telephone station. It consists of a dial-in unit, dialer unit and power supply and can store up to 1,000 numbers on magnetic tape for automatic dialing.

The dial-in unit is portable and is used only when adding or changing numbers in the dialer unit. The dialer unit moves tape forward and backward until the selected number is in the proper place.

The dialer unit should be located at least two feet from electric typewriters, or other motorized devices with magnetic field that may interfere with automatic dialing.

\*Registered trademark of DASA Corporation.

## THE CALL-A-MATIC® Dialer



The Call-a-Matic Dialer is an automatic dialing device which also contains a telephone. The Call-a-Matic can be used normally or frequently called numbers (up to 500) can be stored on magnetic tape.

This telephone is furnished only with the TOUCH-TONE® dialing mechanism, and it may be equipped with a built-in microphone for speakerphone operation.

# Touch-A-Matic® Telephone

## General Description



The latest addition to the Automatic Dialer family, The Touch-A-Matic® is also the first Bell System telephone to use a solid state memory. It may be provided with single or multi-line telephones. The Touch-A-Matic® 32 (shown above) has a thirty-one number dialing memory.

Adjacent to the thirty one memory buttons are the blank name-plates to identify the numbers to be recorded. The remaining button, the "Last Number Dialed" button accesses a "scratch pad" memory and when depressed automatically dials the last number dialed manually.

The RECORD button with associated lamp activates the memory circuits to store telephone numbers. The RECORD OFF button ends the recording operation.

The WAIT button, when momentarily depressed during recording operation, halts the automatic dialing sequence for PBX dial access codes.

For PBX and Centrex customers who must use dial access codes, a DIAL TONE DETECTOR may be provided. The function of the DIAL TONE DETECTOR is to recognize precise dial tone. When precise dial tone is heard, the equipment restarts the dialing. Precise dial tone is not available in Central Offices without TOUCH-TONE service nor with Step PBX Systems. (701, 740, 711)

When a customer has a speakerphone with DIAL TONE DETECTION, the desired repertory button can be depressed and the speakerphone is automatically turned on; the DIAL TONE DETECTOR responds to dial tone or tones and the number stored in memory is automatically dialed.

Other versions of the TOUCH-A-MATIC® are available. The TOUCH-A-MATIC® (TAM) 12 (the smallest version) is an adjunct dialer for single-line, modular, TOUCH-TONE® desk telephones. Although it is primarily intended for use with residential telephones, it can also be used with single-line business modular desk telephones that are not behind Key or PBX systems. The TOUCH-A-MATIC® 16 is a single line automatic dialer that provides Rotary or TOUCH-TONE® dialing. The TOUCH-A-MATIC® 32 ADJUNCT DIALER is for use with COMKEYS, Electronic Key Telephones, large Key systems and may even be used to provide an expanded memory for the TOUCH-A-MATIC® 32.





# Transaction® Telephone



The Transaction® telephone is designed to automatically dial the telephone number of a credit center or other data center and to read magnetically encoded cards. It will also store information from the card reader or the manual entry pad for transmission to the data center.

While the telephone network is making the connection, data can be manually entered from the manual entry pad to complete the information data centers need. The Transaction® telephone stores the input and sends it after receiving a special signal from the data center.

Customers use the Transaction® telephone to pay bills, charge purchases and to transfer money into bank accounts.

# AUTOMATIC ANSWERING SETS

## Code-A-Phone®



A Code-A-Phone® automatically answers incoming telephone calls, presents a pre-recorded message to the caller, records the caller's message and disconnects.

### General Description

The Function Selector is used to select the desired mode. If you wish to have calls answered and give the caller an opportunity to leave a message the Function Selector is turned to *ANS REC*. If an answer only is desired, then it's turned to *ANS ONLY*. The Function Selector is also used to select the *ANN REC* mode enabling you to record an answer message, *ANN CHECK*, to check the recorded message, *ERASE* to clear the tape, and *PLAY* to listen to recorded message.

## Automatic® Telephone

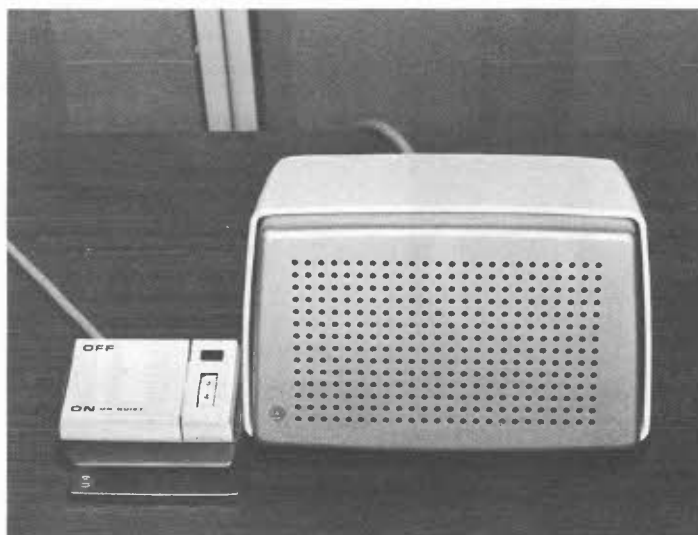


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*Automatic Telephones* come in two basic models. One has a dial and one does not. Both Models automatically answer calls with pre-recorded messages and then record any message that the caller wishes to leave.

The *Pocket Coder* is an optional feature of the Automatic Telephone. This device allows the customer to call his Automatic Telephone from another telephone and hear messages that have been left. The messages can then be erased remotely, using the Pocket Coder.

## SPEAKERPHONE 4A®



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The 4A Speakerphone® is a hands-free voice switching system for use as a telephone adjunct. The 4A Speakerphone consists of a transmitter and loudspeaker set and permits the user to talk and listen without holding the handset. Speakerphones can be added to Basic or Multi-line telephones and are used with any line terminating at a Station. It permits normal use of the telephone set for originating, receiving, or transferring calls instead of the Speakerphone when desired.

## INTERCOMS

Interoffice Communications Systems or "Intercoms" provide one or more internal talking paths used to place calls between stations in the same offices or between locations on a customer's premise. They allow station users to communicate with each other without tying up outside lines.

Generally interoffice calls can be placed through a switchboard, if the customer is equipped with one but this method is often inefficient for frequent communications among certain stations. Intercoms can be arranged for use on regular Key or Non-Key telephone Stations. Where Key sets are used, a line pickup button is required at each station for each intercom system termination.

Various intercom arrangements can also be used where there is no switchboard or Key equipment, such as in a home or small office. One arrangement is shown below.

### Basic Telephone Set With Buzzer



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The Buzzer is a manual type of intercommunication between two or more stations and affords no privacy. All stations including the called party can pick up on the conversation. This method becomes less effective as the number of stations increase.

# COMKEY SYSTEMS

The ComKey System is an advanced concept in combined telephone and intercommunication services. Comkeys are primarily designed for small and medium-sized business customers who want or need Key system and PBX type features in a system that would be economically priced and require a minimum of space.

To meet the business customer's need for more deluxe features, several ComKey System packages were introduced.

416 Com Key	734 Com Key	2152 Com Key
718 Com Key	1434 Com Key	

Common basic features of the Com Key Systems are:

- Com Key systems are designed to be a “*squared*” offering, that is, all stations should have access to all CO and intercom lines and that the lines will appear in the same sequence on all stations.
- *Pickup, Hold and Illumination* — any station can pick up any idle line or place any line on hold, and the lamps associated with the line buttons allow any station user to readily determine the status of each line.
- *Intercom* — any station can select an idle intercom line to call another station. There is no privacy, any station may enter into an existing call.
- *Tone and Voice Signaling* — the calling station may voice-signal the called party by tone rather than conventional ringer.
- *Recall* — used to drop a line in order to receive a second dial tone without going back on-hook.
- *Multiline Conferencing* — two or more lines may be conferenced by simultaneously depressing the line buttons of the lines to be conferenced.
- *Automatic Button Restoration* — returns a depressed line or intercom button to the unoperated position when the handset is replaced on the set.

Optional features are available for those customers whose needs become more sophisticated.

# COM KEY 416

The Com Key 416 has been specifically designed to service the small business market. The system has a capacity of four central office lines, sixteen stations, and two intercom lines. Additional central office lines can be provided on a non-common basis at selected telephones.

Four types of telephone sets, Common Equipment Stations, Basic Stations, Hands Free Answer on Intercom Stations, and Speakerphone Stations, are used with the Com Key 416.

1. **Common Equipment Stations**

Each Common Equipment Station contains the equipment circuitry for two Central Office/PBX lines, one intercom line, and power to operate seven Basic Stations. Two Common Equipment Stations hold the system at capacity. Common Equipment Stations cannot provide Hands Free Answer on Intercom or Speakerphone service (either built-in or 4A). (See illustration on page 28).

2. **Basic Stations**

Basic Stations operate the same as Common Equipment Stations. Since the Common Equipment Station contains the System circuitry, it has a larger base housing than the Basic Station set. (See illustration on page 29).

3. **Hands-Free-Answer-on-Intercom Stations**

This station provides all the basic features in addition to HFAI service. Parties converse with the HFAI Station on a push-to-talk basis using the DSS intercom button. HFAI Stations will hear a tone and can respond hands free. Light emitting diode (LED) indicators are provided to signify when the HFAI station's mike is active. "Mike Off" and "Do-Not-Disturb" features are also provided with HFAI service. The "Mike Off" feature disables the microphone but will permit a voice signal to reach the HFAI Station. "Do-Not-Disturb" disables the microphone and prohibits any station user from voice signaling the HFAI station. HFAI Stations are not able to originate calls on a hands free basis. (See illustration on page 30).



#### 4. **Speakerphone Station**

This station provides all the basic features in addition to built-in Speakerphone service. Speakerphone service is provided on intercom as well as Central Office lines.

A LED indicator is provided to signify when the Speakerphone microphone is active. "Mike Off" and "Off" features are also provided with the Speakerphone Station. When the "Mike Off" button is depressed, the microphone is deactivated. The "Mike Off" button is provided on a non-locking basis. The "Off" button is provided on a non-locking basis and is used to disconnect speakerphone calls. This button automatically activates the Automatic Button Restoration features at the conclusion of a call. (See illustration on page 29).

## **Common Equipment Station**





## Basic Station



## Speakerphone Station

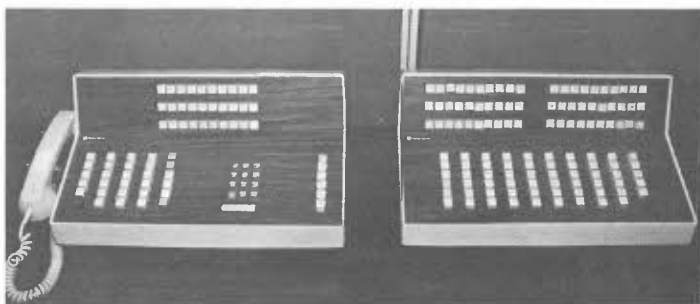


## Hands-Free-Answer-On-Intercom Station



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### Com Key\* 2152



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The Com Key 2152 is a new generation of Packaged Key Telephone Systems which is growable, flexible, and versatile. The Com Key 2152 provides a greater variety of optional features than is available with other Com Key packages.

This system can be installed on either a square or non-square basis, i.e., all lines do not have to appear at all stations. This will allow the use of personal lines.

The system is available with rotary dialing or optionally equipped for Touch-Tone calling. A system equipped for Touch-Tone service may utilize a mix of rotary or Touch-Tone station equipment.

## Com Key\* 718



The Com Key 718 is an advanced concept in combined telephone and intercommunication services. It is designed for customers looking for a system that works much like a switchboard. All lines ring at an attendant position so that all incoming calls are answered by one person and routed to the proper party. Every station has direct outward dialing, and, unlike a switchboard, every station can pick up and transfer calls on all lines. The system has a capacity of seven central office lines, eighteen stations and two intercom lines.

The 11- or 13-button telephones are specifically designed for Com Key 718. One station is designated as an "attendant" station. A common ringer is wired to this station, where all incoming calls would be answered and routed to the appropriate station user via the intercom during normal business hours. Calls can be originated and answered at any and all stations, and transfers can be handled by everyone.

## DIALOG\* INTERCOM SYSTEM

The DIALOG\* is a versatile, modular, fully electronic intercom system that transforms the basic business telephone into a complete and flexible communications system. With the new DIALOG intercom system electronic multiline intercom service and feature expansion can be added to an existing Key Telephone System, without equipment change-out. Station equipment includes six-button Key sets, attendant positions, and stations for users of special DIALOG features. The system is backed up by fully electronic, microprocessor based solid state engineered hardware.

The basic system provides the following features:

- *Intercom* — call progress tones such as dial tone, ringback, error tone, etc.
- *Repeated ringing*
- *Three-or four-party conferencing*
- *Do-not-disturb* — makes a line “busy to incoming calls.”
- *Call transfer*
- *Call add-on*
- *Station and Consultation Hold* — a station user can place another station on hold to dial a third station for consultation.
- *Two-link operation* (links are talking paths) — more than one station user can use the intercom at a time.
- *System busy indication* — when called station is busy on intercom, the calling station hears busy signal, but when called station is busy on CO/PBX call, the calling party hears audible ringback.
- *Privacy* — except when override is activated allows station users two-way private conversations.

- Single button appearance on key telephone sets.
- *Call forwarding* — calls intended for a user's station can be routed to an alternate station.
- *Override* — permits certain stations to bridge onto an established intercom connection or override do-not-disturb.
- *Remote Answer* — permits user at one station to intercept and answer a call intended for a second station.
- *Automatic Call-back* — enables a user who dials a busy station to program the system to call back when both stations are idle and a link is available.

Additional features can be supplied on an optional basis.

The DIALOG has a capacity of up to 4 separate talking paths (links) and 52 station codes. More than 52 stations can be installed by having stations share a code. Only two stations per code are permitted and only even numbered codes should be bridged. Up to eight CO/PBX calls can be answered, held, or transferred, but CO/PBX calls cannot be originated on the DIALOG.

Features are activated by specified system codes. Only one button is required on key telephone sets (Rotary or TOUCH-TONE® dial). Non-key sets can be used, but they will not supply those features involving the "hold" key.

## **ESS DIALING FEATURES**

The Electronic Switching System (ESS) is a stored program common control system that utilizes solid state and magnetic memory devices. It meets a wide range of business customer requirements by furnishing a wide range of service features that provide versatility and flexibility in telephone service and growth. Specific features can be offered to the customer on an optional basis or in packages, depending upon the customer's needs.

## **ESS Custom Calling Features (Memory Services)**

### **CALL FORWARDING**

#### **CALL FORWARDING INSTRUCTIONS**

YOU CAN HAVE ALL CALLS COMING INTO YOUR PHONE AUTOMATICALLY TRANSFER TO ANOTHER TELEPHONE NUMBER.

#### **TO ACTIVATE CALL FORWARDING**

1. WHEN YOU HEAR THE DIAL TONE, DIAL 72 TO ACTIVATE THE TRANSFER CODE. IF YOUR PHONE IS TOUCH-TONE AND EQUIPPED WITH A POUND SYMBOL (#) KEY, PRESS 72 AND THEN THE (#) KEY.
2. YOU'LL HEAR A SECOND DIAL TONE. DIAL THE NUMBER TO WHICH YOUR CALLS ARE TO BE TRANSFERRED.
3. YOU WILL HEAR TWO SHORT TONES, THEN THE NORMAL RINGING SIGNAL. WHEN YOUR PARTY ANSWERS, THE TRANSFER IS IN EFFECT. IF THE PARTY DOES NOT ANSWER, OR THE LINE IS BUSY, REPEAT THE ENTIRE PROCESS RIGHT AWAY. AN ANSWER IS NOT REQUIRED TO ACTIVATE THE TRANSFER THE SECOND TIME. THE TWO SHORT TONES YOU HEAR INDICATE THE TRANSFER IS IN EFFECT.

## **TO CANCEL CALL FORWARDING**

1. WHEN YOU HEAR THE DIAL TONE, DIAL 73 TO CANCEL THE TRANSFER CODE. IF YOUR PHONE IS TOUCH-TONE AND EQUIPPED WITH A POUND SYMBOL (#) KEY, PRESS 73 AND THE (#) KEY.
2. YOU WILL HEAR TWO SHORT TONES, INDICATING CANCELLATION OF CALL FORWARDING, ALL YOUR INCOMING CALLS WILL NOW RING ON YOUR PHONE AGAIN.

## **WHILE CALL FORWARDING IS IN EFFECT**

1. OUTGOING CALLS CAN STILL BE MADE FROM YOUR TELEPHONE.
2. ONE SHORT RING ON YOUR PHONE INDICATES AN INCOMING CALL IS BEING FORWARDED THROUGH IT TO ANOTHER PHONE.
3. WHEN THE TELEPHONE TO WHICH YOUR CALLS ARE BEING TRANSFERRED IS BUSY, INCOMING CALLS TO YOUR NUMBER ALSO WILL RECEIVE A BUSY SIGNAL.
4. CALL FORWARDING ARRANGEMENTS WILL REMAIN IN EFFECT UNTIL YOU CANCEL THEM.

## **THREE-WAY CALLING**

### **THREE-WAY CALLING INSTRUCTIONS**

YOU CAN ADD A THIRD PARTY TO YOUR TELEPHONE CONVERSATION. BOTH PARTIES MAY BE AT LONG DISTANCE POINTS, IF YOU WISH.

### **TO ADD A THIRD PARTY TO YOUR CONVERSATION**

1. PRESS THE SWITCHHOOK FIRMLY AND RELEASE ONCE. THE PARTY WITH WHOM YOU ARE TALKING WILL BE PLACED ON HOLD.
2. YOU WILL HEAR THREE SHORT TONES FOLLOWED BY A CONTINUOUS DIAL TONE. THEN DIAL THE PHONE NUMBER OF THE PERSON YOU WISH TO ADD TO THE CONVERSATION. (SPEED CALLING CAN BE USED.)

3. WHEN THE THIRD PERSON ANSWERS, YOU CAN TALK PRIVATELY. TO ESTABLISH THREE-WAY CONVERSATION, PRESS THE SWITCHHOOK AND RELEASE.

### **TO REMOVE THE THIRD PARTY**

(WHETHER OR NOT THE THIRD PARTY ANSWERED, DID NOT ANSWER, OR WAS BUSY.)

1. PRESS THE SWITCHHOOK FIRMLY AND RELEASE ONCE.
2. YOUR ORIGINAL CONNECTION IS RESTORED. IF DESIRED, YOU CAN ADD A NEW THIRD PARTY AS DESCRIBED ABOVE.

## **CALL WAITING**

### **CALL WAITING INSTRUCTIONS**

WHEN YOU'RE ON THE PHONE, YOU HEAR A SPECIAL PRIVATE TONE SIGNAL WHEN ANOTHER PARTY IS TRYING TO CALL YOU. YOU CAN HOLD—OR TERMINATE—THE FIRST CALL, THEN ANSWER THE SECOND. YOU CAN ALSO SWITCH BACK AND FORTH FROM ONE CALL TO THE OTHER. EACH CONVERSATION IS PRIVATE.

### **TO ANSWER A CALL WAITING SIGNAL**

1. PRESS THE SWITCHHOOK FIRMLY AND RELEASE ONCE; THE FIRST CALL IS PUT ON HOLD AND YOU'RE CONNECTED WITH THE SECOND CALL.
2. TO RESUME YOUR ORIGINAL CONVERSATION, PRESS THE SWITCHHOOK FIRMLY AND RELEASE ONCE. THE SECOND PARTY WILL BE PLACED ON HOLD, WHILE YOU'RE RECONNECTED WITH THE FIRST CALL.
3. YOU CAN SWITCH BACK AND FORTH FROM PARTY TO PARTY EACH TIME YOU PRESS THE SWITCHHOOK.
4. TO DISCONNECT BOTH PARTIES, HANG UP YOUR RECEIVER



## **SPEED CALLING**

YOU CAN REACH ANY OF 8 OR 30 FREQUENTLY CALLED NUMBERS (DEPENDING ON YOUR SERVICE SUBSCRIPTION) BY DIALING FEWER DIGITS.

### **TO PLACE A SPEED CALL**

WHEN YOU HEAR THE DIAL TONE, DIAL THE SPEED CALLING CODE (2-9 OR 20-49) ASSIGNED TO THE NUMBER YOU'RE CALLING. IF YOUR TELEPHONE IS TOUCH-TONE AND EQUIPPED WITH A POUND SYMBOL (#) KEY, PRESS THE CODE NUMBER AND THEN THE # KEY.

### **TO ADD OR CHANGE A SPEED CALL CODE NUMBER**

8-CODE SPEED CALLING:

- LISTEN FOR DIAL TONE, THEN DIAL ACTIVATING CODE 74, (ON A TOUCH-TONE PHONE EQUIPPED WITH A POUND SYMBOL (#) KEY, PRESS 74 AND THEN THE # KEY.)
- LISTEN FOR A SECOND DIAL TONE, THEN DIAL THE SPEED CALLING CODE NUMBER TO BE CHANGED OR ADDED.
- NEXT, DIAL THE LOCAL OR COMPLETE LONG DISTANCE NUMBER YOU WANT ASSIGNED TO THAT CODE NUMBER.
- TWO SHORT TONES INDICATE THE NEW CODE AND TELEPHONE NUMBER COMBINATION HAVE BEEN RECORDED.

30-CODE SPEED CALLING:

- FOLLOW ABOVE INSTRUCTIONS, EXCEPT DIAL ACTIVATING CODE 75 IN THE FIRST STEP.

## 101 ESS PBX System Features

1. **Add-On**—provides a means of adding a third party to an established incoming call (CO, Tie, FX, CCSA, etc.) without attendant assistance.
2. **Attendant Conference**—permits five conferees plus the attendant to be connected to the conference circuit at one time.
3. **Call Forwarding—Busy Line**—allows all direct inward-dialed (DID) calls to busy lines to be automatically transferred to the attendant.
4. **Call Forwarding—Don't Answer**—allows all direct inward-dialed calls encountering a don't answer condition to be automatically transferred to the attendant.
5. **Call Forwarding—Variable**—permits the station user to have his incoming calls transferred automatically to any station in the PBX or to the PBX attendant. The station user may activate the forwarding feature from his own station only. The attendant, however, may control call forwarding for all stations.
6. **Call Hold**—permits any call in progress to be “held” by dialing a code thus freeing the line for the purpose of originating another call.
7. **Call Pick-Up**—enables a station user to answer incoming calls directed to other stations in his pick-up group by dialing a code from his own telephone.
8. **Call Transfer—Individual**—This feature permits a station user to transfer a misdirected incoming trunk call (CO, Tie, FX, CCSA, etc.) or any incoming trunk call in progress, to another station without the assistance of the attendant. The incoming call can only be transferred to another CENTREX or PBX station or to the attendant.
9. **Call Transfer—Individual—All Calls**—This feature permits a station user to transfer a misdirected call or any call in progress without the assistance of the attendant. This is similar to the Call Transfer—Individual feature, but is arranged to transfer any call.
10. **Camp-on with Indication to Busy Station**—With this feature an incoming central office or FX call that the attendant attempts to complete to a busy station is normally held waiting (camped-on). When the called line becomes idle, the camped-on call is automatically connected and the called station rung.

11. **Code Calling** — This feature permits the station user to dial an access code and a called party code to activate a system of distinctively coded bells, gongs, lights or horns. The called party can in turn answer the calling party by dialing the proper answering code.
12. **Conference Calling** — This feature permits a station user to establish a conference with up to five (5) conferees plus the originator without the aid of the attendant.
13. **Consultation Hold** — This feature permits a station user to hold an existing incoming trunk call (CO, tie, FX, CCSA, etc.) and originate a call to another station for consultation and then return to and complete the original call.
14. **Consultation Hold—All Calls** — This feature permits a station user to hold an existing call while originating a new call for the purpose of consultation. After consultation, the initial call can be restored. This is similar to the Consultation Hold feature, but is arranged for operation with any established call.
15. **Hang-Up Interval** — When any PBX/CENTREX station user hangs up on a call, he must wait at least 1.6 seconds before originating a new call; otherwise, the equipment may recognize the off-hook condition as a flash.
16. **Immediate Ring** — In this system the called station is rung and audible ring is returned to the calling party as soon as the line is seized without waiting for the expiration of a silent interval.
17. **Loudspeaker Paging** — This feature permits the station user to connect to the customer's loudspeaker paging equipment by dialing an access code.
18. **Night Service** — Night service arrangements allow incoming attendant calls to be answered at preassigned stations during the attendant's absence.
19. **Power Failure Transfer** — In the event of a commercial power failure at the customer's location, this feature provides for the automatic connection of a certain prearranged station directly to the central office.
20. **Recorded Telephone Dictation** — The dial dictation circuit is used station users for dictating to and control of customer-owned dictating machine.
21. **Restrictions** — The station restriction is furnished in ALL PBX/CENTREX packages.

22. **Speed Calling** — This feature permits the station user to reach PBX/CENTREX or “outside” stations by dialing a two-digit access code followed by a two-digit speed code.
23. **Station Hunting** — Calls incoming to a station arranged for this feature are redirected to another predetermined station in the PBX whenever the called station is busy.
24. **Threeway Calling** — This feature provides a means of adding a third party to an established call without attendant assistance. This is similar to the Add-On feature, but it permits adding a third party to any established call.
25. **Touch-Tone Calling** — Any PBX/CENTREX station can be equipped with either a Touch-Tone or a rotary dial. Both may be bridged on the same line.
26. **Trunk Answer—Any Station** — This feature permits any station to answer a call to the attendant by dialing a special code when the night service feature is activated.

## Multibutton Electronic Telephone Sets

The Multibutton Electronic Telephone (MET) Sets are used with the HORIZON\* Communications System and the Electronic Custom Telephone System (ECTS). The MET sets have electronic tone signals instead of a bell. Light emitting diodes on the sets automatically show what's happening in the system. The lights are located next to each button: green indicating what lines are busy, ringing or on hold, red showing which line you're connected to when making a call.



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Mets have 10 buttons — four with fixed uses: one for hold, one for transferring and conferencing calls without the aid of an attendant and two for system access to make or receive calls. The other six buttons serve any of the features available to the system in service.

Some of the features available on a MET set are:

- Call Forwarding-All Calls
- Calls Waiting
- Station Busy Indication
- Station Message Waiting
- Manual Exclusion
- Recall Button
- In Use Indication
- Line Status Indication
- Automatic Intercom
- Manual Signaling
- Pre-Selection

Many other features are provided in MET sets depending on which system is in service.

# HORIZON® COMMUNICATIONS SYSTEM

The HORIZON® Communication System is a microprocessor based system utilizing stored program control and a combination of modern Multibutton Electronic Telephone (MET) sets and single-line TOUCH-TONE® sets. It was designed to serve customers with up to 79 stations that incorporates all the functions of Key Telephone Systems with custom calling features normally associated with PBX/Centrex services.

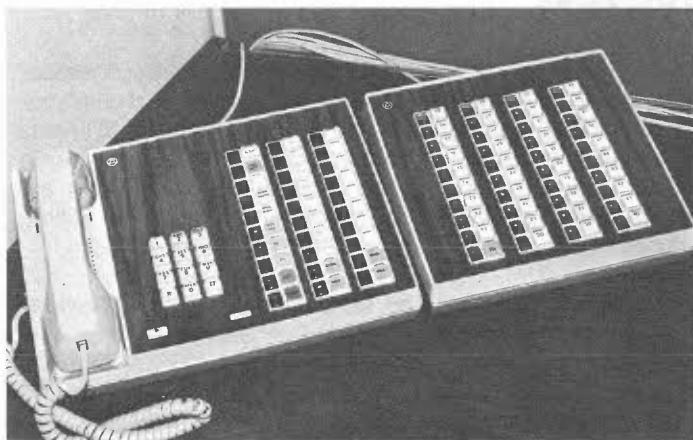
The HORIZON® System can be changed by the *Telephone Company technician* using a portable Service Access Unit (SAU). This unit can add, change, rearrange or delete features on each telephone, reassign existing phones *with* wiring changes, and change the number of extensions.

The Customer Access Unit (CAU), an optional feature, enables the *subscriber* to reconfigure features of the system; thereby providing minimum descriptions and maximum savings to the customer. With the CAU the customer can add, change, rearrange or delete features on each telephone, reassign existing telephones *without* wiring changes, and change extension numbers. The CAU does not allow the customer to alter system and line translations which must be performed by a telephone technician.

The HORIZON® System executes on-line maintenance routines automatically. During normal system operation, Light Emitting Diodes (LED) provide trouble indications at the attendants console.



## Horizon® Features





# System Features

## Abbreviated Ring

An incoming call to a busy station will provide only one ring to that station. The calling party hears normal ringing.

## Dial Dictation Access

This feature permits access to and control of dictating equipment by station users within the system. Dictation trunks are treated as pooled facilities which may be accessed by a dial code or by a pooled facility access button. Control of the dictating equipment is via the user's Touch-Tone telephone making the service inaccessible to toll-restricted stations.

## Distinctive Permanent Signal Treatment

When a user leaves the handset off the telephone on an internal line without a talking connection, the system will automatically disconnect from the line after approximately 10 seconds.

## External Alert Access

This feature provides the control signals necessary to use customer provided external alerts such as bells, horns, and lights in addition to the station ringer for call alerting.

## Hold and Conference Release on Abandon

If an outside party hangs up on a held call, the HORIZON System will automatically release the held line.

## Immediate Ringing

On 10-button sets, the called party hears ringing within one second after the caller has finished dialing their number.

## Intercept Treatment With Reorder Tone

The following call attempts will give the caller a reorder (fast busy) tone:

1. Dialing an unassigned station number or pooled facilities access code. (9, 100-109)
2. Dialing a pooled facilities code when all lines in that pool are being used.
3. Dialing a restricted call.

### **Loudspeaker Paging Access**

This feature provides station users with two-digit dial access to a customer provided paging system. The attendant can have button access to the paging system via the attendant console. Up to three paging zones plus an all-zone capability can be provided. Each zone is accessed via a two-digit code. Customer provided background music can be piped through the paging system.

### **Multilink Intercome With Privacy**

The HORIZON System has the capability for establishing 24 simultaneous calls both internal and external to the system. Privacy is automatically provided on all station-to-station calls.

### **Music-On-Hold Access**

This feature provides customer-finished music to outside parties placed on HOLD. This feature does not work on conference calls being held or station-to-station calls.

### **Off-Premises Stations**

This feature allows HORIZON CS telephones to be located on different premises from HORIZON equipment cabinet.

### **Pooled Facilities—Dial Access**

HORIZON station users can, by dialing the appropriate access codes (9 or 100-109), be connected to an idle line belonging to a common pool of outside lines.

### **Power Failure Transfer**

During commercial power failures certain stations can be automatically connected to outside lines, on a one-to-one basis. Any station arranged for this feature must have an externally mounted ringer near the station. The HORIZON System memory will be maintained for four days by a backup battery so that the system will be fully operational when power returns.

### **System Alarm Indication**

The green lamp next to the ALRM button on the CAP, will light steadily whenever a trouble condition exists in the HORIZON system.

## **Through Dialing**

An outside line may be transferred by the attendant or any 10-button station user to another station, allowing the other station to dial out. This feature allows a restricted station to be given outside dialing when required. It will not work, however, on a toll restricted station.

## **Tie Lines**

This feature provides access to distant location via tie lines. Tie lines may be treated as pooled facilities terminated on the CAP with dial or button access from any station, or they may be treated as individual personal lines dedicated to those stations having a corresponding button appearance.

## **Two-Digit Station Dialing**

All stations (including attendants) and paging zones are assigned any station number between 11 and 89.

# **Station Features**

The following is a description of the *HORIZON* System station features. Custom features are identified by an asterisk (\*); all other features are standard.

This information is provided as a reference for the attendant when assisting station users.

Users questioning how to use any feature should be referred to their HORIZON CS Telephone User Card.

## **AUTOMATIC INTERCOM WITH STATION BUSY INDICATION\***

The AUTOICOM button allows a station user to call a particular 10-button telephone with a single press of the button. The called person received the call on a AUTO ICOM button and, therefore, knows who is calling.

Automatic Intercom calls are not covered by the Call Coverage feature.

The green lamp next to the AUTO ICOM button provides a station busy indication. Whenever the other person is busy on the telephone, the green lamp lights steadily.

The Automatic Intercom feature is similar to the Direct Station Selection (DSS) feature. However, DSS calls are received on a System Access (yellow) button and are eligible for the Call Coverage feature.

## **Call Coverage—General\***

This feature enables station users to have their calls answered by someone else when they are away from their desk or busy on another call.

Call Coverage is provided on a group basis. Station users can be senders—have their calls answered by someone else; or they can be receivers—answer calls for others. Those who answer calls for others have a COVR button on their 10-button telephone. The green lamp next to the COVR button flashes when there is an incoming call. The number on the button, under COVR, is the Call Coverage Group.

On incoming calls, the green lamp on the sender station will flush to indicate which line has the incoming call. The user may enter the connection at any time even though it has been answered by the COVR station.

Automatic intercom calls are not covered by this feature.

## **Call Coverage—Send Ring On Busy\***

Any station may elect to have this feature. Calls directed to a station, while that station is busy on another line, will start ringing at predetermined COVR stations after a single ring at the called station.

## **CALL COVERAGE—SEND RING ON DON'T ANSWER\***

Any station may elect to have this feature. Calls directed to the station and left unanswered for typically 1 to 5 rings will start ringing at predetermined COVR stations.

## **CALL COVERAGE—SEND RING ALL CALLS\***

Any 10-button station may be equipped with a SEND ALL CALLS button to transfer audible ring to predetermined COVR stations. Depressing the SEND ALL CALLS button will activate this feature and light the button's green lamp. Once activated, the Call Coverage Send Ring All Calls feature will transfer ringing (with or without the option for a single ring at the called station) on any call eligible for call coverage treatment. The feature is deactivated by a second push of the SEND ALL CALLS button.

## **CALL WAITING INDICATION**

This feature allows a busy station user to be informed, by a single ring and flashing green lamp, of the arrival of a new call to the user's telephone. (The calling party hears the usual ringing).

The second call may be answered by terminating the first call or by putting the first call on HOLD and answering the second.

## **CONFERENCE CALLS**

By means of the PLUS/MINUS button, any 10-button station user may set up a conference call. The conference call may include the station user and up to 4 additional parties. A maximum of two outside lines may be part of the conference call. (Outside parties include Central Office lines and Tie lines.) Loudspeaker paging calls may not be conferenced.

A station user wishing to form a 3-way conference, puts the first party on HOLD and, via another idle line button, calls the third party. When that party answers, the user announces the conference. Then, by depressing the PLUS/MINUS button and the winking line button for the held call, all three parties can talk.

## **DIAL ACCESS TO ATTENDANT**

This feature allows any station user within the system to reach the attendant by dialing the single digit "0"

## **DIRECT STATION SELECTION (DSS)**

This feature allows a 10-button station user to call another particular 10-button station user by simply depressing the DSS button. The green lamp associated with the DSS button lets the user know if the other party is busy on the telephone. The called party receives the call on a yellow System Access button.

## **DISTINCTIVE RINGING**

Distinctive ringing allows a station user to distinguish between incoming calls. One tone is used as the signal for incoming calls extended by the attendant or on a personal outside line. A second higher frequency tone serves as the signal for station-to-station calls.

## **FACILITIES BUSY INDICATION**

This feature keeps the 10-button station user informed of the availability of idle lines in any shared line group (OUT, WATS, TIE LINE). The green lamp associated with the line access button will be lighted steadily whenever all of the lines within the group are busy.

## **HOLD**

This feature allows a 10-button station user to hold a call by depressing the HOLD button. The user may subsequently replace the handset without losing the call or place a call on another line. To return to the held call, the user simply depresses the button next to the winking green lamp.

## **I-USE INDICATION (RED LAMP)**

Each line access button (SYSTEMS ACCESS, WATS, OUT, TIE LINE, PERSONAL LINE, AUTOMATIC INTERCOM, AND CALL COVERAGE) has an associated red lamp. When busy, this lamp lights steadily to indicate the line to which the station user is connected. When not busy, this lamp indicates the line to which the 10-button station would be connected upon lifting the handset.

## **LINE STATUS INDICATION (GREEN LAMP)**

Each line access button also has an associated green lamp. This lamp provides 10-button station users with information regarding the status of each line. The green lamp flashes during the ringing state, lights steady during the busy state and winks during the hold state.

## **MANUAL EXCLUSION\***

This feature allows a 10-button station user equipped with a MAN EXCL button to exclude the CAP and all other stations from an outside call by depressing the MAN EXCL button. It provides complete privacy on calls made or received on personal lines that are shared by others. This feature may be cancelled manually by a second depression of the MAN EXCL button or cancelled automatically by hanging up.

The green lamp associated with the MAN EXCL button remains lighted steadily while the feature is activated.

## **MANUAL SIGNALING\***

This feature is a prearranged signal to another telephone. Pressing the MAN SIGNL button causes a tone to be heard at both telephones. This feature can be activated at any time, even while talking on the telephone.

## **MESSAGE WAITING\***

With this feature, a 10-button station user can light a green message waiting lamp at another predesignated 10-button telephone simply by depressing the MSG WAIT button.

Either of the two users can light or extinguish the green lamp.

This feature could be assigned in conjunction with the Call Coverage features so that the person answering the call could leave an indication at the called station that a call had been received.

This Station Message Waiting is in addition to the message waiting capability available via the attendant console.



## **OUTWARD RESTRICTION**

Any station may be so arranged that it is denied dial access to some or all outside lines. Two types of restriction may be provided: dial 9 to make outside calls or toll calls and dialing codes 100–109 to access special lines. Stations receive reorder tone when they dial a restricted access code.

## **PER CALL RINGER CUTOFF**

Ringling may be cancelled immediately on any ringing 10-button station by depressing any line button, the RECALL (R) button or the HOLD button.

## **RINGING LINE PREFERENCE\***

This feature automatically connects a 10-button station user to the line that is ringing once the handset is lifted. No button depression is necessary. If two or more lines are ringing simultaneously, the station user is connected to the first line to start ringing.

## **STATION CALL TRANSFER**

Any 10-button station user may transfer any call to any other station without the assistance of the attendant. To do this, the user sets up a three-way conference call, using the PLUS/MINUS button, and hangs up. This feature allows for private consultation before effecting the transfer.

## **STATION-TO-STATION CALLING**

This feature allows any station user to directly dial any other 2-digit station within the system without the assistance of the attendant.

## **TOLL RESTRICTION\***

A station user may be given access to outside lines for local calls but denied the ability to originate toll calls. This restriction applies to local lines only (Dial 9 and Personal Lines).

## **Tone Ringing**

All 10-button stations are equipped with tone ringers. The volume of the tone ringer can be adjusted by moving the volume control switch found on the left side of the telephone.

## **Personal Line Access\***

A Personal Line button gives a 10-button station user an outside line for both placing and receiving calls. People outside of the HORIZON System can call the station directly on

the Personal Line and the user does not have to dial "9" for outgoing calls.

Since a Personal Line may be shared by up to 8 telephones, one person should be identified as the principal user so that the Call Coverage feature can be utilized. In addition, only that person should be assigned Prime Line Preference for that line so that unnecessary interruptions are avoided.

### **Pooled Facilities—Button Access**

Any 10-button station user can be given button appearances for each type of outside line available in the HORIZON System. For example, an OUT 9 button provides the user with a direct line for making outside calls. They do not have to dial the access code "9". Similarly, if a company has special outside lines such as WATS or tie lines, they will be assigned special code numbers 100 through 109. An OUT button with a code number on it, for example 101, means the user does not have to dial the access code to reach that line.

If all outside lines or special lines (pooled facilities) are busy, the green lamp next to the access button will be lighted steadily.

### **PRESELECTION**

This feature allows the station user to override Prime Line Preference features on 10-button sets by manually selecting the desired line access button before lifting the handset.

### **PRIME LINE PREFERENCE\***

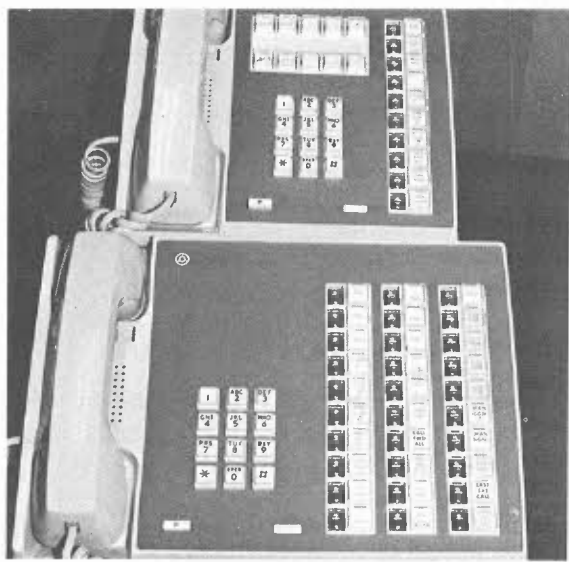
When the handset is lifted, this feature automatically connects a 10-button station user to the line designated as the prime (most frequently used) line. A station user may override this preference by preselecting another line or depressing the HOLD button prior to lifting the handset.

### **RECALL BUTTON**

The "R" button is standard on all 10-button station sets and on the CAP. By depressing this button, a user can obtain Recall Dial Tone from a Centrex or PBX system, or activate features in those systems. This eliminates the need for the user to depress the switchhook.



# ELECTRONIC CUSTOM TELEPHONE SERVICE



The Electronic Custom Telephone Service (ECTS) is a communication system which provides Key telephone features and simplified access to custom calling features through the use of Multibutton Electronic Telephone (MET) sets.

ECTS incorporates handsomely styled MET sets in 5, 10, 20 or 30 button combinations designed to work with the Dimension® PBX System. ECTS also provides a high degree of flexibility and feature capability under the stored program control of the Dimension® PBX.

With ECTS pre-assigned buttons on the MET set give immediate and direct access to all the special features, which eliminates the bother of learning numbers and codes.

## **Functions and Features**

- **Abbreviated Calling**
  - Station DDS
  - Last Extension Called
- **Custom Calling**
  - Automatic Callback
  - Call forwarding
  - Call Hold
  - Call Pickup
  - Call Waiting
  - Executive Override
  - Threeway Conference Transfer
  - Recall Button
- **Intercoms**
  - Dial Intercom
  - Automatic Intercom
  - Manual Intercom
  - Manual Signaling
- **Lights**
  - I-Use Indication
  - Line Status Indication
- **Line Access**
  - Personal CO Line
  - Bridged Call
  - Manual Exclusion
- **Line Holds**
  - Hold
  - I—Hold
  - Priority Hold
  - Exclusive Hold
- **Line Preference**
  - Prime Line-originating
  - Idle Line-originating
  - Last Line-originating
  - Ringing Line-terminating
  - Incoming Call-terminating
  - No Line-terminating
  - Preselection-terminating

- **Ringling**
  - Line Ringing
  - Common Audible Ringing
  - Abbreviated & Delayed Ringing
  - Ringling Transfer
  - Station Ringer Cutoff
- **Station Indications**
  - Station Busy Indication
  - Station Message Waiting

# THE INDUSTRIAL COMMUNICATIONS SYSTEM (ICS)

The Industrial Communications System (ICS) was designed to meet the total communications needs for underground mines. ICS is a complete voice communications system, linking the underground, surface, and public networks. The system allows emergencies to be handled in an orderly manner avoiding confusion that could jeopardize lives. ICS is available in either a basic or console configuration to meet the needs of the customer.

The basic system consists of new station sets for underground use coupled with above ground portal and line circuit cabinets. The console system provides conferencing and command post capabilities. ICS is modular and can grow to 30 lines and 90 stations as the need changes.

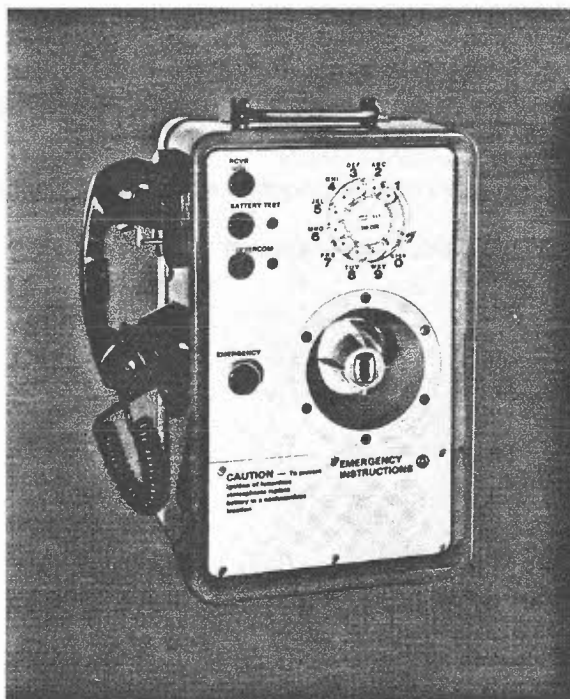
## BASIC SYSTEM FEATURES

- Private line service underground
  - Allows direct access to the surface for calling in production statistics, requesting supplies, discussing management-labor relations, or handling emergencies
- Access to the surface telephone network
  - Expedites spare parts ordering, troubleshooting, and crew reassignment
- Compatibility with existing facilities
  - Connects directly to existing PBX, key system, or central office
- Special alerting
  - Loudspeaker and optional strobe light alert personnel in noisy areas
- Emergency features
  - Line continuity check warns of severed cable. Emergency signaling provides communications while wearing smoke mask

## **CONSOLE SYSTEM FEATURES**

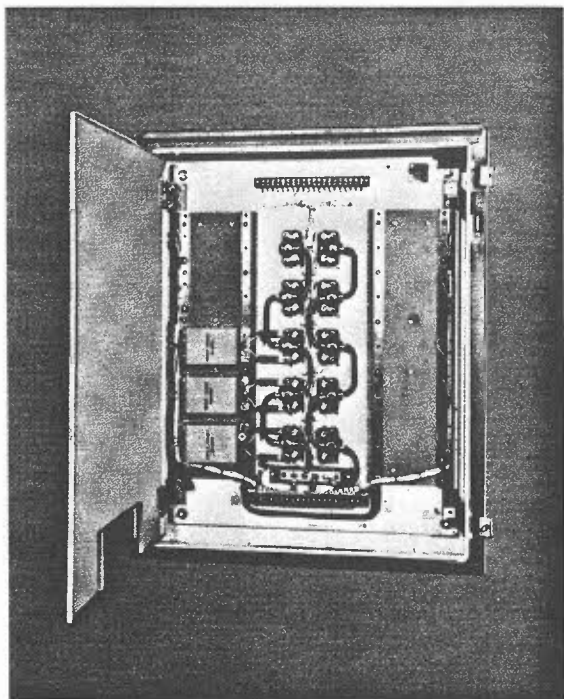
- **Selectable paging**  
Mobile personnel can be quickly located and re-assigned
- **Conferencing**  
Supervisors can monitor underground activity and include outside assistance into the conversation
- **Total communications control**  
Management can set priorities and supervise emergencies
- **Plus all the Basic System Features**

# Telephone Set



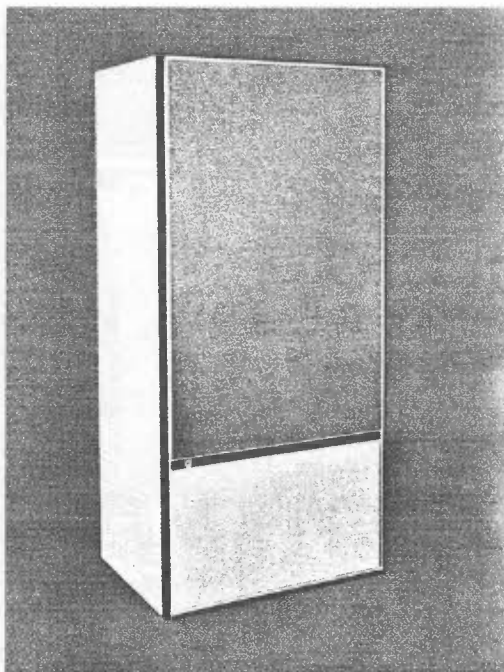
- Meets MSHA safety standards
- Rotary or TOUCH TONE® service
- Water and dust resistant
- Loudspeaker for signaling and paging
- RCVR VOL button provides increased receiver volume when needed
- BATTERY TEST button and LED provide GO-NO GO test of battery condition
- INTERCOM button provides communications to other sets without using surface facilities
- EMERGENCY button provides emergency signaling to above ground facilities
- Push-to-talk handset
- Sets can be located up to 10 miles underground

## PORTAL CABINET



- 
- Mounts at mine entrance
  - Weather resistant
  - Limits voltage and current levels entering the mine
  - Provides standard lightning protection on each line
  - Provides circuitry for up to 10 lines

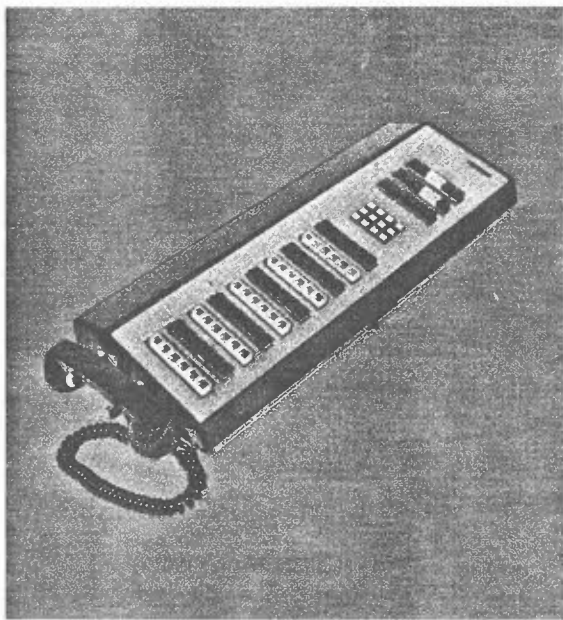
## ICS CABINET



- 
- Transmission and signaling interface between local switch and the mine telephone lines
  - Mounts line equipment, console interface, and alarm circuits
  - Provides system power
  - Modular - can grow to 30 lines
  - Located in customer office



# CONSOLE



- 
- Provides the capabilities for the attendant to:
    - set up conference calls
    - page underground personnel
    - monitor and override calls
    - receive emergency calls from telephone sets underground
    - seize any line in emergency
    - direct emergency operations
    - test console lamps
  - Provides visual and audible features
    - line status indicators
    - lamp test
    - loudspeaker with volume control
    - alert signals
    - push-to-talk handset/headset
    - rotary or pushbutton dialing



## PBX SERVICES

The Private Branch Exchange or PBX is a miniature Central Office in the customer's business, for interconnecting telephones within the business and providing switching among them. It switches inside calls from one station to another within the PBX and distributes incoming calls to the right stations. It is connected to the Central Office by trunks that allow the stations within a PBX to make and receive outside calls.

There are two basic kinds of PBX's:

- **Manual PBX** — All connections including station to station, outside calls and incoming calls are made by the switchboard attendant.
- **Dial PBX** — Dial tone is heard when a station user picks up the receiver of the telephone. Calls made from station to station and calls made going outside the PBX can be dialed by the station user. Calls coming into the PBX are answered by the switchboard attendant and connected to the called party.

A PBX can be one of the following:

- (1) A **main** PBX which has a directory number and can connect PBX stations to the DDD network for both incoming and outgoing calls. Tie trunks, FX trunks, and WATS trunks can also be terminated in a main PBX but the PBX does not switch tie trunks together in tandem.
- (2) A **satellite** PBX which does not have a directory number and whose incoming calls are routed from the main PBX via tie trunks. For outgoing service, calls may be routed directly over central office trunks, if provided, or over tie trunks through the main PBX and central office trunks. The satellite PBX is usually located in the same local area as its main PBX.
- (3) A **tandem** PBX which performs the same functions as a main PBX but is also used as an intermediate switching point to connect tie trunks to two or more main PBX's.

- (4) A **tributary** PBX which has tie trunks to a main or a tandem PBX and has inward and outward central office trunks and its own directory number.

The trunks and lines associated with a PBX are:

— **PBX Central Office Trunks** — which connect the PBX to the central office normally serving the PBX location. These trunks appear as station lines at the central office equipment.

— **PBX Foreign Exchange (FX) Trunks** — which are the same as PBX Central Office trunks except that they terminate in a remote exchange office rather than the one normally serving the PBX location.

— **PBX WATS Trunks** — which are similar to WATS lines except that they connect a PBX instead of a station set to a WATS central office. These trunks are used exclusively for outgoing calls from the PBX to the toll network.

— **PBX Station Lines** — (usually called PBX extensions) which connect the telephone stations, that are on the same premises as the PBX, to the PBX. The station lines can be connected through the PBX to other station lines, PBX tie trunks, C. O. trunks, FX trunks, or WATS trunks.

— **PBX Off-Premise Station Lines** — (usually called off-premise extensions) which give the same service as on-premise station lines except that the station equipment is located remotely from the PBX location. An off-premise station line connects an extension telephone station to a main station line.

PBX Service is available in several types and sizes, and feature packages.

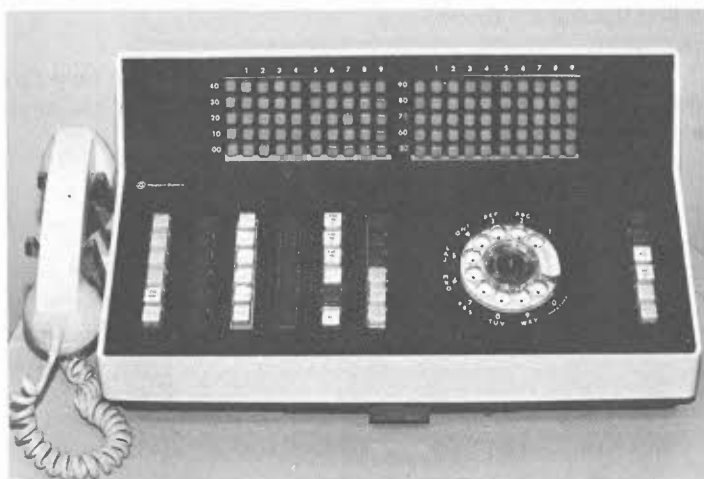
Type	Maximum Line Capacity
550 PBX	320
551 PBX	5000
558A PBX	40
700C PBX	1000
701A PBX	740
750A PBX	15
755A PBX	15,000
756A PBX	80
757 PBX	200
761 PBX	2,400
770A PBX	400
101 ESS	4,000
800A PBX	140
805A PBX	57
812A PBX	2,000

**Features** (Basic and Optional)

- Add on—permits station user to add another station in the system to incoming C.O. trunk call. (also FX and CCSA if facilities permit)
- Alternate Answering Positions—secondary answering position used in lieu of the primary position (both cannot be operated at the same time).
- Battery Reserve Power—provides an alternate source of power to operate the system for approximately 6-8 hours if commercial power fails.
- Busy Verification—allows the attendant to connect to apparently busy line and to determine if a station is actually in use.
- Call Announcing—(One-Way Splitting) gives the attendant the ability to announce a call to a called party without being heard by the calling party.
- Call Transfer—Attendant (Flashing Recall)—permits a station to signal the attendant by flashing the switchhook, then requesting the transfer of a call to another station.

- Call Transfer-Station—permits a station user to transfer incoming C.O. trunk calls without attendant assistance.
- Camp-On—permits the attendant to hold incoming call and camp-on a busy station call.
- Camp-On Indication—applies momentary burst of tone to camped on station to indicate a call is waiting.
- Conferencing-Attendant—enable attendant to establish and supervise conference calls with up to 5 stations.
- Conferencing-Station—enables station user to set up a conference with up to five other stations without attendant assistance.
- Consultation Hold—permits station user to hold incoming CO trunk call on a line, originate a call to another station in the system for consultation, then return to the first call.
- Dial Dictation—allows a station user voice or dial control of customer-owned dictation equipment.
- Direct Outward Dialing—allows non-restricted stations to access the CO trunk or miscellaneous trunks without attendant assistance.
- Direct Station Selection (DSS)-Attendant—permits the attendant to complete incoming calls to stations.
- Direct Station Selection-Station—allows a station user to select other stations in the system by depressing non-locking Key until dial tone is removed and the station rings.
- Intercept Facilities—directs calls made to unassigned station numbers, vacant levels, restricted codes, etc. to the attendant.
- Lockout and Secrecy—lockout restricts the attendant from re-entering a completed trunk connection once a call has been established unless the attendant is recalled by the station.
- Message Registers—records outgoing central office calls.
- Message Waiting—indicates that the attendant has message for a station user.

- Night Connections (Console)—permits the attendant to connect CO trunks on flexible or fixed basis to stations for after hours operation. (Flexible—attendant operates night Key on the console. Fixed—designated stations permanently wired to CO trunks (attendant operates night Key)
- Power Failure Transfer—automatically transfers designated CO trunks to selected stations if commercial power fails.
- Station Hunting—all or some station lines arranged to hunt an idle station line when the called line is busy.
- Station Restriction—stations are denied dial access from central office trunks and/or dial tie lines.
- Toll Diversion—prohibits a station user from making toll calls without attendant assistance.
- Trunk Answer from any Station—enables any station user to answer incoming trunk by dialing answering code and transferring the call to any other station using call transfer-individual feature.
- Two-Way Splitting—attendant may talk to either calling party or called party without the other being in on the conversation.



# PBX ALARM INDICATIONS

**Major Alarm** — an actual or impending trouble in the PBX requiring immediate corrective action in order to restore the PBX.

**COM** (Common Equipment) — Lights when a fuse is blown in the switching equipment or if a power failure has occurred.

**FA** (Fuse Alarm) — indicates a blown fuse in a PBX attendant position.

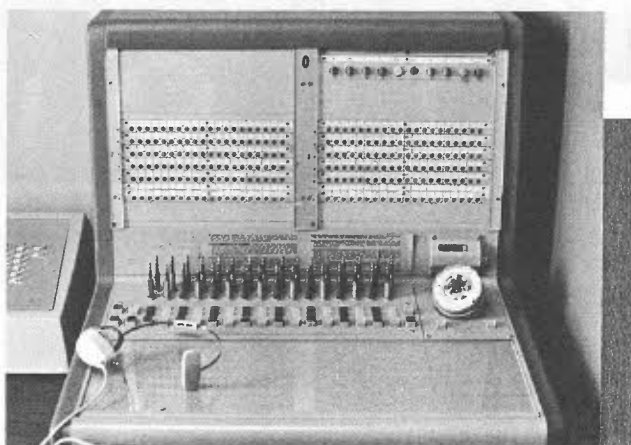
**CF** (Commercial Power Failure) — indicates a power supply alarm.

**Minor Alarm** — a trouble condition that has not degraded the PBX capability, but which should be corrected at the earliest feasible time.

**RM** (Release Magnate) — indicates that a switch has failed to restore to normal.

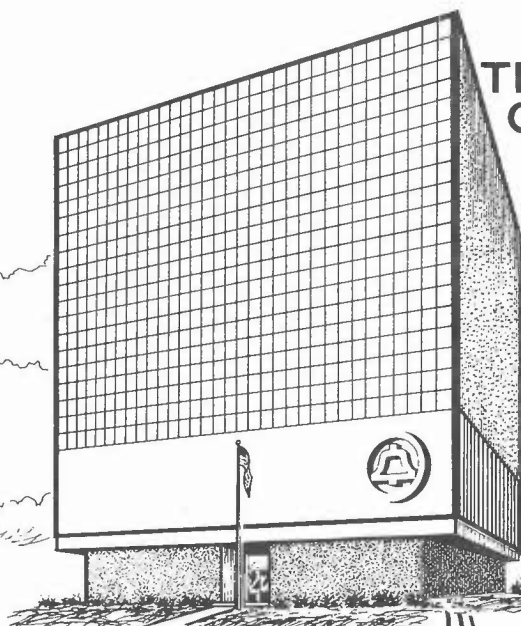
**PS** (Permanent Signal) — indicates a receiver off-hook or a line trouble condition.

**CB** (Call Back) — indicates a station user has failed to get a line finder because of an equipment failure or because all line finders are busy.

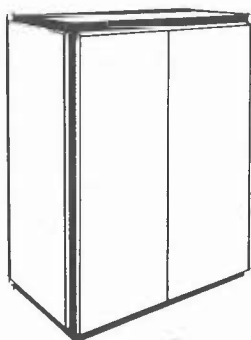




# TELEPHONE COMPANY



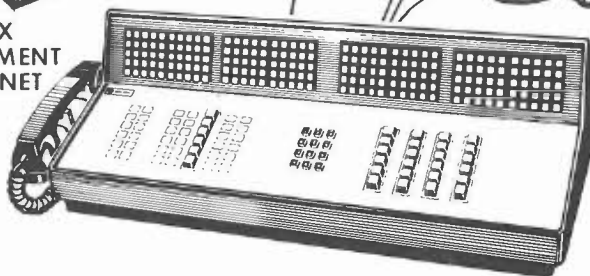
CENTRAL OFFICE LINES



PBX  
EQUIPMENT  
CABINET



STATION  
USERS



# **CENTREX SERVICES**

The Centrex is not different from the PBX in its basic operation, just in its added features. It really is a "super-PBX" having features not offered in a PBX.

The two major features of the Centrex are:

1. People outside the system can dial extensions directly, without going through the switchboard operator. Each extension has a 7-digit telephone number.
2. Each extension gets a separate bill, so that management knows who is charging calls, particularly long-distance calls.

## **CENTREX SERVICE**

Is divided into two classes: CTX-CO Line and CTX-CU Line.

### **CTX-CO Line**

The dial switching equipment is located in a building owned or leased by the Company and the attendant's positions are located on the subscriber's premises.

### **CTX-CU Line**

Provides a direct connection from a centrex unit located on the customer's premises to a station at the same location.

### **CTX-CU STATION LINE OFF PREMISES**

Provides a direct connection from a centrex unit located on the customer's premises to a station located on the customer's premises remote from the centrex unit location.

## **CENTREX STATION EQUIPMENT AND ATTENDANT EQUIPMENT**

### **CENTREX Station Telephones**

#### **FEATURES**

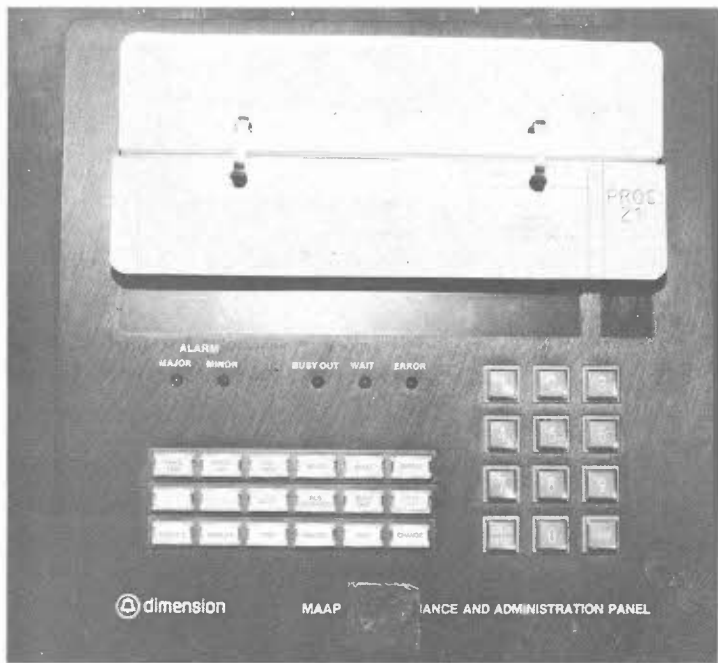
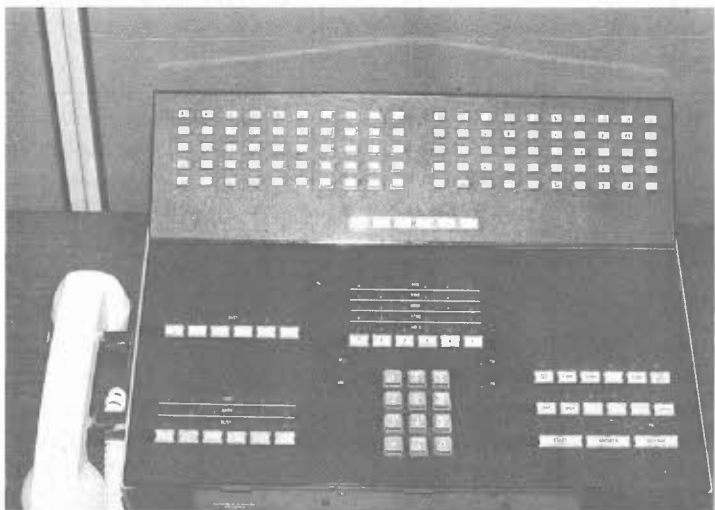
- A. Calling a Centrex Attendant (Dial 0)
- B. Recalling the Attendant (Flash the switchhook once)
- C. Calling another CENTREX Station in same customer group (Lift handset, dial tone, dial desired party)
- D. Calling a number outside the customer group (Dial 9 or WATS facility)
- E. Calling another CENTREX customer group or PBX via a tie trunk
- F. Calling outside number via FX trunk
- G. Calling an outside number via a tandem tie line
- H. Using the loudspeaker paging facility
- I. Using the Code Calling Facility
- J. Transferring an incoming call without attendant assistance
- K. Adding a third party to an established call
- L. Station dial conference (Conference Calling)
- M. Answering calls during a night service condition
- N. Answering calls for an unattended console (A trunk can answer any station)
- O. Speed calling
- P. Operation during a power failure at the console control cabinet
- Q. Operation when consoles are removed from service by diagnostic programs
- R. Gaining access to recorded telephone dictation
- S. Using the attendant-controlled conference feature
- T. Call forwarding
- U. Call forwarding—busy line
- V. Call forwarding—don't answer
- W. Call hold
- X. Call pick up
- Y. Call waiting

## **CENTREX Attendant Telephone Consoles**

### **FEATURES**

- A. Switched Loop Operation (gives attendant voice access to calls associated with the consoles)
- B. Two-way splitting (Enables an attendant to talk to either a calling or called party with the other party excluded from the conversation.)
- C. Night Service
- D. Attendant Dialing
- E. Position Busy (The console appears busy to all new incoming calls.)
- F. Attendant-controlled conference
- G. Attendant control of facilities (Enables an attendant to temporarily deny stations within CENTREX group access to selected facilities)
- H. Busy verification of lines
- I. Busy verification of tie trunks
- J. Attendant call thru tests on tie trunks
- K. Dial thru attendant
- L. Attendant camp-on

# DIMENSION® PBX SYSTEM



The DIMENSION® is a fully electronic communications system utilizing solid state circuitry with Stored Program Control. Inside the system is a miniaturized computer, which has a memory and is programmable for future uses as well as present ones. All of the features and options are programmed and stored on tape.

Associated with the Dimension® system is a Maintenance and Administration Panel (MAAP). This panel is used for isolating trouble conditions and updating the program tape for the Dimension®. By inputting various codes through the MAAP, the repair technicians can find out what the trouble is, the location of the trouble and what the corrective action should be.

The Dimension® system has a Customer Administration Panel (CAP) which is an attractive console base that is located in the customer's office. Through it, the customer can activate and de-activate various features of the system, modify calling privileges, rearrange and change a variety of functions as well as telephone numbers.



# **Description of Console Buttons and Lamps**

## **DSS (DIRECT STATION SELECTION) BUTTONS/BLF FIELD**

Used to complete calls to stations by pressing the correct hundreds group select button, plus the correct DSS button associated with a station line. Also, used to indicate the busy/idle condition of the station. If the station is busy or being rung, the lamp immediately to the left of the station number is lighted.

## **GROUP SELECT BUTTONS**

When more than 100 stations are provided, group select buttons are used to select a particular hundreds group. For example, when the hundreds group, select button is depressed, the busy/idle status of stations 100 to 199 is displayed. The group select button also assigns the direct station selection buttons to the same hundreds group. A hundreds group remains displayed, and the lamp over the group select button remains lighted until another group select button is operated.

## **HANDSET/HEADSET JACK**

Two jacks are provided, one on each end of the console. Plugging in a handset/headset, switches power to the console for normal operation. When there is no handset/headset plugged in, power is removed and the console is inoperative.

## **TEST/REMINDER TONE SWITCH**

Allows the attendant to check the lamps on the face of the console, or disable the calls waiting and timed reminder audible signals. When operated in the momentary position, all console lamps with the exception of the alarm lamps are lighted, and the audible signal sounds. This condition continues until the switch is released. When operated in the locking position, calls waiting and timed reminder audible signals are disabled.

## **VOLUME CONTROL**

A variable turn-type volume control used to adjust the level of the audible signal at the console.

## **CUSTOMER INSTRUCTIONS STORAGE**

Used to store instructions for attendant.

### **HOLD LAMP**

Lights steadily on the associated loop when a station-to-attendant or attendant-to-station call has been held on the console, and flashes when station flashes attendant or for timed reminder on a held call.

### **ATND (ATTENDANT LAMP)**

Indicated that the attendant is connected to the associated loop, when steadily lighted, and that there is a call waiting to be answered when flashing.

### **BUSY LAMP**

Lights steadily on the associated loop when the called party is busy, and flashes for timed reminder on a call waiting call or attendant recall.

### **RING LAMP**

Lights readily on the associated loop when the called party is being rung, and flashed for timed reminder on a call waiting call, or attendant recall.

### **ANS (ANSWER) LOOP**

Indicates that the called party has answered or that the called trunk has been seized when steadily lighted and an attendant recall from a two-party hold call sequence when flashing.

### **LOOP BUTTONS**

Used to select the appropriate loop for processing or originating a call.

### **ALPHANUMERIC DISPLAY**

Provides up to 30 different 4-character messages to the attendant to identify the incoming call.

### **ICI (INCOMING CALL IDENTIFICATION) LAMPS**

Allows the attendant to identify the type of call directed to the console. Consist of six nonoperating buttons each with an indicator lamp.

### **AUD (AUDIBLE) OFF BUTTON**

The audible on/off button controls the audible signal at the attendant console. The associated lamp lights when the audible signal is turned off.



## **VERFY (VERIFY) BUTTON**

Allows the attendant to override a busy line to check whether or not the line is busy. (A tone is provided to the parties on the call to indicate the override condition.)

## **NIGHT BUTTON**

Used to activate or cancel night service. Existing calls are completed normally, and new incoming calls to the console are processed in the night mode when night service is activated.

## **POS BUSY (POSITION BUSY) BUTTON**

Busies out the attendant console and makes it unavailable to handle new incoming calls. Calls in progress and outgoing calls may be completed normally.

## **CLASS BUTTON**

On a dial 0 call, the calling number is displayed in the ICI field. This button also allows the attendant to check the class of service (level of restriction) of the calling station. Pressing the CLASS button repeatedly will alternately display the station number and the station restriction identification. The restriction identification is displayed as one of four restriction works "NON," "FULL," "TOLL," or "REST" or may optionally be a number 1 through 31. The number (locally defined) represents the total service, including restrictions, provided to the station.

## **PAGE BUTTON**

Operation of PAGE button allows the attendant access to loudspeaker paging equipment. Button must be held pressed for the duration of the page. PAGE lamp lights when page equipment is in use.

## **CANC (RLS PTY) BUTTON**

Releases the called party from the active loop. May also be used to release a tone or an outgoing trunk seized by the attendant. Used on attendant transfer to release the station that called the attendant.

## **SPLIT BUTTON**

The SPLIT button performs two functions. If the attendant is in a talking state with the calling party, operation of the SPLIT button temporarily removes the calling party from the connection. If the calling party has already been split from the

call by operation of either the START button or the SPLIT button, pressing the SPLIT button cancels the split and reconnects the calling party to the call if privacy is not provided. SPLIT lamp above button lights when split is in effect.

### **HOLD BUTTON**

Used to hold a call on the console, freeing the attendant to process other calls. HOLD lamp above the associated loop button lights. If lockout feature is provided, a completed 2-party call cannot be reentered unless the station user flashes to recall the attendant.

### **PA (POSITION AVAILABLE) LAMP**

Lights when the position is occupied and available to process new calls.

### **RELEASE BUTTON**

Releases the position from a call and makes the position available for another call.

### **ANSWER BUTTON**

Performs the same function as a loop button operation on a loop with a new call. The attendant is automatically connected to whichever loop contains the first incoming call.

### **START BUTTON**

Used to obtain dial tone.

### **CW (CALL WAITING) LAMP**

Lights when one or more calls are waiting to be switched to the attendant position. Flashes when more than three calls are waiting if established level of 1-9 is not administered in the system.

### **PR (PRIORITY) LAMP**

Lights when console is busy and a call from another attendant console is waiting.

### **DIAL**

The console is equipped with a 12-button TOUCH-TONE® dialing pad.

### **MN (MINOR ALARM) LAMP**

When lighted, the lamp indicates a minor alarm condition at the PBX. A minor alarm condition is a trouble condition that

has not significantly degraded the PBX service but which should be corrected at the earliest convenient time.

### **MJ (MAJOR ALARM) LAMP**

When lighted, the lamp indicates a major alarm condition at the PBX. A major alarm condition is an actual trouble in the PBX requiring immediate corrective action in order to restore or maintain maximum service.

### **DIRECT TRUNK GROUP SELECT BUTTONS**

When the attendant is active on a loop, an outgoing trunk can be selected directly by pressing the desired trunk group selection button, instead of pressing the START button and dialing the trunk group access code.

### **BUSY LAMP**

Lights when all the trunks in the trunk group are busy.

### **WARN (WARNING) LAMP**

Lights when only a small number of trunks in this trunk group are available. The "Turn On" number for the warning lamp is determined locally and can be any number between 1 and 7.

### **CONT (ATTENDANT CONTROL) LAMP**

Lights when the attendant has activated attendant control trunk group access for this trunk group.

## **Station Features**

The following operating instructions are for station features and do not apply to the attendant console. They are intended as reference only for the attendant when assisting a station user.

## **Automatic Callback-Calling**

Allows a station user calling a busy station to be automatically connected to the called station when both stations are idle at the same time. The activating station may be used to originate or receive other calls.

# Call Forwarding

## ALL CALLS

Allows the station user to forward incoming calls to another station or to the attendant. Outgoing calls may be normally made while call forwarding is in effect. The station user will not receive call waiting signals on forwarding calls. All incoming calls will be forwarded to another station or to the attendant.

## BUSY AND DON'T ANSWER

Allows the station user to forward incoming calls to another station or to the attendant if your station is busy or doesn't answer within \_\_\_\_\_ rings.

## DON'T ANSWER

Allows the station user to forward incoming calls to another station or to the attendant if your station doesn't answer within \_\_\_\_\_ rings.

# Call Hold

Provides the ability to hold incoming and outgoing calls and, if desired, use your telephone normally while call is being held.

# Call Park

This feature (by the use of idle paging zones and answer-back channels) provides a station user the ability to place a call on hold without tying up the holding line. The call is transferred to a vacant port and then can be picked up by any PBX station dialing the appropriate answer-back code and channel number.

# Call Pickup

Allows you to answer a ringing telephone in your pickup group.

# Call Waiting

## **ORIGINATING (CALL WAITING SIGNAL, TO SEND THREE BEEPS)**

Allows a station to place a call to a busy station and be held waiting while a tone signal is directed toward the busy station. Only the called station hears the call waiting tone.

## **TERMINATING (CALL WAITING SIGNAL, TO ANSWER)**

Advises you that another call is waiting when you are on your telephone.

The calling party hears a special ringing tone that indicates the call is in a waiting state, not a normal “don’t answer” condition. You are alerted to the nature of the call by listening to distinctive beep tones.

# Code Calling Access

This feature allows the station user to dial a called party code to activate a signal which corresponds to the called code. The called party can then be connected to the calling party by dialing an answering code from any station within the PBX.

# Data Privacy

Activation of this feature by a station user will deny other individuals the ability to employ various overriding features to gain access to the station user’s line and consequently disturbing any data transmission which might be occurring. When the station user goes on-hook, the restriction is automatically canceled.

# Executive Override

Allows you to override an existing telephone conversation. A burst of tone informs all parties that an override is occurring.

# Loudspeaker Paging—Deluxe

Provides the station user dial access to paging equipment for the purpose of voice paging. The station user is also provided answer-back, priority paging and the ability to accommodate

a second party. Optional arrangements are available so that the station user may individually access five separate zones (1-5) and one all paging zone. If all-zones paging is not required, six separate zones (1-6) may be provided.

### **PRIORITY PAGING**

Allows a station user to dial access a paging zone or answer-back channel and may also be used to preempt any station user connected to that channel. Any existing connection is lost.

## **Radio Paging Access**

This feature allows the station user to dial a called party code to activate a radio paging unit which generates an audible signal corresponding to the dialed code. The called party can then be connected to the calling party by dialing an answering code from any station within the PBX.

## **Outgoing Trunk Queuing**

Allows you to dial a busy outgoing trunk group dial code, to be automatically placed in a queue, and to be called back when a trunk assigned to the dial code is available.

## **Threeway Conference Transfer**

A station user can effect a threeway conference and/or transfer by flashing while on any 2-party call. After flashing, the station user dials the third party (which can be a trunk) for private consultation while the second party is held. Flashing a second time effects a threeway conference. When the original party goes on-hook a transfer is accomplished. The controlling station can drop the third party by flashing during the threeway conference.

### **CONFERENCE (TO HOLD AND CONSULT WITH ANOTHER PARTY)**

Allows you to temporarily exclude a present caller to privately consult with another caller.

### **THREWAY (THREWAY CONVERSATION)**

Allows you to add a third party to an existing conversation.

### **TRANSFER**

Allows you to transfer your caller to another station.

## **Trunk Answer From Any Station (TAAS)**

Incoming calls activate a common alerting signal when night service is activated, when night stations are not assigned, or when all are busy. These calls can be answered by any station in the system.

## **Trunk Verification By Station (TVS)**

This feature permits a designated station line or a centralized attendant service (CAS) release link trunk backup station to access individual trunks of the trunk groups terminating on the PBX to make test calls to verify supervision and transmission. Incoming trunks can only be tested when the trunk is busy.

## **Features**

There are two types of feature definitions contained in the following listing:

- Features which when activated require some obvious operation, or an operation that is included in some other feature covered in this manual. These features were covered in the preceding pages.
- Features which when activated are performed automatically by the PBX, and require no specific operation of the console attendant or station user. A description of these features is contained in the following pages.

### **ALPHANUMERIC DISPLAY FOR ATTENDANT CONSOLE**

This feature provides a visual display on the attendant console up to four digits, letters, or symbols as designated for the attendant display features. The display features include: Calling number display to attendant, class-of-service display to attendant, and incoming call identification.

### **ATTENDANT CALL WAITING**

All calls completed by the attendant to a busy station are held waiting. A 2-burst tone signal is directed towards the busy station user when the attendant leaves the connection. Subsequent tone signals are applied each time the attendant leaves the waiting connection after verifying the caller's desire to wait.



## **ATTENDANT DIRECT STATION SELECTION (ADSS) WITH BUSY LAMP FIELD**

An attendant at a console can place or complete calls to stations within the PBX by pressing a nonlocking pushbutton associated with the desired station line. A visual indication of the busy or idle condition of the stations is provided via a lamp associated with each pushbutton. Buttons and lamps are provided for only 100 station lines. When more than one hundreds group capability is desired, up to 18 group select buttons are provided to allow preselection of the desired 100-line group. The average feature capacity console can be equipped with either 0 or 6 group select buttons. The large feature capacity console can be equipped with 0, 6, or 18 group select buttons.

## **ATTENDANT LOCKOUT**

Denies the attendant the ability to reenter an established connection held on an attendant console, unless recalled by a station user. The two-party hold on console feature is required for operation of this feature.

## **ATTENDANT TRANSFER—ALL CALLS**

A station user participating in any 2-party connection can call (recall) an attendant so that the attendant may transfer the call or provide other assistance as desired. A flash during any established call will return recall dial tone to the initiating station and hold the other party. The station user then dials the access code (usually "0") to call the attendant. If the call had been on the console or the initiating station is a manual originating line, the flash will result in immediate attendant recall.

## **AUDIBLE TIMED REMINDER**

A tone is heard at the attendant console when one or more calls in the busy, ring, or hold states, on the switched loop has not been serviced for 30 seconds. The tone can be disabled using AUD OFF button.

## **AUTOMATIC IDENTIFIED OUTWARD DIALING (AIOD)**

Automatically identifies a calling station or tie trunk on an outgoing CO or common control switching arrangement (CCSA) trunk to permit individual billing on toll calls.



## **BUSY LAMP FIELDS**

Provides the attendant with visual indication of the busy or idle condition of station lines via a lamp associated with each station line. Lamps are provided for only 100 lines. When more than one hundreds group capability is desired, up to 18 group select buttons are provided to allow preselection of the desired 100-line group. When the attendant DSS feature is not provided, DSS pushbuttons are not associated with the lamps.

## **CALLING NUMBER DISPLAY TO ATTENDANT**

Provides the attendant with a visual display of the station number of any PBX station seeking attendant assistance. The number is displayed on the alphanumeric display.

## **CALLS WAITING—VISUAL AND AUDIBLE INDICATIONS**

The CW (calls waiting) lamp on the attendant console will flash when the number of calls waiting is equal to or greater than the established calls waiting level. This level may be administered from 1-9. If it is not administered a level of 3 calls is automatically inserted. When less than 3 calls are waiting, the CW lamp is lighted steadily. When one call is waiting, the audible reminder tone is heard.

## **CCSA ACCESS**

Provides access to a common control switching arrangement (CCSA) network for network inward dialing to the PBX, direct outward dialing to the network, and other features similar to those provided on the exchange network. Instructions will be given locally for CCSA operations.

## **CLASS-OF-SERVICE DISPLAY TO ATTENDANT**

Provides the attendant with an alpha or numeric code display requesting the class of service of the calling PBX station. The information is displayed on the alphanumeric display when the class of service CLASS button is pressed.

## **CODE RESTRICTION**

Denies selected station lines completion of dialed outgoing exchange network calls to selected office and area codes. The restricted calls are routed to intercept tone.

## **DATA RESTRICTION**

If this feature has been assigned to either a line or trunk on a connection, call waiting (including attendant call waiting), trunk verification by customer, and the busy verification of station line features are denied access to the connection.

## **DIRECT INWARD DIALING**

Allows an incoming call from the CO to reach a station without attendant assistance. Direct inward dialing is provided for some stations and not provided for other stations in the same PBX. Non-direct inward dialing stations are routed to the attendant.

## **DIRECT OUTWARD DIALING**

Allows a station user by dialing an access code to gain access to the network facilities without the assistance of the attendant. Upon receipt of second dial tone, the station user may proceed to dial the desired number.

## **DIRECT TRUNK GROUP SELECTION**

Allows the attendant, active on a switched loop, to directly access an idle outgoing trunk in a given trunk group by pressing the button associated with the desired trunk group.

## **DISTINCTIVE RINGING**

Unique patterns of station ringing are provided to permit the station user to distinguish between various types of calls. Three patterns are available as follows:

1. One-burst (normal) ringing indicates station-to-station call.
2. Two-burst ringing indicates attendant call or CO call.
3. Three-burst ringing indicates either automatic callback, originating call waiting, outgoing trunk queuing callback, or a night service call to the default or common night station. The station may have only one of these features active at a time, and the station user can, therefore, identify the type of call.

## **END OF DIGIT DIALING**

When dialing is complete, the # (pound) button may be pressed to signify to the PBX that all digits have been dialed thereby eliminating the timeout interval.

## **FLEXIBLE NUMBERING OF STATIONS**

Station numbers can be assigned to lines at the time of installation in accordance with customer-designed numbering plan and can be reassigned while in service to permit personnel moves without requiring number changes. Station number assignments can begin with any digit except \*, #, and 0 but must be fixed in length to either two, three or four digits in the same installation. The same first digit cannot be used for both station numbers and trunk or feature access codes. The same first digit can be used for trunk and feature access codes.

## **FOREIGN EXCHANGE (FX) SERVICE**

Provides direct access to a distant CO via foreign exchange trunks. Incoming FX calls are handled by the attendant, as described under Incoming Calls. Outgoing FX calls are made by the attendant, as described in Outgoing Calls, or by stations using the access code.

## **INCOMING CALL IDENTIFICATION DISPLAY**

Incoming call identification occurs under two different configurations. An indicator lamp display consists of six non-operating buttons, with associated indicator lamps. An alphanumeric display consists of a display of up to four numbers or letters.

## **INDICATOR LAMP DISPLAY**

Provides a visual identity of the type of call or trunk group associated with a call directed to the attendant. The visual indication is provided via an indicator lamp. Up to six incoming call indicators are provided on the console.

## **ALPHANUMERIC DISPLAY**

Calling identification display to the attendant.

Provides the attendant with a visual display of the station number of any PBX station or incoming network call (WATS, FX, etc.) seeking attendant assistance.

Class-of-service display to attendant.

Provides an alpha or numeric code representing the class of service of any PBX station calling the attendant. The class of service identifies whether the station is restricted from making calls. It allows the attendant to determine whether to set up or refuse the requested connection. The class-of-service CLASS button must be pressed to replace the station number display with the class of service. Pressing the CLASS button the second time returns the station number display. Subsequent operations alternate between class-of-service and station number display.

## **LAMP TEST**

At any time, the test/reminder tone switch may be operated to check that all console lamps will light. There is no lamp above the START, CANC, ANSWER, and HOLD buttons. All console lamps except the major and minor alarm lamps should light when the test switch is operated. The audible signal should sound, and alphanumeric display (if provided) should display the word TEST.

## **LINE LOCKOUT WITH WARNING**

During call origination, provides 10 seconds of intercept tone and then holds the station out of service when a station remains off-hook for longer than 10-seconds without dialing. After the station goes on-hook, it may be used normally, to make and receive calls. Calls attempting to reach the station will receive busy tone.

## **MULTIPLE CONSOLE OPERATION**

Each call appears on only one console, and each console can receive only one new call at a time. If all consoles are busy when a new call arrives, the call will be held waiting until a console becomes available. The CW lamp on each console lights when one or more calls are waiting to be switched to a console. The PR lamp lights when a call from another console is waiting.

## **MULTIPLE-LISTED DIRECTORY NUMBERS (LDNs)**

More than one CO listed directory number (LDN) can be associated with a single installation. Each LDN can be assigned a unique incoming call indication.

## **MUSIC-ON-HOLD ACCESS**

This feature provides customer-furnished music or other audible indication to the held party during the hold interval. The held call condition can be the result of attendant hold, call hold, or threeway conference transfer hold, or the hold associated with other similar features.

## **POWER FAILURE TRANSFER**

Provides service to, and/or from, the CO for a limited number of prearranged stations when a power failure occurs. Power failure transfer is not available for direct inward dialing trunks. When a power failure occurs, each CO trunk is connected directly to the predesigned station line, bypassing the PBX system and removing all restrictions and system features. When power is restored, the system always returns to night service mode. When the night lamp on console flashes or lights steadily, press NIGHT button, and the console is in service. After the console is returned to service, the attendant should refer to Feature Changes, Page if flexible night connections have been established, they may need to be reestablished before placing the console in night mode.

## **PRIVACY AND LOCKOUT**

Privacy automatically splits the connection when the attendant would normally be bridged on a call with both a calling and called party. Lockout denies the attendant the ability to reenter an established connection held on the console unless recalled by the station.

## **RECORDED ANNOUNCEMENT INTERCEPT**

Intercepted calls are routed to a recorded message which indicates the reason why the call was intercepted. This intercept treatment is provided as an alternative to ATTENDANT INTERCEPT or INTERCEPT TONE for DID and CCSA calls only, as a system option. Only one message can be given.

## **RECORDED TELEPHONE DICTATION ACCESS**

Permits access to and control of customer-owned dictating equipment within the system. The start and stop functions of customer-owned telephone dictating equipment may be voice controlled or dial controlled. The record and playback functions are dial controlled. Instructions will be given locally.

## **RESTRICTIONS**

### **(Fully)**

Station is denied the ability to place or receive any calls, other than station-to-station. All restricted calls are routed to intercept tone.

### **(Inward)**

Station is prevented from receiving incoming network calls. All calls from outside the PBX system are routed to the attendant. When the attendant attempts to complete a call, intercept tone is heard.

## **Manual Originating Line Service**

The station lines are arranged to automatically route the attendant position for completion when the station user goes off-hook for service. Dial tone is not provided to these lines and originating connections are made to the attendant. Calls can be received normally by the manual line.

## **Manual Terminating Line**

Terminating calls must be handled by the attendant for completion. Nonattendant-handled calls to these stations are routed to intercept tone. Originating calls are dialed in the normal manner.

## **Miscellaneous Trunk**

Denies preselected stations and dial-repeating tie-trunks access to preselected miscellaneous trunk groups that may include CO, FX, WATS, tie-trunks, and auxiliary trunks. Restricted call attempts are given intercept tone.

## **Origination**

Station cannot originate calls. Attempted originations are given 10 seconds of intercept tone. Terminating calls are completed normally.

## **Outward**

Outward-restricted stations within the PBX system are denied the ability to make outgoing central office and CCSA calls without the assistance of the attendant but may make intercom, loudspeaker paging, and tie trunk calls. When a station attempts to complete a restricted call, intercept tone will be heard.

## **Termination**

Station cannot receive calls. All terminating calls are routed to intercept tone or to the attendant. Calls can be originated normally.

## **Route Advance**

This feature routes outgoing calls over alternate facilities when the first choice trunk group is busy. The station user selects the first choice route by dialing the corresponding access code, and the equipment automatically advances to alternate trunk groups. The digits following the access code must be identical for any of the trunk groups selected. The alternate trunk groups may also be accessed by other codes. Up to ten route advance groups may be provided, each containing a maximum of five groups.

## **Serial Call**

Allows the attendant to complete an incoming trunk call to two or more station lines in succession without requiring the called station user(s) to recall the attendant. This feature is implemented through the use of the two-party hold on console feature.

## **Station Hunting**

This feature routes a call to an idle station line in a prearranged group (ordered list of stations) when the called station line is busy.



## **Terminal Hunting**

The hunt always starts with the called station line and ends with the last station line in the prearranged group, completing the call to the first idle station line encountered. Unless the first station line is called, only a portion of the group is tested. The prearranged hunting sequence can be either consecutive (station numbers are in ascending numerical sequence) or nonconsecutive.

## **Circular Hunting**

The hunt starts with the called station line and always proceeds in a prearranged order to test all lines in the group once, completing the call to the first idle station line. The station's number may be in consecutive or nonconsecutive order.

## **Tandem Tie Trunk Switching**

Allows tie trunk-to-tie trunk, tie trunk-to-CCSA and tie trunk-to-central office connections through the switching system dialed directly by the distant PBX station. Tandem connections may be restricted on a trunk group basis. Restricted calls get intercept tone.

## **Tie Trunk Access**

Tie trunks connect one PBX directly with another PBX. There are several types of tie trunks with corresponding differences in operation. Follow local instructions for the operation of any tie trunks at your console.

## **Time Reminder**

A lamp signal automatically alerts the attendant after 30 seconds when a call on the console is waiting (attendant call waiting), when a called party has not answered, or when a call is held on the console. The signal is retired when the connection is re seized by the attendant and will be reactivated for 30 seconds after the attendant releases, if the call is still waiting, unanswered, or held.

## **Timed Reminders Tone**

A timed reminder tone (1.95 kHz) will be given to the attendant at the rate of 400 msec on, 12000 msec off, whenever one or more calls in the busy, ring, or hold status on the switched loops have not been serviced after 30 seconds. It may be disabled through a switch on the front on the console. The visual timed reminder signal will continue to be the 400 msec on, 400 msec off flashing loop lamp.

## **Toll Restriction**

Prevents completion of toll calls or calls to the toll operator. Restricted toll calls are given intercept tone.

## **Trunk Group Indicators**

**BUSY INDICATORS**—Provides a visual indication when all trunks in a group either single trunk group or route advance group are busy. Up to 24 BUSY lamps may be provided.

**WARNING INDICATORS**—Provides a visual indication when a preset threshold of idle trunks in a group either single trunk group or route advance group is reached. The threshold indicates the number of trunks in a trunk group that are not busy. Up to 12 WARN lamps may be provided.

## **Trunk-To-Trunk Connections**

Allows an incoming or outgoing trunk call to be extended by the attendant to another outgoing trunk. Connections can be made between CO, FX, WATS, CCSA network, and tie trunks. If the attendant originates both connections in a trunk-to-trunk call, the call must be held on the console using the two-party hold feature so the attendant can maintain supervision.

## **Visually Impaired Attendant Service**

Visually impaired attendant service is designed to aid visually impaired PBX attendants. This service provides a light-sensitive probe, grooved console face plate, and additional audible tone which identify the type of call. Also, specially designed DIMENSION PBX consoles (02AF) allow plugging an audible tone adjunct (2A translator) directly into the console.

## **WATS Service**

Provides access to or from a WATS (wide area telecommunication service) serving CO. All incoming calls to the PBX system are placed to the assigned INWATS number and are answered by the attendant, as described in Incoming Calls. OUTWATS calls to the various geographical areas may be made on an attendant-handled basis, as described in Outgoing Calls, or may be dialed by station user.



## **Tones**

### **DIAL TONE**

\*A continuous steady tone (you can dial).

### **RECALL DIAL TONE**

\*Three short tones followed by a steady tone (action accepted; proceed with dialing).

### **CONFIRMATION TONE**

\*Three short tones (action accepted; service is in operation).

### **BUSY TONE**

\*Short tone repeated 60 times a minute (the party dialed is busy).

### **REORDER (FAST BUSY) TONE**

\*A fast busy tone repeated 120 times a minute (call temporarily blocked; try later).

### **INTERCEPT (SIREN)TONE**

\*Alternating, high and low "siren" tone (dialing error made or special service denied).

### **RING TONE**

\*One short ring (a call from a station)

\*Two short rings (a call from the attendant or outside the system).

\*Three Short rings (a priority call).

### **SPECIAL AUDIBLE RING**

\*A ring with a lower pitch at the end (indicates called station has received call waiting signal).

### **CALL WAITING SIGNALS**

\*One quick beep (a call from another station is waiting).

\*Two quick beeps (a call from the outside or the attendant is waiting).

\*Three quick beeps (a priority call is waiting).

### **OVERRIDE WARNING TONE**

\*A long tone (signals the called station of an override).

### **TIMED REMINDERS TONE**

\*ON-OFF, high pitched tone (ON approximately 1/3 second—OFF approximately 1 second)

# CUSTOMER ADMINISTRATION CENTER SYSTEM (CACS)

The CACS is a stored-program controlled system using the DIMENSION® processor and is housed in a standard DIMENSION® PBX cabinet.

The CACS, which is based on the technology used in the Remote Maintenance, Administration, and Traffic System (RMATS), provides a means whereby a customer may do any one or all of the following from the CACS location:

- Station rearrangement and change
- Facilities administration and control
- Facilities assurance reports
- Access to traffic data

Access to the CACS-associated DIMENSION® PBX systems is via a switched connection to a dedicated, data set-equipped CO line at each PBX. This is the same access point used for Telco RMATS access. A customer-owned or Bell System-leased terminal, such as DATASPEED® 40/2 or the Teletype model 43 Teleprinter provides the necessary CACS user communications.

## 1. Station Rearrangement and Change

A. On a per line basis, the customer is able to add, change or remove the following:

- line extension number
- class of service assignments
- hunt to number
- call pickup group
- auxiliary automatic number
- identification (ANI) number billing
- controlled restriction group
- speed calling
- customer intercom

B. On a per ECTS station basis, the customer has the capability to assign, change or remove the following:

- automatic line connection preferences
- buttons for
  - hold (all types)
  - manual signaling
  - message waiting

- abbreviated/delayed (A/D) ringing
  - exclusion
  - station ringer cutoff
  - ringing transfer
  - custom calling (all features)
  - direct station selection (DSS)
  - station busy
  - dial intercom
  - custom telephone intercom
  - line ringing options
  - manual signaling tone
  - intercom ring options
- C. The customer has the ability to identify manually or via automatic search routines:
- the stations in a pickup group
  - stations with the same class of service
  - stations belonging to the same controlled restriction group
  - speed call numbers for a given station
  - "hunt to" sequence for a given station
  - class of service definitions
  - miscellaneous parameters for a given station (i.e., equipment location, hunts number, hot line, etc.)

## 2. Facilities, Admin. and Control

- A. On a per system basis, the customer will be able to do the following:
- assign and change default facility restriction level (FRL) associated with incoming access trunks
  - list automatic route selection (ARS) plans and routes
  - change ARS plan in effect (manual control) and activate timed plan activation (automatic mode)
  - list automatic alternate routing (AAR) patterns (1-91) and associated location codes
  - list authorization codes for a given FRL
  - assign or change a FRL for a given authorization code

- list all authorization codes with its FRL
- list the trunk groups for a given FRL
- list the queue status of any trunk group
- cancel and activate queuing on a per trunk group basis
- obtain a maintenance busy trunk list
- read and adjust the DIMENSION® PBX Time-of-day clock for ARS pattern control

### 3. Facilities Assurance Reports

- A. On a per system basis, the customer may print or display the audit trail associated with automatic circuit assurance (ACA). This report provides the following information:
- trunk identification
  - short or long call failure
  - time of day and date
  - whether attendant tested trunk using trunk verification by customer (TVC)

### 4. Traffic Data to Customer

- A. The traffic polling and processing capability of the CACS is as follows:
- automatically poll 10 FP8 PBX's on a daily basis for 16 days
  - automatically poll 10 FP8 PBX's hourly for 16 hours/day and retain the results for the last 16 hours
  - makes two attempts to poll after an unsuccessful poll
- B. The following traffic reports may be displayed or printed on a per system basis:
- traffic summaries
  - exception reports
  - raw traffic data

# CENTRALIZED STATION MESSAGE DETAIL RECORDING (CSMDR) SYSTEM

The CSMDR System provides for the collection of message detail data at a central location from the local or remote DIMENSION® PBX Systems and/or No. 1/1A ESS for multilocation customers.

The CSMDR System consists of a Centralized Message Detail Recorder (CMDR) and up to 31 Local Storage Units (LSUs). The LSUs store the data (station calling information) and the CMDR polls the LSUs and collects all the station information at one central location over either the dial network or a private switched network.

## Centralized Message Detail Recorder Feature List

- Polling Capability
  - Up to 3 polling ports
  - Up to 31 LSUs
  - Error detection and retransmission protocol
  - Up to 24,000 call records/busy hour
  - DDD or private switched network access to LSUs
- Tape Features
  - Data recorded in Bell System - Binary Coded Decimal (BS-BCD), American Standard Code for Information Interchange (ASCII), or Extended Binary Coded Decimal Interchange Code (EBCDIC)
  - Standard 9-track recording format: American National Standards Institute (ANSI) X3.39 standard
  - Capacity 200,000 call records/tape (BS-BCD)  
100,000 call records/tape (ASCII or EBCDIC)
  - Optional second tape drive
- Direct Output Features
  - Standard binary synchronous protocol
  - Interfaces with 2400 bits per second (bps) full duplex synchronous data set
  - Transparent and non-transparent modes
  - Data transmitted in BS-BCD, ASCII, or EBCDIC

- Maintenance Features
  - Memory integrity tests
  - Recorder integrity tests
  - Data set loop-back tests
  - Reports troubles to RMATS Center
  - Error reports
  - Alarms - internal and/or external
  - Battery backed memory
  - Maintenance port
  - Status lights
- Customer Terminal
  - Polling schedule initialization
    - 1/2 hour resolution
    - capability to vary with day of week
  - Data collection network status
  - Calendar/Clock Setting
    - displayed on control panel
    - 365-day calendar
    - minute resolution
    - synchronizes network LSUs

The CMDR unit can diagnose problems within itself, and automatically print out error messages in the appropriate RMATS Center. Some of the error messages that should be reported to telephone repair are:

- "Autodialer dialing failed"

The autodialer attempted to dial the number, but a failure in the autodialer or the dial network caused the dialing attempt to fail before dialing was completed. The port is taken out of service and an alarm raised. If this message is seen, call the Telephone Company Repair Service.

- "Bad MDR"

This message will appear if the CMDR receives an invalid data record from the LSU. If the message is seen, call the Telephone Company Repair Service.

- "Login failed: bad password"

The CMDR cannot log on at the LSU because the CMDR's copy of the LSU's password is incorrect. This will most likely occur if the contents of the CMDR memory are lost due to a power failure in excess of 8 hours. If you know what the LSU password was before the power failure, the password may be entered through the "control" command. Otherwise, call the Telephone Company Repair Service.

- "Login failed: invalid id"

This message should not appear: if it does, call the Telephone Company Repair Service.

- "LSU clock set failed"

The LSU has failed to respond to a CMDR clock set command. Try polling the LSU manually. The next time the LSU is polled automatically, the CMDR will attempt to reset the LSU clock. If the clock set fails again, contact the Telephone Company Repair Service.

- "LSU control parm set failed"

The LSU did not reset its storage control parameters in response to a CMDR command. Try setting the parameters again, if this attempt fails call the Telephone Company Repair Service.

- "Too many failed pages - x out of yy"

The LSU has had too many pages removed from service due to failures upon retrieval of the data. You should call the Telephone Company Repair Service.

- "Too many retries"

The indicated LSU has been polled five times without successfully concluding a polling session. The LSU will be taken out of service and an alarm raised. You should call the Telephone Company Repair Service.

- "Tape 0: test failure"  
"Tape 1: test failure"

The tape unit has failed a diagnostic. This message will usually appear with the test failure message. As with the write failure, you should unload, then replace the tape. If the tape continues to fail, call the Telephone Company Repair Service.

- "Tape 0: write failure"  
"Tape 1: write failure"

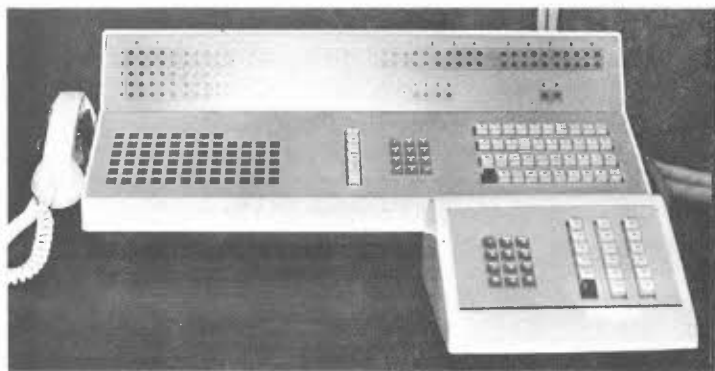
The indicated tape unit has failed to successfully write a block to tape despite several retries. You should unload the failing tape unit and then load the tape unit with another tape. If the new tape passes diagnostics, the failure was probably due to a bad tape reel. If the tape unit continues to fail, call the Telephone Company Repair Service.

- "Tape buffer failed"

The tape buffers have failed diagnostics: Call the Telephone Company Repair Service.



# AUTOMATIC CALL DISTRIBUTOR



**2B ACD**

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An Automatic Call Distributor or ACD is a telephone system that permits the automatic distribution of incoming calls to attendant answering positions in the approximate sequence of their arrival and with an approximate equalization of traffic among the positions.

Many businesses require various and diverse communications needs. Our response to this need is our line of Special Systems. These systems distribute large volumes of incoming calls to teams of attendants for the service industries, provide total intercom services for small and medium sized businesses, dispatch emergency calls to the proper authorities for municipalities and institutions and allow service to be provided to outlying clients of telephone answering bureaus.

**Telephone Answering Services** are organizations who require special switchboards to answer their clients telephones from a central location. The purpose of the Telephone Answering Service is to answer calls to subscribers such as business concerns, doctors, lawyers, etc., and other people desiring telephone answering service.

The method of handling an individual call is determined by mutual agreement between the subscriber and the answering bureau personnel. The attendant may answer all calls or only those occurring at certain times. In most cases, the attendant is instructed to answer calls only on the third or fourth ring, thereby allowing time for the subscriber to answer personally if desired.

The special switchboard used by answering services is a combined PBX and secretarial service switchboard designed to work with the Concentrator Identifier. This system provides originating equipment at the central office and terminating equipment at the telephone answering bureau and permits 40, 60, 80, or 100 subscribers to be concentrated and served by two to six trunks. At the answering bureau, each subscriber line is associated with a switchboard position line lamp and jack circuit which has an associated ringup circuit at the concentrator in the central office.

# AUTOTAS\*

AUTOTAS\* is a microprocessor controlled multi-featured Bell System product specifically designed to meet the needs of the Telephone Answering Service (TAS) Industry. This system utilizes standard Bell System Key telephone instruments, desk top operator display consoles and an electronic concentrator. The AUTOTAS system allows the telephone answering service owner to improve profitably by improving client services, reducing labor costs, and increasing operator efficiency.

The AUTOTAS operator console provides:

**Line Identification Display** — indicates line on the Call Director to be answered.

**Subscriber Identification Display** — indicates the account number of the called client.

**Answering Phrase Display** — tells the operator how to answer the call plus additional account information (up to 32 alphanumeric characters.)

**Message Waiting Light and Switch** — lights when designated client ID is displayed. (Activated by operator when message is taken and cleared when message is delivered.)

**Special Instruction Light and Switch** — lights when designated client ID is displayed. (Activated by operator when special instruction is taken and cleared when special instruction ends.)

**Call Waiting Light** — lights to indicate caller(s) on HOLD.

**In/Out Switch** — when IN, allows calls to be taken by this operator station. When OUT, calls are not directed to this station.

**Mute Switch** — permits operator to place call on HOLD at a specific station.

**Patcher** — allows operator to patch two calls simultaneously with automatic disconnect.

\*Registered trademark of Candela Electronics Corporation

The AUTOTAS management terminal provides:

**Account Information Entry/Update** — allows initial entry or change for the client 32-characters answering phrase appearing on the operator console.

**Account Information Tape Back-up** — allows TAS management to store account information on tape cassette for power failure back-up.

**Account Information Tape Re-load** — allows immediate loading of stored account information in case of power failure.

**Electronic Concentrator Ring Count Entry/Update** — allows TAS management to enter or change the ring count for an individual concentrator client or to change the ring count for all concentrator clients simultaneously.

**Traffic Analysis Reports** — following are the available reports:

- (a) Number of incoming calls per client.
- (b) Percentage of calls on HOLD for less than 15 seconds and greater than 15 seconds.
- (c) Number of incoming and outgoing calls handled at each operator console.
- (d) Total time spent on outgoing calls per operator.
- (e) Total time each operator console is removed from the system.

**System Self-Test Report** — when self-test cycle is activated, displays PASS or FAIL on screen for individual system components.

## Features of AUTOTAS

**Uniform Call Distribution (UCD)** — improves operator efficiency by uniformly distributing calls to available operators enabling more subscriber calls per operator through system-paced instead of operator-paced answering. UCD improves client service by directing calls to the first available operator.

**Electronic Concentrator with Auto Ring Count** — the central office located electronic concentrator transfer the call after automatically counting the specified number of rings, eliminating operator ring counting and increasing operator efficiency. Ring count can be varied by time of day, allowing clients flexibility in work habits.

**32 Character Answering Phrase** — Upon audible and visual alert, the operator just pushes a button on the Key set and reads the 32-Character answering phrase on the Operator Console.

**Identified Call Forwarding (CF)** — through the use of Direct Inward Dial trunks and Bell System Call Forwarding, any client can use TAS without a secretarial line.

**Identified Call Diverter** — in those areas where CF is not available, and an electronic concentrator is not economically justified, a call diverter can be used.

**Patching with Automatic Disconnect** — the patcher allows an operator to patch any incoming call to an outgoing line. Patched calls are automatically disconnected without operator supervision.

**Switch-Selectable Automatic or Manual Answering** — a management accessible switch on the Call Distributor allows incoming calls to either be answered with a taped message or to be directed to an operator.

**Switch-Selectable Uniform or Sequential Call Distribution** — a management accessible switch on the Call Distributor allows incoming calls to either be uniformly distributed to operators or to be distributed in a management defined sequence.

**Special Instruction Light and Switch** — allows an operator to search the message rack for special instructions only when required.

**Message Waiting Light and Switch** — allows an operator to know immediately without searching the message file if a client has messages outstanding.

**Operator Console In/Out Switch** — allows management to simply concentrate incoming calls to a segment of the total operator consoles.

**Operator Alert that Calls are Waiting** — the call waiting light flashes at each operator console when callers are HOLDING.

**Plug In Jack for Music on Hold** — a jack is available to plug in a music source so that callers on HOLD will hear music.

**Hotel/Motel Service** is based on the use of special PBX systems to provide the kind of service needed by hotels and motels to serve their guests. This system provides a message accounting service. Hotel/Motel guests are billed according to the number of message units charged to the room.

The system has a display unit which provides for information exchanges between the customer premises and the ESS Central Office. When the cashier turns the display unit on and keys in the desired room number, that room number appears on the room number indicator and the message units accrued by that room appear on the message unit indicator.

**Emergency Reporting Service** systems are designed for use by municipalities or industries to route emergency calls quickly and efficiently. Municipal emergency reporting telephone systems can be used as fire reporting systems, police reporting systems, and as reporting systems that combine fire, police, and other emergency reporting by the general public. These systems are (a) by the general public in reporting emergencies to a centrally located municipal headquarters and (b) by municipal employees and patrolmen in routine communication with headquarters. Industrial Reporting Systems are designed for use by industrial plants and manufacturing concerns where it is desired to receive emergency and routine calls, monitor various plant mechanical, electrical, hydraulic, gas, and water systems, and observe the progress of guard tours at a central control room switchboard.

Calls to the emergency reporting systems are originated at outdoor and indoor telephone sets located at strategic points on streets and highways, in public buildings, and in schools and hospitals. Calls originated from an emergency reporting system station are automatically directed to the appropriate answering position.

Emergency calls from telephone company customer stations via telephone company equipment may also be handled at the switchboard.

Emergency reporting systems may be arranged to provide a printed record of the calling station number as well as the date and time that calls are initiated. Answering switchboards are also arranged to provide, on an optional basis, voice recording on incoming calls, voice paging, and signal and status indications.

# Types of ACDS

## **2A AUTOMATIC CALL DISTRIBUTOR**

The 2A ACD is a crossbar switching system arranged for automatic distribution of incoming calls to attendants, providing for up to 60 attendant positions. The system is arranged so that the basic cabinet and the power cabinets provide requirements for 20 attendant trunks and 36 incoming trunks.

## **2B AUTOMATIC CALL DISTRIBUTOR**

The 2B ACD is a cabinetized switching system utilizing a crossbar switching network to provide facilities for up to 70 attendant positions (agents) and 68 incoming trunks. The first cabinet (basic) can serve up to 10 positions and 20 incoming trunks. Each cabinet when fully equipped weighs approximately 800 lbs. The full system requires approximately 28 sq. ft. and its sound proof construction permits its location in an office environment.

## **3A AUTOMATIC CALL DISTRIBUTOR**

The 3A ACD is intended for use by airlines, public utilities, mail order houses and similar businesses with a large volume of incoming calls requesting assistance and information. It provides up to 198 trunks, 2 test trunks and 200 attendant positions, both in increments of 10 or 20. The system utilizes step-by-step switching with an electromechanical control. Calls are distributed to a team of service attendants in the approximate order of arrival and in the order of attendant availability. A lamp cabinet and a 12A console is provided for each supervisory position.

## **4A CALL DISTRIBUTOR**

The 4A CD is designed for small businesses with a moderate volume of incoming calls, who want to respond to their customers quickly and efficiently, but who cannot justify an ACD operation. It provides up to 20 trunks in increments of 2 and up to 8 or 15 attendant positions. The system utilizes solid state switching with regular key telephone features including queuing of calls, overflow, etc.



### **3A COMMUNICATIONS SYSTEM**

This system, designed for hospitals, provides direct nurse-patient intercommunication as well as regular telephone service for the patient. The system consists of a nurse's console, Patient's Telephone Set and a Switching Cabinet. It has the ability for patients emergency signaling and access to C.O. and centrex or PBX lines.

### **CONCENTRATOR-IDENTIFIER**

The Concentrator-Identifier (J-93021) concentrates 100 subscriber lines down to 2 to 6 trunks between the central office and the telephone answering bureau and enables the bureau to identify called subscriber stations. The originating equipment consisting of relay racks is located in the central office and the terminating equipment is located in the answering bureau and is used with a 557A or B PBX switchboard.

### **CENTRALIZED ATTENDANT SERVICE**

Centralized Attendant Service (CAD) is an operating arrangement that allows multilocation business customers who have separate PBX systems at each location (branch) to concentrate their attendants at one location (main). The advantage of a Centralized Attendant point is that fewer attendants are required, resulting in reduced operating cost and easier administrative control.

### **50A CUSTOMER PREMISES SYSTEM**

The 50A CPS provides PBX services to subscribers but does not require a large PBX unit on the premises. Utilizing the switching capability of the No. 1 ESS office, the 50A CPS provides dial PBX and centrex services with only a small control unit in the subscriber's office. The control unit is designed in the flexible circuit modular panel concept.

### **60A CUSTOMER PREMISES SYSTEM**

The 60A CPS is designed to provide ESS-ACD service for moderate to large business customers that have a high volume of incoming calls. It utilizes the facilities of a No. 1 ESS office thereby reducing the equipment needs on a customer's premises. It offers many new features and has a capacity of up to 1000 agent and/or supervisory positions.



## **90A CUSTOMER PREMISES SYSTEM**

The 90A CPS provides a message accounting service to facilities such as Hotels, Motels, Hospitals, etc. Utilizing the facilities of No. 1 ESS office, the 90A CPS will provide this service without the need of traffic registers on the customer's premises.

## **310 SWITCHING SYSTEM**

The 310 Switching System is a manual dispatching system designed primarily for the power and petroleum industries. It permits the attendant to answer, interconnect and/or conference a variety of lines and trunks. The system consists of crossbar switching equipment and one or more consoles. It is available in sizes from 40 to 100 lines and can be used as a replacement for the 508 Switchboard.

## **400 SWITCHING SYSTEM**

The 400 Switching System is a common control dial intercommunicating system that utilizes crossbar switches and wire spring relays. It is designed primarily for applications where limited access to central office lines is required. The basic system has a 20 line capacity but can be expanded to 30 or 40 lines by adding 1 or 2 plug-in (10 station line) supplementary units.

## **520 PBX—EMERGENCY REPORTING SYSTEM**

The 520 type PBX system provides facilities for connecting remotely located reporting stations and an emergency reporting center. It permits routine communications between municipal employees and their headquarters. The system is comprised basically of the communication center (520 type PBX) with either direct line cabling or a concentrator arrangement and the reporting telephone which can be located on streets or highways, public buildings, schools, hospitals, and industrial plants.



# **SPECIAL SERVICES**

## **Special Services Telegraph**

- All services which terminate in Telephone Company maintained teletypewriter apparatus regardless of the type of facility to which the service is assigned and which terminate in a Bell System data set associated with Bell System maintained teletypewriter apparatus.
- Those services identified by service codes MR, TT, or TS in the circuit identification.
- Those services that use USOC code 1LY and use CPE station equipment.

Companies such as Western Union and the various news services use telegraph lines (Telephone Company lines) to send their messages, which are printed out on teletypewriters.

## **Data-Switched**

Data Switched service is that service which terminates in a Bell System data set or an alternate voice data arrangement and which has access to the switched network. This class of service cannot be directly associated with a Bell System provided teletypewriter. This category takes precedence over lower categories such as WATS, FX, etc., and such services terminating in a data set will be coded to this class of service.

## **Data-Private Line**

Data private line is any nonswitched data service which terminates in a Bell System or customer provided data set and which is not associated with a Bell System provided teletypewriter.

(see Circuit Identification code GD.)

## **Inward WATS**

In-WATS users may call in only. Anyone at any place can call in, providing the In-WATS number is dialed and is inside the proper In-WATS band. No special phone is needed and the caller will not be charged for a long distance call.

In-WATS lines are always assigned a special 10 digit number.

800 is the Special Area Code for In-WATS numbers.

Example: 800-292-3456

## **Outward WATS**

Out-WATS users may only call out. Anyone in the central location (usually a home office) can call out to anyone anywhere, providing they use the Out-WATS line and the person called is in the Out-WATS band. Again, no special phone is necessary. If you have this service, you do not have to pay a separate toll charge for each call in the area covered by your WATS service.

Each Out-WATS line is assigned a seven (7) digit number. The first digit of the number begins with a 0 or 1.

Example: 075-2982

175-2982

## **Video**

Channels or facilities furnished for wideband video transmission. Typical services are Community Antenna Television (CATV), Educational Television (ETV), Studio Transmitter Links, Studio Network Links, etc.)

## **Mobile**

All mobile telephone service furnished to the general public that work with Telephone Company base stations, including systems dedicated for Telephone Company use. These services include Urban, Highway, Maritime, Private, Maintenance, Bellboy Personal Signaling Service, and customer-owned mobile units working with the Telephone Company base stations and land line facilities.

MOBILE TELEPHONE SERVICES permit conversations between a regular telephone and a vehicle or between two vehicles. These services are not available in all areas of the country.

## **Special Services Telephone**

Those voice grade services, which are used on a special service basis and which do not terminate in a teletypewriter or data set. They may be equipped with wire voice repeater, or carrier facilities.

## **Typical services**

- Alarm Circuits
- Bell and Light (Civil Defense)
- Control Circuits
- Dispatch Circuits
- Foreign Exchange (FX) lines
- Leased Lines
- Local Distribution Facilities of other Common Carrier (OCC)
- Music Distribution Services
- Outside Extensions (Off-Premises) through a Central Office (CO) Main Distributing Frame (MDF) terminating in another central office area
- Program Circuits
- Radio Land Lines
- Remote Metering
- Tie Lines
- Western Union Access Lines

## **CUSTOMER PROVIDED EQUIPMENT (CPE)**

**Authorized Customer Provided Equipment** is terminal equipment provided by the customer and properly connected to telephone company facilities or equipment pursuant to the appropriate tariff regulations. Equipment, such as customer owned shoulder rests, stick-on dial cards, etc., which does not physically, inductively, or acoustically terminate in telephone company facilities, or equipment, may not be considered as CPE for purposes of determining the applicability of a Maintenance of Service Charge.

**Unauthorized CPE** is terminal equipment provided by the customer and connected to telephone company facilities or equipment in violation of tariff regulations.

All trouble reports on CPE will be handled in a normal manner. Upon receipt of a trouble ticket at the test desk, the tester shall test the line. If there is an indication of trouble in the CPE, the tester will make every effort to notify the customer or their authorized representative that if a visit is made and the trouble is caused by the customer provided terminal equipment, a Maintenance of Service Charge (MSC) will apply.

- Western Union T.W.X. access lines are classified as C.P.E.
- Each private line circuit that has a line termination directly in customer provided equipment is classified C.P.E.
- All facilities that have been assigned a circuit number and are leased to other common carriers are classified C.P.E. or Telco, based on the equipment in which they terminate.

## OTHER COMMON CARRIER (OCC)

The Bell Companies provide various facility and/or termination arrangements to other Common Carriers (OCC's). The **Other Common Carrier (OCC's)** are regulated communications common carriers authorized by the Federal Communications Commission (FCC) to provide interstate private line communications services to their patrons; i.e., MCI and RCA.

**The Trouble Reporting Control Office (TRCO)** is the designated Bell Company work group responsible for the installation and maintenance of the Bell-provided facility and/or termination. TRCO must exercise supervision and control of the Bell-provided facility and/or termination furnished to the OCC.

Subscriber — is the customer of Bell Company services.

Patron — is the subscriber of Other Common Carrier services.

Other Common Carriers will report troubles to the local test bureaus during normal working hours. When the local test bureaus close, the trouble reports are called into the bureaus who normally take customer trouble reports after normal working hours. Procedures for handling Other Common Carrier trouble reports will be given you locally.

## PRIVATE LINE SERVICE

Private lines are non-switched facilities which have no access to the direct distance dialing (DDD) network. Private lines are either two-point or multipoint. Two-point private lines involve facilities and equipment between two terminal locations. Multipoint private lines involve circuits to several customer locations which are bridged together at a central office. Terminal equipment may be furnished—by either the Telephone Company or the customer. Private lines may be voice and/or data.

Signaling on private line circuits may be accomplished by:

- (1) **Manual ringdown** signaling arrangements normally have a button or key arrangement at the station which, when operated, causes a ringing signal to be applied to the telephone at the distant end.
- (2) **Automatic ringdown** signaling eliminates the necessity of operating a button or key. When the telephone at the calling station is placed in an off-hook condition, a two-second spurt of ringing is applied to the called station(s).
- (3) **Voice-call** signaling using a loudspeaker signaling, has limited application because of room noise limitations at the customer location. (Loudspeaker circuits are used extensively at “Junk Yards”.) With this arrangement, the called party is summoned to the telephone by means of a loudspeaker. In the multipoint application, the loudspeakers are bridged on the circuit so all stations can hear the calling party.
- (4) **Code selective ringdown** signaling permits stations on the circuit to selectively signal any other station or group of stations on the circuit by operating the signal button or key a predetermined number of times.
- (5) **The SS-IA Selective Signaling System** permits stations at the same location to signal each other as well as distant points on the circuit. It uses two-digit codes with a possibility of 81 codes. The digit one (1) is not assigned in any combination. If an erroneous first digit is dialed, the digit one is used to cancel the first digit. The system applies a busy signal to all stations until the second digit is dialed or until a 6-second time out interval has occurred.



# DATA SERVICES

## Data-Phone®

DATA-PHONE® service provides a means of transmitting data using local and DDD switching facilities. Calls are completed in the same manner as are regular telephone calls. DATA-PHONE® service permits the customer to dial the desired number; the called party answers and the calling party states he is ready to send or receive data.

DATA-PHONE® data sets may be used with customer-owned business machines or telephone-company-provided terminals.

It is of the utmost importance that all trouble reports on DATA-PHONE® services be given special handling in order to effect prompt restoration of service.

## Dataspeed Equipment

DATASPEED equipment is used to communicate information in data language over telephone lines at high speeds. Various models of this equipment are available and differ primarily in transmission speed. DATA-PHONE data sets automatically convert information generated by a computer into tones suitable for transmission over telephone lines. A number of different series of DATA-PHONE data sets is available for use with different kinds of data generating equipment. All DATA-PHONE data sets permit alternate voice communications for coordinating purposes.

## Data Equipment

DATA EQUIPMENT is offered by the telephone company to help in transmitting nonvoice communications. Teletypewriters, which are used to send and receive alphabetic and numeric information, are one group of data equipment. Information can be transmitted as it is typed, or it can be held temporarily on punched paper or magnetic tape and then transmitted at high speed. Both exchange and private lines

are used. Several models of teletypewriters are available. These models differ in their speed of operation and in the degree to which various functions can be performed automatically.

## **Data Coupler**

Data coupler provides the means for connecting the customer-provided data equipment to the switched network (DDD) for data and voice communication.

## **Private-Line Data Services**

The private-line services provide channels of fixed configuration connecting 2 or more points each. Switching arrangements are often custom-engineered; many channels are used with no switching of any sort. Channels are available for the transmission of digital data in various formats at speeds up to the mega-bit-per second range. Channels are also available for the transmission of analog signals at a wide range of speeds.

# TIE LINES

Tie Lines are services that provide one- or two-way circuit interconnecting two or more PBX or Centrex installations. Tie lines can be either manual, dial or dial repeating.

Extensions in PBX's and Centrex's can call each other through the tie line by dialing the *tie line access number* and the desired extension number.

## TIE LINE ACCESS NUMBER

In order to dial an extension in another PBX or Centrex that is connected by a tie line, you first have to dial an access number like "62" or "8". (An access number is like the "9" that is used to get Central Office dial tone.)

## TIE LINE IDENTIFICATION NUMBER

(Circuit Number)

This is the number the customer gives when reporting trouble. These numbers identify the cable and equipment involved for the Telephone Company. It looks something like this:

Example: *TL 2205* or *TL 1015*

Some tie line users include Civil Defense, Aviation agencies, U.S. Government, and local municipalities.

The following types of trunks are used to interconnect PBX tie lines:

- (a) **Satellite Tie Trunks** connect a satellite PBX to its main PBX.
- (b) **Nontandem Tie Trunks** are used between two main PBXs which do not have tie trunks to other PBXs. These trunks are primarily intended for connection to PBX stations at both ends but can also be connected to CO trunks and WATS trunks.
- (c) **Tandem Tie Trunks** are used between main PBXs and tandem PBXs which may be connected together in a customer's PBX tie trunk network.
- (d) **Intertandem Tie Trunks** connect tandem tie trunks to other tie trunks at both ends in large PBX tie trunk networks.

## FOREIGN EXCHANGE LINES

A foreign exchange (FX) line permits a customer to appear as a local customer in an exchange area other than that normally serving the geographical area in which the customer is located. Since the FX central office can be located anywhere in the nation, several interoffice facilities may be required to supply service. A customer subscribing to FX service is interested in calling (or receiving calls from) the distant exchange area without involving toll charges.

## WATS LINES

WATS is the abbreviation and service mark for Wide Area Telecommunications Service. The service is furnished by special Central Office access lines that are connected to the nationwide dialing network. (The name has changed since its inception; you may hear it referred to as Wide Area Telephone Service.)

Each line can be arranged for either INWARD or OUTWARD service but not both over the same line.

WATS lines can be terminated in the same way as any exchange central office line, i.e., on a telephone instrument, key telephone, PBX or data set.

WATS is intended for the direct dialing of long distance station-to-station calls only. In some cases WATS lines are trunked to central offices which do not normally serve the geographic area in which the customer is located because the local central office is not equipped to furnish the WATS service contracted. The customer is not charged for the foreign exchange service in these instances.

Some advantages the customer received from WATS include:

- an advance knowledge of basic cost of long distance calling
- one charge per month rather than many separate itemized charges
- many calls at less cost than regular long distance, if used efficiently.

## Inward WATS Lines (Commonly Known as InWATS)

InWATS allows a customer to receive calls from within specified areas at no charge to the originator of the call.

An *inward WATS* customer's telephone number is always 10 digits and has the following format:

800 + NNX + XXX

**800**—Special Area Code (SAC): Identifies the call as inward WATS service.

**NNX**—designates an *Interstate* code. It is a central office type code which represents the terminating WATS NPA for an inward WATS call and the specific principal city switching machine in that NPA arranged to handle this traffic. All *interstate* inward WATS lines in a WATS NPA are served by the same NNX code.

**NN2**—designates an *Intrastate* code. This central office type code identifies the inward WATS number as intrastate service. These codes may be used to represent:

- (1) The entire state
- (2) An NPA in a multiple NPA state
- (3) A particular city within a state
- (4) A particular terminating serving central office within the state.

**XXX**—These digits represent the inward WATS customer's station digits. Inward WATS number series should be blocked to prevent call completion from normal local and toll telephone service. The first three digits of the series (XXX) specify the following:

- (1) The number is an inward WATS number series
- (2) Indicates the "service area" or "band" subscribed to
- (3) Designates the local serving central office for this inward WATS line
- (4) Shows the outpulsing requirements for this serving central office.

**---X**—The last digit of the series. It is used to designate the particular inward WATS customer and start the hunting series when more than one line is provided.

## Outward WATS Line (Commonly Known as OutWATS)

OutWATS is designed for the customer who originates a large volume of calls outside his normal calling area.

The number assigned for outward WATS is a distinct and unique 7-digit number, i.e., 0/1 XY - XXXX.

The **first digit** (0/1) designates the type service with "0" for full business day service or "1" for measured time service. Full time service may be offered in some localities for intrastate service and is designated "0".

The **second digit** (X) provides district location identification or first digit of the rate center. It is reserved for assignment by the individual Bell Operating Company. Usually a different digit is assigned to each state within the Company for unique identification purposes.

The **third digit** (Y) designates the Service Area or band subscribed for by the WATS customer. Numbers 1, 2, 3, 4 and 5 indicate *interstate* service areas. Numbers 7, 8, 9 and 0 are assigned to *intrastate* service areas. The digit 6 is reserved for future interstate application.

The **last four digits** (XXXX) represent the specific billing number for the line. The last four digits combine with the second digit to identify the rate center and complete the identification of the individual WATS line.

# SWITCHED SERVICES NETWORKS

Switched Service Networks (SSN) are used to switch and interconnect private lines and trunks in accordance with standard plans and customer requirements. Switched Service Networks can be adapted to meet the specific needs of the customers for their communications service.

## Common Control Switching Arrangements (CCSA)

A CCSA is a Bell System furnished private switched network service. This service is intended primarily for large industrial customers and government agencies with extensive internal telecommunications requirements. The CCSA provides for interconnection of customer locations via dedicated access lines and intermachine trunks and shared common control switching. CCSA networks are terminated at the customer location by directly-homed telephone sets, data sets, key telephone systems, and main PBXs/Centrexes.

CCSA networks utilize No. 5 crossbar or No. 1 ESS switching machines located on telephone company premises, that may be shared with other private line customers and/or the regular Message Telecommunication System (MTS).

## Service Features

### A. Uniform Numbering Plan

A 7-digit numbering Plan (NNX-XXXX), exclusive of the access code will permit any station user to reach any other station on the network. A single-digit access code "8" has been designated as the standard code to access a CCSA network from a main dial PBX or Centrex station. A typical PBX or Centrex station originating a CCSA network call would dial "8" plus the 7-digit number (8 + NXX-XXXX).

### B. Network-In-Dialing (NID)

Network-In-Dialing (NID) is similar to direct-inward-dialing (DID) provided by Centrex. A dial PBX (Centrex) or a directly terminated network station can be called over the network by dialing the 7-digit number of the called station.



- C. **Manual Service Inward/Outward (MI/MO)**  
Any Key system station or PBX arranged for manual inward service can be called on the network by dialing the 7-digit number of the PBX (or Key system attendant). The attendant then connects the call through to the station or alert the called Key system station user that he has a call. Any manual PBX station user can place a network call through an attendant.
- D. **Network-Out-Dialing (NOD)**  
Network-Out-Dialing is similar to direct outward dialing provided by Centrex service. Any nonrestricted dial PBX (Centrex) or directly terminated network station user can directly dial a network.
- E. **Transfer of Inward Calls**  
On inward calls to dial PBX, Centrex, or manual PBX locations, two types of inward transfer are available (a) call transfer-individual and (b) Call transfer-attendant. The type of transfer provided depends upon the type of transfer provided with the Centrex or PBX Service subscribed to by the customer.
- F. **Audible Tones and Standard Announcements**  
A variety of tones, dial, busy, fast busy, and ring, are used to indicate the status of a call. The switching system provides recorded service announcements such as unassigned or denied codes and dialing instructions.
- G. **Traffic Measurement on Circuit Groups**  
Traffic measurements are automatically made on trunk groups and accumulated at the switching center. Daily totals of incoming and outgoing peg counts and overflows are provided for traffic analysis.
- H. **Automatic Alternate Routing**  
Automatic alternate routing is provided when the network requires it. The originating switching center routes all calls over the first choice trunks as long as any of these trunks are idle. When these trunks are busy, additional calls are routed over second choice (alternate) trunks.
- I. **Optional Off-Net-Service**  
Off-Net service is an optional feature. A network customer may have off-net service as described below.

- (a) Service provided by an off-net access line between a CCSA switching location and an MTS switching machine at a distant location.
  - (b) Service provided by a local off-net access line between CCSA switching location and a central office located within the same exchange.
- J. **Selective Routing Arrangement (SRA)**  
When a customer requires off-net service using local or foreign exchange facilities, a selective routing arrangement is always required. This feature sorts out the off-net traffic and routes it to the appropriate local or foreign exchange facilities together with any additional information required to complete the call.
- K. **Route Advance Sequence (RAS)**  
Route advance provides the capability for an on-to off-network call to automatically advance from a first choice route to a predetermined series of up to three routes before reaching a "no circuit" condition.
- L. **Automatic Message Accounting (AMA) Sampling**  
CCSA AMA sample data is collected at the originating network switch or Centrex for use by the various telephone companies for communications engineering purposes. The data is also used for identifying problem areas on the customer network. Certain troubles that are difficult to locate or that may go undetected are often found by analyzing AMA sample data.
- M. **Data Transmission**  
CCSA networks should provide a data handling capability when the same type of circuit configurations are compared and the CCSA design considerations and requirements are met.
- N. **International Calling**  
CCSA networks are not presently arranged to permit automatic off-network overseas dialing. When a CCSA network has multiple Canadian points, network calls must be screened at the originating location to preclude the possibility of a call being made from one Canadian location to another off-net location using the CCSA network within the United States.

# Federal Telecommunications System (FTS)

FTS is a switched services network contracted for the General Services Administration (GSA). It is designed for the use of civil agencies of the Federal Government. Some of the features include:

- (1) For manual operation or assistance, all traffic to FTS is routed through a GSA operator location (main PBX on access lines).
- (2) Station User Dialing
- (3) Network Inward Dialing
- (4) Network Outward Dialing
- (5) Uniform dialing arrangements are provided for all customers, with only one telephone number for each station.
- (6) Off Network Access Line - permits completion of calls via the FTS network to scattered government stations not arranged for direct connection to the network
- (7) The FTS Network has a standard 7 - and 10 - digit numbering plan that is compatible with the Bell System's DDD numbering plan. The basic numbering arrangements are as follows:
  - (a) The existing DDD network area code and telephone number is used in completing calls to Centrex installations.
  - (b) The area and central office code of a non-Centrex PBX is followed by a 4-digit station number when completing on an FTS Network In-Dialing (NID) basis. If the PBX has 2- or 3-digit operation, 2 or 1 digits may be prefixed to the present station number.
  - (c) The message network listed or directory number of a PBX or Centrex is used in the FTS network for connection to the PBX attendant when assistance is required in completing the call. It is also used for those PBXs not arranged for Network Inward Dialing.
  - (d) Access to the network is obtained by dialing a code - such as "8" or "88". The user then dials the desired number.

## Automatic Voice Network (AUTOVON)

AUTOVON is a worldwide switched communications system of end-to-end circuit connections for the Department of Defense (DOD) and certain non-DOD subscribers. AUTOVON provides station-to-station dialing. It will automatically select a direct route for a call, or if no direct trunk route is available, it will select alternate routes. The network is designed to handle the transmission of speech and data. Calls may be originated from stations served through PBXs or stations connected directly to a switching system.

AUTOVON is a dedicated switching system offering a number of service features, some of which are unique to the network. Some of the service features are:

- A. **Class-of-Service**—used to indicate the call privileges specified by the subscriber.
- B. **Line Load Control**—provided to control the originating traffic. The line load control can be preset to allow continual service to customer - designated essential lines during periods of office overload.
- C. **Duplex Operation**—permits accommodation of special communications for simultaneous transmission in both directions, elimination of echoes, and improved signal transmission.
- D. **Provision of Special Features**—provided on an automatic basis under class-of-service control. May also be provided on a selective basis under the user's control.
  - Multilevel Precedence Preemption (MLPP)
  - Automatic Alternate Routine using a polygrid routing plan
  - Off-hook service (for selected users)
  - Automatic and random conferencing (for selected users)
- E. **Special Grade Access Lines and Subscriber Lines**—required for some forms of data secure voice telephoto, and facsimile traffic.

## ALARM LINE SERVICES

Alarm line services are used to protect against trouble conditions such as fire, fumes, gases and burglary. These services are provided by customer-owned detection devices that are connected to telephone company lines.

Alarm systems may be arranged so that an alarm can be originated automatically, manually, and there are arrangements that indicate emergency conditions in distant or remote offices that are unattended.

When trouble conditions exist, the alarm contacts of the detection equipment open and activate the appropriate signals and alarms.

# CIRCUIT DESCRIPTION

The purpose of Bell System Common Language Circuit Identification is to provide a coded designation by which a particular Special Service Circuit may be identified. It requires that this designation be unique, that it be in a form that people can read and obtain meaning from, and that is acceptable for both manual and mechanized procedures.

Two standard formats are provided for the identification of Special Service Circuits.

- a. **Circuit Number Format** (Serial Number)—is used when the circuit cannot be uniquely identified by a telephone number plus extension or trunk code.
- b. **Telephone Number Format**—is used when a circuit can be identified by a unique telephone number plus extension or trunk code.

The following elements are common to both the circuit number and Telephone Number formats:

1. Prefix
2. Service Code
3. Modifier

The **Prefix** is an optional 1 or 2 character code and may be either alpha, numeric, or alphanumeric. The first digit of the prefix number identifies a specific state. The second digit is either a numeric or alpha character. The numeric "0" is used to identify Interexchange Special Services. The numeric digits "1 to 9" and the alpha characters "A to Z" in the second digit of the prefix are used to identify Intraexchange Special Services. (Alpha characters I and O are not allowed.)

Both the alpha and numeric characters are used in the second digit identification of the prefix to allow for the possibility of more than nine (9) districts in any of the five South Central States.

Prefix numbers are assigned to each State and Area.

The use of the prefix is optional, when it is not used, this field is left blank.

The **Service Code** is defined as a two (2)-character Alpha Code used to describe the functional characteristics of a Special Service Circuit. These characteristics include:

- A. **Type of Service**, Signal, Teletype, Voice, Program, Video and Wideband
- B. **Terminations**, Describes the endpoints of a Special Service Circuit, e.g., PBX, DEMARC, CPE, DATA, C.O., STATION, etc.

- C. Use, Provides additional descriptive information about the Service when required to distinguish a specific Service Code from a more general family of codes, e.g., distinguish Homebound (HB) from Private Line (PL).

The Service Code can have a *Modifier*. A Modifier is a two (2) character code; the first will always be alpha, while the second is alpha or numeric. This code is used to indicate whether or not the circuit has been conditioned for data transmission and if it is interstate or intrastate; and it also indicates equipment ownership.

The standard elements of the Circuit Number Format only are:

1. **The Circuit Number or Serial Number** — is a one (1) to six (6) character numeric code assigned by the issuing company and is used to uniquely identify a Special Service circuit by a Service Code within each unique prefix.
2. The use of the *Suffix* is normally used only where it is advantageous to relate a group of circuits having the same Prefix, Service Code and Circuit Number. The Suffix is a 3 character code and shall always be numeric. When the suffix is not used, it shall be left blank.
3. **The Company Assigning Circuit Identification** — is a two (2) or four (4) alpha character code and is used to ensure unique Special Service Circuit Identification between Bell Operating Companies. All Bell System Companies have been assigned two (2)-character codes. Independent Companies have been assigned four (4)-character codes.
4. **The Segment Number** is a one (1) to three (3) alpha or numeric character code. It is used to uniquely identify all segments of multipoint Special Service Circuits. The use of a Segment number is optional: when it is not used, it is to be left blank.

The standard Telephone Number Format elements are:

1. **The Numbering Plan Area (NPA)** is a three (3) character code. This field is used to record the NPA or area code associated with the telephone number of the Special Service Circuit.
2. **The Central Office Unit Code** is a three (3) character code. This field is used to record the central office unit code or NNX of the telephone number of the Special Service Circuit.



3. The **Line Number** is a four (4) character code. This field is used to record the line number code of the Special Service Circuit.
4. **The Extension Number/Trunk** Code is a 5 character code. This field is used when the Special Service Circuit has an extension number associated with its telephone number. When direct inward dialing is provided, the extension number will appear as the line number. If no extension number is used, this field is to be left blank. For those Special Services which have a common telephone number, e.g., a group of one (1)-way outgoing PBX trunk, each trunk is to be identified by a trunk code, instead of Extension Number. Trunk codes may be alpha, numeric or alphanumeric. If no trunk code is recorded, this field is to be left blank.
5. The Segment Number is an optional one (1) to three (3) character code used to uniquely identify all segments of a Special Service Circuit. When the segment number field is not used, it is to be left blank.

## Illustrations

### CKT 10PLNT135 SC 1

PRE FIX	SVC CD	MOD FIER	CKT or SERIAL NUMBER				SUF FIX	ASSGN CO				SEG MENT		
1 2	3 4	5 6	7 8	9 10	11 12	13 14	15	16 17	18 19	20 21	22			
1 0	P L	N T	1 3	5				S C				1		

Circuit Number Format

### CKT 10FTNT 205-833-6878

PRE FIX	SVC CD	MOD FIER	NPA	NNX			LINE NUMBER				EXT. or TRUNK				SEG MENT
1 2	3 4	5 6	7 8 9	10 11	12		13 14	15 16	17 18	19 20	21	22 23	24		
1 0	F T	N T	2 0 5	8 3 3			6 8 7 8								

Telephone Number Format



# Circuit Identification

Service Codes	Description
<b>DATA</b>	
<b>DM</b>	<ul style="list-style-type: none"><li>– <b>Data Multiplex</b> A voice grade channel which is used by a customer other than a communications common carrier to derive several low speed data channels.</li></ul>
<b>MC</b>	<ul style="list-style-type: none"><li>– <b>Data Multiplex Channel</b> A low speed 75- or 150-baud data channel derived from a Data Multiplexer equipped with a Telco furnished multiplexer.</li></ul>
<b>DIGITAL DATA SYSTEM</b>	
<b>DS</b>	<ul style="list-style-type: none"><li>– <b>Digital Data</b> Provides for two or more points of Private Line Digital Data Transmission operating at synchronous data speeds such as 2.4, 4.8, 9.6, and 56 kilobits per second. No alternate voice or voice coordination will be provided with this service.</li></ul>
<b>(DD)</b>	<ul style="list-style-type: none"><li>– <b>Switched Digital Data Access Line</b> Provides switch access for Switched Digital Data transmission operating at synchronous data speeds such as 2.4, 4.8, 9.6, and 56 kilobits per second.</li></ul>
<b>ST</b>	<ul style="list-style-type: none"><li>– <b>Switched Digital Data Trunk</b> Provides a synchronous data channel between digital data switches.</li></ul>
<b>FOREIGN EXCHANGE</b>	
<b>(FX)</b>	<ul style="list-style-type: none"><li>– <b>Foreign Exchange Line (Note 1)</b> Provides a direct connection from a station on a customer's premises to a Central Office other than the one which would normally serve the customer's location.</li></ul>
<b>(FT)</b>	<ul style="list-style-type: none"><li>– <b>Foreign Exchange Trunk (Note 1)</b> Provides a service between a PBX, ACD, turret, Centrex, or a CCSA switcher and a remote Central Office which would normally serve the customer's location.</li></ul>

## **MINIMUM SERVICE CHARGE**

- PZ** — **MSC (Minimum Service Charge) Constructed Circuit**  
Provides a minimum service charge when a single customer has large requirements for Private Service and the Telephone Company has no other requirements in the area. This designation is used to list the contracting customer's initial circuit requirements. This identification also applies when the Constructed Channel and/or service terminals contracted for by the customer are not being used to provide a working service and minimum service charges apply.

- PS** — **MSC (Minimum Service Charge) Constructed Spare Circuit**  
In some cases of special construction, it is necessary for the Telephone Company to construct facilities of a size that may result in the provision of channels beyond the customer's original requirements. When the nonrecoverable investment associated with the constructed spare facilities is included in the MTL (Maximum Termination Liability), these facilities are identified in the Circuit Identification format.

## **MISCELLANEOUS SERVICE**

- AL** — **Alternate Services**  
A circuit that uses common facilities to provide two or more services that the customer elects to use in only one mode at a particular time.
- AN** — **Announcement Service**  
Provides a channel which has access to a recorded announcement system. The Sponsor is other than the Telephone Company.
- EL** — **Emergency Reporting Line**  
Provides for the direct connection of reporting station(s) at designated locations to a central reporting location without access to the message network. The central point may be equipped with individual stations, turrent, or reporting switchboard. *This does not include 911 service.*

- EF**                    — **Entrance Facility**  
 Provides a voice grade channel to extend customer-provided facilities to a premise of the customer or an authorized user where the customer is other than an (OCC) Other Common Carrier. The customer's or authorized user's premises must be located 25 airline miles or less from the point at which the customer-provided communication channel is connected to the Telephone Company entrance facility.
- PG**                    — **Paging**  
 Provides for the transmission of announcements or signals to a loudspeaker(s).
- PA**                    — **Protective Alarm (AC)**  
 Provides a channel for an alarm system in which information is transmitted by means of varying frequencies or tones.
- BA**                    — **Protective Alarm (DC Parallel)**  
 Provides a channel for an alarm system. The alarm points are bridged to the main route or leg.
- SC**                    — **Protective Alarm (DC Serial)**  
 Provides a channel for an alarm system. The alarm points arranged in series.
- RT**                    — **Radio Land Line**  
 Provides a channel used to provide access to radio transceivers.
- RF**                    — **Reference Frequency**  
 Provides a channel for the transmitting of specified reference frequencies.
- RA**                    — **Remote Attendant**  
 PBX service that allows an attendant to perform attendant functions at one or more PBX's that are remote from the attendant location.
- BS**                    — **Siren Control**  
 Provides a channel for the control of a siren or warning system.
- TF**                    — **Telephoto/Facsimile**  
 A service used for the transmission of shades of black and white (telephoto) or (facsimile) signals to one or more locations.

- MT**      —    **Wired Music**  
 Provides for the transmission of either speech or music between two or more locations.
- AU**      —    **Autoscript**  
 Provides a channel for the direct transmission of hand-written information between two or more locations. The channel does not have access to the switched message network.
- BL**      —    **Bells and Lights**  
 Provides for the connection of a Civil Defense Control Center bell and light receiving station and warning system control equipment installed in a telephone company building.
- CS**      —    **Channel Service**  
 Provides a channel which has the capacity of transmitting up to 30 bauds. The channel does not have access to the switched message network.
- VM**      —    **Control/Remote Metering Voice Grade**  
 Provides a channel that connects a central point and remote locations, permitting the central location to selectively measure or control quantities or operations at the remote location. The terminal equipment responds to varying frequencies or tones.
- TC**      —    **Control/Remote Metering Telegraph Grade**  
 Provides a channel that connects a central point and remote locations, permitting the central location to selectively measure or control quantities or operations at the remote locations. The terminal equipment responds to varying direct current conditions.

#### **OTHER COMMON CARRIER (OCC)**

The term "Other Common Carrier" denotes a Specialized Common Carrier (e.g., MCI, RCA, etc.), a Domestic or International Public Record Carrier (e.g., WU), or Domestic Satellite carrier not engaged in

the business or providing public message telecommunications services. *These Service Codes should be used to identify facilities furnished to all Other Common Carriers (OCCs), including the Western Union Telegraph Company, under provision of the OCC tariffs.*

- CB** — **OCC Audio Facilities**  
A one way communications path between two points provided to an Other Common Carrier under applicable tariffs. It is comprised of any form or configuration of physical plant capable of transmission of the human voice and other related broadcast material.
- CC** — **OCC Digital Facility—Medium Speed**  
A communications path provided to an Other Common Carrier under applicable tariffs between two points capable of transmitting digital bit stream at speeds between approximately 2.4 and 56 kilobits per second.
- CH** — **OCC Digital Facility—High Speed**  
A communications path provided to an Other Common Carrier under applicable tariffs between two points capable of transmitting digital bit stream at speeds greater than 1 (one) megabit per second.
- CF** — **OCC Special Facility**  
A communications path provided to an Other Common Carrier under applicable tariffs, comprised of any form or configuration of physical plant, other than a voice grade facility or wire pair facility, for the transmission of communications signals.
- CG** — **OCC Telegraph Grade Facilities**  
A communications path provided to an Other Common Carrier under applicable tariffs. It is comprised of metallic conductors and multiplexing equipment which is capable of transmitting direct current two state ("Mark-space", "binary") signals which will accept and deliver such signals

at the facility terminations and which is appropriate for teletypewriter and dc telegraph operation up to 75 baud.

**CM**

— **OCC Video Facilities**

A one way communications path between two points provided to an Other Common Carrier under applicable tariffs. It is comprised of any form or configuration of physical plant capable of the transmission of video signals of United States standard mono chrome and National Televisions Systems Committee color signals of an approximate bandwidth of 4 MHz.

**CV**

— **OCC Voice Grade Facility**

A communications path provided to an Other Common Carrier under applicable tariffs between two points, comprised of any form or configuration of physical plant capable of and typically used in the telecommunications industry for the transmission of the human voice and associated telephone signals within the frequency bandwidth of approximately 300 to 3000 Hertz.

**CW**

— **OCC Wire Pair Facility**

A communications path provided to an Other Common Carrier under applicable tariffs between two points, comprised of metallic conductors capable of transmitting direct current.

**PRIVATE LINE**

**FD**

— **Private Line Data**

Provides a full-time service for the transmission of data or alternate voice and data only between two or more stations or order equipment. Switching between stations or order equipment may be voice manual, automatic, dial or there may be a no signal condition.

**PL**

— **Private Line-Voice**

Provides a full-time service for the transmission of voice only between two or more stations or order equipment. This service does not contemplate connections with control office lines and provides for termination in the telephone instruments at all service locations. This service is available on a 24-hour-per-day, seven-day-per-week basis. Signaling between stations or order equipment may be voice, manual, automatic, dial, or there may be a no-signal condition.

**PROGRAM SERVICES**

**PT**

— **Local Program Channel**

Provides a unidirectional channel for radio broadcasting. It may be used within an exchange area to connect a location to a point of connection with an interexchange channel or it may be used to connect two locations within an exchange area. It is also used between a studio and transmitter.

**PN**

— **Network Program Channel**

Provides a unidirectional channel for radio broadcasting. It is that section of a thru-channel that interconnects exchanges in which stations or channels in Telephone Company offices are located.

**TELEGRAPH SERVICES**

**MR**

— **Morse Channel**

Provides a channel for the transmission of Morse or similar code.

**TT**

— **Teletypewriter Channel**

Provides a full time fixed layout of telegraph grade facilities (150 baud or less) or equivalent, for use by two or more teletypewriter stations. In some cases, the channels may terminate in a computer port.

**TS**

— **Typesetter**

Provided for the operation of a customer's owned and maintained automatic typesetter equipment.

## TELEPHONE SERVICES

- CP** — **Concentrator Identifier Signaling Pair**  
A service that provides a signaling pair between the originating and terminating end of a Concentrator Identifier System.
- CI** — **Concentrator Identifier Trunk**  
A voice or signaling path between two concentrator identifier terminals, provided to reduce the number of facilities between the Telephone Company office and a remote service location, such as an answering service, by concentrating calls on a small number of facilities while retaining the ability, at the service location, to identify the originating line.
- (TK)** — **Local PBX Trunk**  
Provides a connection from a PBX at a customer's premises and a Central Office which normally serves the PBX location.
- (LS)** — **Local Service**  
Local residential, business, or coin service (POTS), served from its normal serving wire center, requiring the assignment of equipment and/or facilities that are inventoried in the trunk bureau records. This code is provided to allow such assignments to be recorded in a mechanized trunk record keeping system.
- LL** — **Long Distance Terminal Line**  
Provides a direct connection from a telephone station at a customer's location to a toll switchboard.
- LT** — **Long Distance Terminal Trunk**  
Provides a direct connection from a PBX or Centrex at a customer's location to a toll switchboard.
- (ND)** — **Network Data Line**  
Provides a direct connection from a DATAPHONE® set or equivalent on the customer's premises to the Central Office. This Central Office may or may not, for



Telephone Company reasons, be its normal Central Office. This service has access to the DDD network. (See PX for PBX Station Termination.)

- (OP) — **Off Premises Extensions (Note 1)**  
Provides a connection from an extension telephone station to the main station line. The extension telephone is located at the customer's location which is remote from the main station location.
- (OS) — **Off Premises PBX Station Line (Note 1)**  
Provides a connection from a PBX to a station at a location remote from the PBX location.
- (PX) — **PBX Station Line**  
Provides a direct connection from a PBX to a station located on the same premises. *This service is identified only when it has been data conditioned or is terminated in data or teletypewriter equipment. The service will also be identified when it connects to customer provided equipment or facilities.*
- (PP) — **PICTUREPHONE® Line**  
Provides a direct connection from a PICTUREPHONE® station located on a customer's premises to a Central Office which has access to the PICTUREPHONE® network.
- (TU) — **Turret or Automatic Call Distributor (ACD) Line**  
Provides a connection from a PBX or Centrex to a turret or ACD.
- (TR) — **Turret or Automatic Call Distributor (ACD) Trunk**  
Provides a connection from its normal serving Central Office to a turret or ACD. The service may also provide a direct connection from one turret or ACD to another turret or ACD.

- (DL) — **DICTATION LINE**  
Provides a connection between a PBX or Central Office and a dictation device.
  - (SL) — **SECRETARIAL LINE**  
Provides a connection from a Call Answering Board to the bridging point on a subscriber line in a Central Office.
- TIE TRUNKS**
- IT — **Intertandem Tie Trunk**  
Connects two tandem PBXs or Centrex's in a PBX Tie Trunk Network. An intertandem Tie Trunk may be connected to other Tie Trunks at both ends.
  - TL — **Non-Tandem Tie Trunk**  
Provides interconnection between two PBX's or Centrex's. A Non-Tandem Tie Trunk may not be connected to another Tie Trunk at either end.
  - SA — **Satellite Tie Trunk**  
Interconnects a main PBX to a satellite PBX. *When a satellite PBX is involved, this code takes precedence over other tie trunk codes, IT, TA and TL.*
  - TA — **Tandem Tie Trunk**  
Provides an interconnection from a non-tandem PBX or Centrex to a tandem PBX or Centrex. A Tandem Tie Trunk may be connected to another Tie Trunk at one end only. This is not part of a Switched Services Network.
- TWX SERVICES**
- (XL) — **TWX Access Line**  
Provides a direct connection between a TWX station and a Central Office which has access to the TWX switching network.
  - XC — **TWX Concentrator Trunk**  
Provides a transmission path between Western Union TWX Line Concentrators.
  - XS — **TWX Concentrator Signaling Lead**  
Provides a control lead between Western Union TWX line concentrators.

- XM** — **TWX Data Multiplexer**  
Provides a voice grade channel between B1 data terminals used to derive TWX Data Trunks.
- XX** — **TWX Data Test Line**  
Provides a channel between equipment in a DDD or TWX office and the automatic data test line equipment.
- XD** — **TWX Data Trunk**  
Provides a narrow band channel between TWX switchers.
- XT** — **TWX Trunk**  
Provides a voice grade channel between TWX switchers.
- VIDEO SERVICES**
- VC** — **Community Antenna Television**  
Provides a video cable distribution system for a Community Antenna Television Company.
- VE** — **Education Television**  
Provided under special tariff for education network services without network protection.
- VI** — **Industrial Television**  
Provided without network protection for nonbroadcast customers.
- VT** — **Local Video**  
Provides unidirectional channels for video and audio transmission in connection with television broadcasting. A local video channel may be used within an exchange area, between a station and a point of connection with an interexchange channel. It may also be used between two points within an exchange area or between two locations in separate exchange areas if the mileage is 25 miles or less. It may also be used between a studio and transmitter.

**VN** — **Network Video**  
Provides unidirectional interexchange channels for video & audio transmission in connection with television broadcasting. The service is used when the channel mileage exceeds 25 miles or for multipoint service of any distance.

**VP** — **Pay Television**  
Provides a video cable distribution and metering system for an authorized licensed operator.

### **WESTERN UNION**

These service codes should be used to identify facilities leased to the Western Union Telegraph Company in accordance with provisions of Contracts No. 1 and 2 where those provisions have not been superseded by the OCC tariffs. These codes should not be used beyond the effective expiration dates of Contracts No. 1 and 2.

**WA** — **Western Union Program**  
A facility leased to the Western Union Telegraph Company for program transmission.

**WU** — **Western Union Telegraph**  
A facility leased to the Western Union Telegraph Company for telegraph grade service.

**WV** — **Western Union Voice Channel**  
A facility leased to the Western Union Telegraph Company suitable for voice transmission.

**WK** — **Western Union Wideband Channel**  
A facility leased to the Western Union Telegraph Company for broader than voice band transmission.

**WG** — **Western Union Teletypewriter**  
A facility leased to the Western Union Telegraph Company for voice frequency carrier systems.

- WT** — **Western Union Facsimile**  
A facility leased to the Western Union Telegraph Company for facsimile transmission.

### **WIDEBAND SERVICES**

- (DE)** — **DATAPHONE® 50**  
Provides for the transmission of wideband data over Telephone Company facilities. A switched 50 kilobits per second data service.

- DH** — **Digital Service**  
Provides for two point private line digital data transmission operating at speeds greater than 1 (one) megabit per second. No alternate voice or voice coordination will be provided with this service.

- FW** — **Wideband-Channel**  
Provides a channel which is the total equivalent of six or more voice grade channels.

**Note 1:** When an OCC is involved, these Service Codes may use the Serial Number Format at the station or closed end.

**Note 2:** These circuits must be identified in the Message Trunk format (BSP 795-400-100).

### **WATS SERVICE**

- (WX)** — **WATS Line (IN)**  
A service which connects a station to a WATS Central Office. INWATS lines are used exclusively for incoming, bulk rate calls from specified locations to the station.

- (WO)** — **WATS Line (OUT)**  
A service which connects a station to a WATS Central Office. Out WATS lines are used exclusively for outgoing, bulk rate calls from the station to specified locations.

- (WZ)** — **WATS Line (2-Way)**  
Connects a station to a WATS Central Office. A 2-way WATS line provides for bulk rate 2-way calling to and from specified locations and the station.

- (WI) — **WATS Trunk (IN)**  
Provides a connection from a PBX, CCSA switcher, turret, or Centrex to a WATS Central Office. INWATS Trunks provide inward, bulk rate, one-way calling from specified areas to the PBX, CCSA switcher, turret, or Centrex.
- (WS) — **WATS Trunk (OUT)**  
Provides a connection from a PBX, CCSA switcher, turret, or Centrex to a WATS Central Office. OUTWATS Trunks provide outward, bulk rate, one-way calling to specified areas from the PBX, CCSA switcher, turret, or Centrex.
- (WY) — **WATS Trunk (2-Way)**  
Provides a connection from a PBX, CCSA switcher, turret, or Centrex to a WATS Central Office. Two-way TRUNKS provide inward and outward, bulk rate, calling to and from specified areas and the PBX, CCSA switcher, turret, or Centrex.

**Footnote:** ( ): = Telephone number format must be used.

# **GLOSSARY OF TERMS**

## **ACCESS CODE**

By dialing a designated digit extensions gain access to various types of lines, such as "9" for central office dial tone, "82" for WATS lines etc.

## **ACCESS LINE**

A telephone line connected to the customer's premise to either establish or receive calls to or from a particular service Area.

## **ADD-ON**

A station user can add another station line, within the PBX, to another existing incoming exchange network call to establish a 3-party conference, without attendant assistance, by flashing the switchhook after utilizing the Consultation Hold feature (Similar to 3-Way calling.)

## **ALPHA**

A term used to indicate alphabetical characters as differentiated from numerical.

## **ALPHANUMERIC**

A contraction of alphabetic-numerical.

## **APARTMENT HOUSE**

A circuit with voice grade between a central office and a customer's location. Used for security in multi-dwelling locations.

## **ATTENDANT CAMP-ON**

This service feature allows an incoming call completed by the attendant to a busy station to be held waiting and then to be automatically connected when the called station becomes idle.

## **ATTENDANT CONFERENCE**

This feature allows an attendant to establish a conference connection, through the switching equipment, of up to five stations or tie trunks or with any four stations or tie trunks and a central office trunk plus the attendant.

## **ATTENDANT DSS WITH BUSY LAMP FIELD**

This service feature allows an attendant at a console to complete a call to a station by operating a single pushbutton associated with that station. This service feature also provides the attendant with visual indication of the busy or idle condition of stations at all times.

**ATTENDANT LOOP**

One of a group of circuits that provides access between the switching network and attendant console(s).

**ATTENDANT POSITION**

The equipment usually a console switchboard or key telephone set, where listed directory number and other calls requiring attendant assistance are answered and completed.

**ATTENDANT TRUNK**

A telephone circuit between a PBX and a PBX station user.

**AUDIO**

Frequencies which can be heard by the human ear (usually between 15 Hz. and 20,000 Hz.)

**AUTOMATIC CALLING UNIT (ACU)**

A dialing device supplied by the communication common carriers which permits a business machine to automatically dial calls over the communications network.

**CABLE**

Assembly of insulated parts of voice conductors in a common protective sheath so arranged as to permit the conductors to be identified. The number of fine gauge conductors in telephone cables may run into thousands.

**CALL TRANSFER**

Individual Incoming CO Calls-This feature allows a station user to transfer an incoming exchange network call to another station within the same PBX system without the assistance of the attendant.

**CALL TRANSFER-ATTENDANT**

This service feature allows a station user, while connected to an incoming call, to signal the attendant and request the attendant to switch the calling party to another station within the same PBX system.

**CALL TRANSFER INDIVIDUAL-ALL CALLS**

This feature enables a station user to transfer any established call. Only one of the parties may be outside the PBX/CTX system.

**CAMP-ON**

Method of holding a call for a line that is in use, and signaling when it becomes free.

**CAMP-ON WITH INDICATION TO BUSY STATION**

Feature which enables an incoming listed number call to a busy station to be held waiting and automatically con-



nected as soon as the called station becomes idle. The busy station receives a spurt of tone to indicate a camped-on call.

### **CATHODE RAY TUBE (CRT)**

A television-like picture tube used in visual display terminals.

### **CENTRAL OFFICE (CO)**

A local Bell Company switching location servicing a geographical area dial tone exchange service and providing an interconnecting point for other Central Offices.

### **CENTREX**

A telephone service for business customers which provides direct inward dialing, identified outward dialing, station-to-station dialing, attendant transfer, and other service features.

### **CENTREX SERVICE**

Is divided into two classes: CTX-CO Line and CTX-CU Line.

### **CTX-CO LINE**

The dial switching equipment is located in a building owned or leased by the Company and the attendant's positions are located on the subscriber's premises.

### **CTX-CU LINE**

Provides a direct connection from a centrex unit located on the customer's premises to a station at the same location.

### **CTX-CU STATION LINE OFF PREMISES**

Provides a direct connection from a centrex unit located on the customer's premises to a station located on the customer's premises remote from the centrex unit location.

### **CHANNEL**

1. A path along which signals can be sent e.g., data channel, output channel.
2. The portion of a storage medium that is accessible to a given reading station e.g., track, band.

### **CHANNEL (COMMUNICATIONS)**

An electrical transmission path among two or more stations or channel terminations in telephone or telegraph company offices, furnished by wire, radio or a combination of both.

### **CIRCUIT SWITCHING**

A system in which station on different circuits within a network are joined by connection of the circuits together.

## **CODE CALL**

Feature which permits a station user to activate a system of calling codes (bells, gongs, lights or horns) by dialing an access code and a called party code. The called party can answer by dialing the answering code.

## **COMMON CARRIER**

A government-regulated company which furnishes public telecommunications facilities such as a telephone or telegraph company.

## **COMPUTER**

1. A device capable of solving problems by accepting data, performing prescribed operations on the data, and supplying the results of these operations. Various types of computers are, calculator, digital computer, or analog computer.
2. In information processing, usually, an automatic stored program computer.

## **CONCENTRATORS**

Equipment used to connect a large number of circuits to a limited number of paths, for example:

Answering Service Concentrators: equipment provided in local central offices which, together with identifying equipment at the answering service location makes it possible to answer a large number of customer lines on a few pairs.

## **CONFERENCE CALLING**

Feature which enables a station user to establish a conference connection with other conferees without the aid of an attendant.

## **CONSULTATION HOLD**

This feature allows a station user to hold an incoming exchange network call and, on the same line, to originate a call to another station within the same PBX system. After consultation the station user may add this station to the original call (ADD-ON) or may return to the original call alone if the second station user hangs up.

## **CROSSBAR**

Dial switching system using mechanism called "Crossbar Switches". These consist of contact spring units operated in coordination by horizontal and vertical members.

## **CROSSTALK**

Cross talk occurs when signals on one telephone circuit appear on another circuit as interference. The circuit

which is the source of the signals is known as the disturbing circuit, and that on which the signals are heard is the disturbed circuit.

## **DATA**

A general term used to denote any or all facts, numbers, letters and symbols, or facts that refer to or describe an object, idea, condition situation or other factors. It connotes basic elements of information which can be processed or produced by a computer. Sometimes data is considered to be expressible only in numeric form, but information is not so limited. Related to (information).

## **DATA-PHONE DATA SET**

A registered trade mark of the A.T.&T. Company to identify the data sets manufactured and supplied by the Bell System for use in the transmission of data over the regular telephone network.

## **DATA-PHONE SERVICE**

Dataphone service provides for alternate voice and data communications between telephone stations in the exchange and toll switched voice message (DDD) network.

## **DATA SET**

A device which performs modulation/demodulation and control functions to provide compatibility between business machines and communication lines for transmission over these lines.

## **DATA SPEED SERVICE™**

Transmission of data from teletypewriters of other business machines which produce punched paper tape is carried over the regular telephone network at 750, 1050, or 1200 words per minute. A registered Trade Mark of the A.T.&T. Co.

## **DATA SPEED 40™SERVICE**

Bell Systems Complete new line of communications devices for private line or switched network applications.

## **DDS**

Data-Phone Digital Service ™ is a trademark of the A.T.&T. Company to identify a private line, interstate service for digital data communications.

## **DICTATION LINE**

A connection between a dial-PBX or central office and a dictation device. May have circuit Service Code DL.

**DIRECT DISTANCE DIALING (D.D.D.)**

A telephone service which enables a user to dial directly telephones outside the user's local area without the aid of an operator.

**DIRECT OUTWARD DIALING**

This service feature allows a PBX station user to gain access to the exchange network without the assistance of the attendant.

**DOWN TIME**

Time when a computer or device is not operating correctly or not in condition to operate correctly due to component failures. The term is in contrast to "up time."

**EMERGENCY REPORTING CENTER TRUNK**

Provides for the direct trunk connection of telephone service to an emergency reporting center-e.g., "911"

**ESS (ELECTRONIC SWITCHING SYSTEM)**

A communications switching system which uses solid state devices and other computer-type equipment and principles. It operates in millionths of a second and gives customers many new services.

**EXCHANGE**

A defined area, served by a communications common carrier, within which the carrier, furnishes service at the exchange rate and under the regulations applicable in that area as prescribed in the carrier's filed tariffs.

**EXCLUSION**

Feature which permits the attendant to talk to either the calling (source) or called (destination) party without either party being in the connection.

**FACSIMILE (FAX)**

Transmission of pictures, maps, diagrams, etc. by wire. The image is scanned at the transmitter and reconstructed at the receiving station.

**FAST BUSY TONE**

A tone interrupted at 120 IPM used to indicate that a requested service is denied, a call has been misdialed, or some other difficulty encountered.

**FOREIGN EXCHANGE SERVICE**

That service which connects a customer's telephone to a telephone company central office not normally serving the customer's locations e.g., a distant city.

## **HOME BOUND**

Circuit Service Code HB. Provides for intercommunication between a student's home, hospital, room, and classroom. This service is furnished for voice transmission and works in conjunction with speaker microphone.

## **IDENTIFIED OUTWARD DIALING**

Feature which automatically identifies the calling station on outgoing toll calls for billing purposes.

## **INDICATION OF CAMP-ON**

This service feature provides an audible signal to a busy called station to indicate that an incoming call is camped on.

## **INWARD RESTRICTION**

Feature which prevents a PBX/CTX station from receiving any incoming calls from the central office.

## **INWARD WATS**

Provides incoming service by means of WATS access lines without charge to the calling party. The call is automatically charged to the called Inwats number that has a special area code "800" number.

## **LEASED LINE**

A customer's private line where only circuitry is provided by the telephone company. (see Private Line)

## **MULTI-STATION**

Any network of stations capable of communication with each other, whether on one circuit or through a switching center.

## **NETWORK**

The interconnection of a number of points by communications facilities.

## **NETWORK, LEASED LINE OR PRIVATE WIRE**

A series of points interconnected by telegraph or telephone channels and reserved for the exclusive use of one customer.

## **NETWORK, PRIVATE TELEGRAPH**

A system of points interconnected by leased telegraph channels and providing hard-copy and/or five-track punched paper tape at both sending and receiving points.

## **NETWORK, PRIVATE TELEPHONE**

A series of points interconnected by leased voice-grade telephone lines, with switching facilities or exchange operated by the customer.

**NIGHT SERVICE**

This service feature allows incoming exchange network calls, normally directed to the attendant, to be answered at preselected PBX stations.

**NUMERIC**

A term referring to data consisting of numbers as differential from alphabetical characters.

**OFF-PREMISE EXTENSION**

A connection from an extension telephone station to the main station line. The extension is located at the customer's location which is remote from the main station.

**OUTWARD WATS**

Provides outgoing service by means of WATS access lines, from a customer's premises to another telephone, within a specified WATS band area.

**PAGING**

A voice grade circuit between two or more customer locations. It is used for the transmission of announcements or signals to a loudspeaker.

**PBX STATION LINE**

A voice grade circuit between a PBX and a station located on the same premises.

**PBX TRUNK**

A subscriber line used as a trunk between a PBX/CTX and the Central Office which serves it. Note: When taken from a PBX point of view the term "Central Office Trunk" may be used in a synonymous sense.

**PICTUREPHONE®**

A registered service mark of the A.T.&T. Company to identify a telephone service that permits the user to see as well as talk with the person at the distant end.

**POWER FAILURE TRANSFER-STATION**

This feature automatically provides outgoing service to the exchange network for a maximum of six prearranged stations during a power failure at the customer location.

**PRIVATE BRANCH EXCHANGE (PBX)**

A switching system providing internal telephone communications between stations located on a customer's premises as well as between these stations and exchange network.

**PRIVATE LINE OR PRIVATE WIRE**

A channel or circuit furnished to a subscriber for his exclusive use. Also called leased line.

**PROTECTIVE ALARM (PA)**

Provides a channel for an alarm system in which information is transmitted by means of varying frequencies or tones.

**RECORDED TELEPHONE DICTATION**

That feature which permits a station user to connect and control the operation of a customer owned dictating machine by dialing a code from the station telephone.

**REMOTE ATTENDANT**

PBX service that allows an attendant to perform attendant functions at one or more PBX's that are remote from the attendant location.

**RESTRICTION FROM OUTGOING CALLS**

This feature denies selected stations within the PBX system the ability to place outside calls and/or certain miscellaneous trunk calls without assistance of attendant.

**SECRETARIAL LINE**

Extension station lines or main telephone lines of patrons of telephone answering bureaus to permit the bureau attendant to answer incoming calls for the patrons.

**SERVICE, TELETYPEWRITER EXCHANGE**

A form of teletypewriter in which suitably arranged teletypewriter stations are provided with lines to a central office where connections may be established between any such stations and any other similar station in the same city or in other cities under control of the subscriber. (See teletypewriter exchange service.)

**SERVICE, TELETYPEWRITER PRIVATE LINE**

A form of teletypewriter service differing from exchange service in that it is limited to service between certain specified stations. The service may be contracted for on a full-time or part-time basis.

**SIGNALING**

In a telephone system, any of several methods used to alert subscribers or operators.

**SPEED CALLING**

That feature which permits station users to place certain 'outside' calls by dialing a pre-assigned 4-digit code.



**SPLITTING**

See "Exclusion."

**STATION-TO-STATION CALLING**

This service feature allows a station user to call another station within the same PBX system without the assistance of the attendant.

**STATION HUNTING**

This service feature allows an incoming call to be directed to one of a prearranged group of stations when the called station is busy.

**SUPERVISION**

A service arrangement which controls the release of central office equipment on incoming and outgoing calls; a visual indication of the status of a call.

**SWITCHED LOOP (ATTENDANT) OPERATION**

A method of operation in which calls are switched to an attendant console when attendant is needed and can be automatically released from the console when work on the call is completed.

**SWITCHING**

Operations involved in interconnecting circuits in order to establish a temporary communication between two or more stations.

**SWITCHING, CIRCUIT OR LINE**

A switching technique where the connection is made between the calling party and the called party prior to the start of a communication (for example, telephone switching). See (circuit switching).

**TELETYPEWRITER EXCHANGE SERVICE (TWX)**

A switched network providing means for interconnecting A.T.&T. teletypewriter subscribers. (Sold to Western Union in April, 1971 and integrated into the Telex network.)

**TELEX**

An automatic teletype exchange service provided by Western Union and extending into Canada via Canadian Pacific Railroad facilities. Subscribers can dial each other for direct two-way teletypewriter communications.

**TELEMETER**

An electric telemeter is the formulating and reformation apparatus for indicating and/or recording the value of a measured quantity at a distance by electrical means.



**TELEMETERING**

The transmission of a measurement over long distances usually by electromagnetic means.

**TELEPAK**

A service offered by communication common carriers for the leasing of wideband channels between two or more points.

**TELEPHONE CONSOLE**

A PBX/CTX attendant's facility operated by means of buttons and equipped with a TOUCH-TONE or rotary dial.

**TELEPRINTER**

Trade name used by Western Union to refer to this telegraph terminal equipment.

**TELEPRINTER EXCHANGE SERVICE**

A service provided by communication common carriers to connect teleprinters. Similar to regular telephone service, customers dial calls from station to station but communicate using teleprinter equipment rather than telephones. See (Telex and TWX).

**TELEPROCESSING**

Trademark used by IBM in referring to their equipment used in the data communications field.

**TELETYPE**

Trademark to the Teletype Corporation. A system for transmitting messages over a distance, employing keyboard or paper tape sending and printed receiving.

**TERMINAL**

1. A point in a system or communication network at which data can either enter or leave.
2. A general term referring to the equipment at the end of a telegraph circuit; modems and associated equipment.

**THREWAY CALLING**

This feature permits a station user to add a third party to any established call.

**TIE-LINE**

A leased communication channel or circuit between two or more PBX's.

**TIME SHARING**

A method of operation in which a computer facility is shared by several users for different purposes at (apparently) the same time. Although the computer actually services each user in sequence, the high speed of the computer makes it appear that the users are all handled simultaneously.

**TOLL CALL**

Any call for a destination outside of the local service area of the calling station.

**TOLL DIVERSION**

Permits extension users to reach a central office trunk and dial outgoing calls to local points without the assistance of the attendant, but prevents them from reaching toll points. Any attempt to dial a point which is denied the station user is routed to the attendant or connected to a special tone.

**TOUCH-TONE CALLING (TTC)**

A station arranged for TOUCH—TONE calling is provided with a telephone set equipped with ten (twelve) pushbuttons corresponding in digits and letters to the ten finger holes in the rotary dial. The station user places the call by operating the buttons.

**TRANSCIVER**

A device which transmits and receives data.

**TRANSMISSION**

The electrical transfer of a signal, message or other form of intelligence from one location to another.

**TRANSMIT**

To move data from one location to another.

**TRANSMITTER**

In telephony, a device to convert sound to electrical energy. In radio and television, a device to generate and radiate electrical energy.

**TRUNK ANSWER FROM ANY STATION**

Incoming exchange network calls, normally directed to the attendant, activate a common alerting signal on the customer's premise when the attendant position is in night service. These calls may then be answered by any station user in the PBX who dials a special code from any nonrestricted station.

**TRUNK (COMMUNICATIONS)**

A trunk is a telephone line or channel, between two central offices or switching devices, which is used in providing telephones connections between subscribers.

**TRUNK CIRCUIT**

A trunk circuit connecting two or more terminals.

**TRUNK LINE**

A telephone circuit between a PBX and a telephone central office.

**TRUNK, TERMINAL**

A trunk circuit connecting two or more terminals.

**UP TIME**

Time a computer is operating free of component failures, plus the time an automatic computer is energized and capable of such operation.

**VOICE CONNECTING ARRANGEMENT**

Permits direct electrical connection of customer-provided voice transmitting and receiving equipment to the telephone network.

**VOICE GRADE CHANNEL**

A channel suitable for transmission of speech digital or analog data, or facsimile, generally with a frequency range of about 300 to 3000 cycles per second.

**WATS**

WIDE AREA TELEPHONE SERVICE.

A service which provides a special line allowing the customer to call a certain zone(s) or band(s), on a direct distance dialing basis, for a flat monthly charge. The continental United States is divided into six bands for the purpose of rates.

WIDEBAND

As applied to data transmission, it is used to denote transmission facilities capable of handling frequencies greater than those required for high-grade voice communications, (i.e., higher than 3 to 4 kc).

