SYSTEM PRACTICE 01651 IMG

BUSINESSCOM PLUS™ 24/ 36/64

Installation and Maintenance Manual

Issue 2-O February 7, 1986

This manual should be read in its entirety before attempting to install or program the system.

This manual has been developed by TIE/communications. Inc. It is intended for the use of its customers and service personnel.

Any comments or suggestions for improving this manual would be appreciated. Forward your remarks to:

TIE/communications, Inc.
5 Research Drive
Shelton, CT 06484

Attention: Manager, Technical Publications

The information in this manual is subject to change. While every effort has been made to eliminate errors, the company disclaims liability for difficulties arising from interpretation of the information contained herein.

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BUSINESSCOM PLUS 24/36/64

REVISION CONTROL

REVISION	DATE	CHANGE
1-0	31 DEC 85	Initial Release of Manual. Software Level B.
2-0	7 FEB 86	Incorporated additional programming conditions in Section 4.

INDEX OF BUSINESSCOM PLUS ILLUSTRATIONS

INDEXOFBUSINESSCOMPLUSTABLES

BUSINESSCOM PLUS 24/36/64
ELECTRONICKEYTELEPHONESYSTEMS
INTRODUCTION

Section 1, SYSTEM DESCRIPTION, introduces the reader to the system. Section 1 contains general descriptive information about the system components, and details the telephone company, site and FCC requirements. It also includes a specification table.

Section 2, FEATURES, provides a detailed description of every feature available in the system. Additional data on key callouts, flash and signaling patterns, and display messages is also included.

Section 3, HARDWARE CONFIGURATION, allows the reader to develop the Order Sheet. The Order Sheet is used to record the equipment (hardware) requirements of the installation site.

Section 4, SOFTWARE CONFIGURATION, consists of the instructions necessary to configure the system programmable options. The data base developed in this section is entered on the Program Record Form (Appendix A). The codes on the Program Record Forms are entered into system memory during installation.

Section 5, INSTALLATION, includes all the information required to successfully install the system.

Section 6, INSTALLATION OF OPTIONAL EQUIPMENT, contains description and installation data on each piece of optional equipment that can be used with the system.

Section 7, PROGRAMMING, tells the reader how to enter the data base recorded on the Program Record Forms into system memory. All systems must be programmed to some degree before being operational.

Section 8, MAINTENANCE, is the final section of the manual and provides maintenance instructions for the system.

Appendix A contains the Program Record Form.

Appendix B contains the Operational Specifications.

Appendix C contains information on the Off-Premises Extension.

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BUSINESSCOM PLUS 24/36/64

ELECTRONICKEYTELEPHONESYSTEMS

SECTION 1, SYSTEM DESCRIPTION

CONTENTS PAGE

1. INTRODUCTION

1.01 The System Description Section provides basic information pertaining to the Businesscorn Plus 24 /36/64 family of Electronic Key Telephone Systems.

1.02 This section describes the various components of the system, stations, instruments, specifications, site and FCC / telco requirements.

1.03 Documents which should be used in conjunction with this manual are the User's Guide for the Multibutton Telephone (PN 01651 MBB), the User's Guide for the Executive Display Telephone (PN 01651 EDB), and the User's Guide for the attendant telephone (P/N 01651 ACB).

2. SYSTEMDESCRIPTION

2.01 The Businesscom Plus 24/36/64 use Z80 microprocessors as the main processors and additional processors for tasksharing between the Main Processing Unit and the station Printed Circuit Boards (PCBs). Also used is a space division matrix.

2.02 The Businesscom Plus 24 has a maximum capacity of eight Central Office (CO) lines, six Intercom links and 24 stations. Privacy is provided on all calls.

2.03 The Businesscom Plus 36 has a maximum capacity of 12 CO lines, six Intercom links and 36 stations. Privacy is provided on all calls.

2.04 The Businesscom Plus 64 has a maximum capacity of 24 CO lines, six Intercom links and 64 stations. Privacy is provided on all calls.

KEY SERVICE UNIT AND POWER SUPPLY

2.05 The Key Service Units (KSUs) house replaceable PCBs that control the system. The KSUs are designed for wall mounting.

2.06 The power supply units have input requirements of 117V @ 60Hz and are designed for wall mounting.

TELEPHONES

2.07 The Businesscom Plus 24/36/64 can use any telephone from the Businesscorn Plus family.

2.08 Businesscorn Plus 8, 12, 24 Line Standard telephones (Figures l-l and 1-2) are equipped with speakers to accommodate tone signaling and Intercom voice / tone announcements. Various keys have red Light Emitting Diodes (LEDs) which provide a visual indication of call or feature status. Ten function (DSS) keys are available and can be used as storage bins for Speed Dial and/or Intercom numbers. A slide control is used for speaker volume adjustment. A microphone is standard hardware that permits Handsfree Reply On Intercom (Figure l-1).

2.09 Businesscorn Plus 8, 12, 24 Line Executive Display telephones (Figures l-l and l-2) are equipped with all the features of Standard telephones as well as some extras as detailed in the next paragraph.

2.10 Executive Display telephones are factory equipped with speakerphones. Speakerphones permit two-way handsfree conversations. CO line keys have both red and green LEDs that give a visual indication of CO line status. A liquid crystal display is provided that displays time and date and can be used as a visual indication of CO and Intercom numbers.

2.11 The following lists and describes the Businesscorn Plus family of telephones:

Businesscorn Plus Family of Telephones

Telephone	Description
8TS	Standard 3 Line
12TS	Standard 5 Line
12TDX	Display 5 Line
24TS	Standard 8 Line
24TDX	Display 8 Line
36TS	Standard 12 Line
36TDX	Display 12 Line
64TS	Standard 24 Line
64TDX	Display 24 Line

OPTIONS

Door Chime Box

2.12 Two Door Chime Boxes can be installed to provide signaling from outside the building. Door Chime Boxes do not utilize station positions.

DSS Consoles

2.13 DSS Consoles permit easy and quick access to many features and all stations. DSS Consoles do not utilize a station position.

External Page Zones

2.14 External zones can receive Background Music, CO Audible, Paging, and External Alarm Signals.

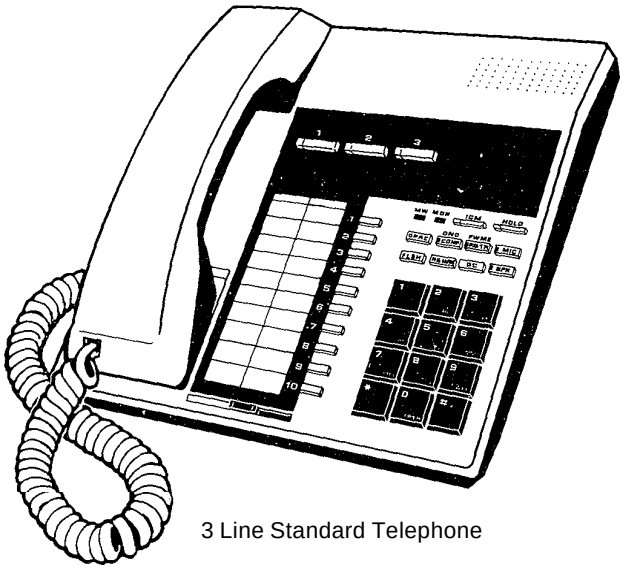
Single Line Telephones (OPXs)

2.15 Single line telephones can be used for locations not requiring key telephones. Single line telephones can be installed on premises or as Off-Premise Extensions (OPXs). Single-line sets can be rotary, pulse (500 type) or DTMF (2500 type), with standard tone or bell ringers. Single line telephones have limited access to certain Businesscom Plus features, including:

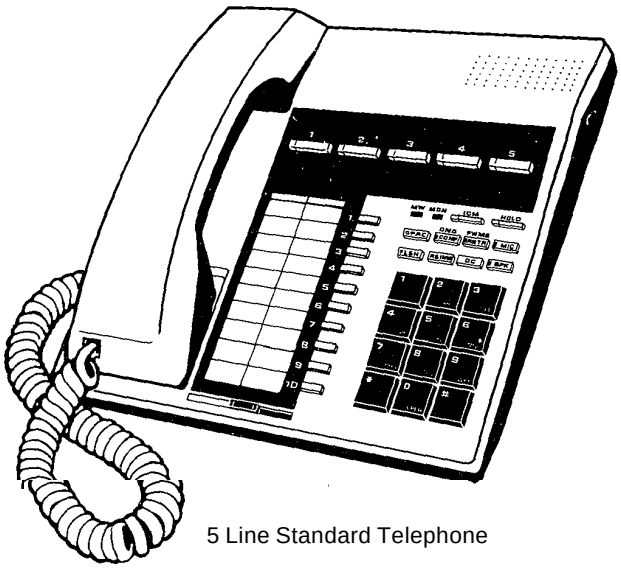
- Intercom features (outbound)
- Ringing Intercom calls (inbound)
- Direct CO Queue Group Access
- Direct CO Line Access
- Pickup of incoming calls and calls on System Hold
- Call Transfer (Screened or Unscreened)
- Incoming CO Audible Assignments
- Toll Restriction

Single line sets require special KSU hardware considerations, and reduce the quantity of key phones in a given system. The maximum number of Single line telephones is approximately half of the system telephone maximum (see Appendix C for details).

NOTE: For simplification, this manual refers to Single line telephones as OPXs, whether or not the single line set is installed off-premises.



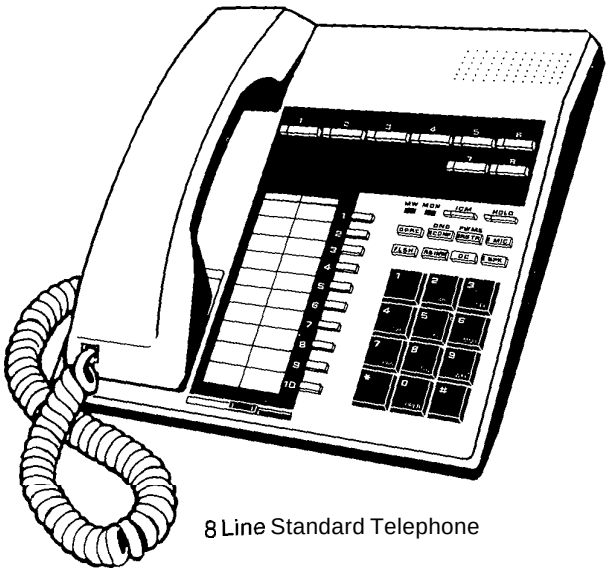
3 Line Standard Telephone



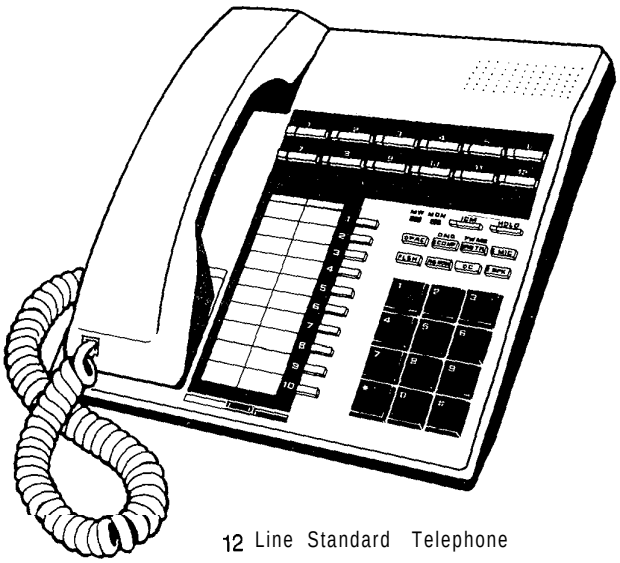
5 Line Standard Telephone

5 Line Executive Display Telephone

Figure I-I **3, 5** LINE STANDARD AND 5 LINE EXECUTIVE **DISPLAY TELEPHONES**



8 Line Standard Telephone

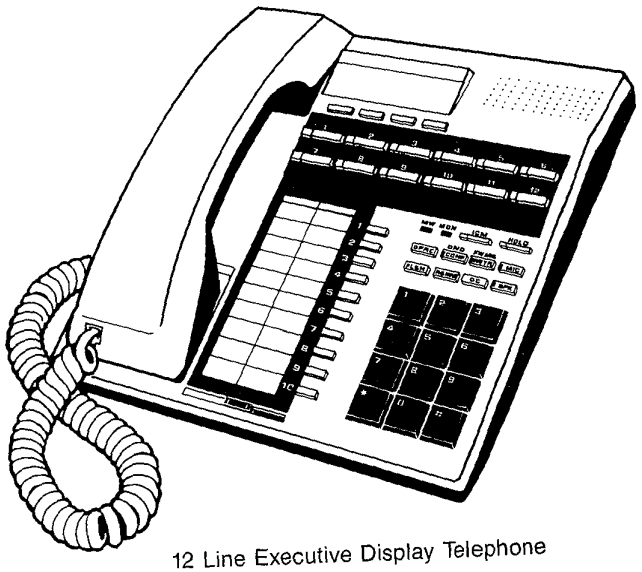


12 Line Standard Telephone

24 Line Standard Telephone

Figure 1-2 **8, 12, 24 LINE** STANDARD TELEPHONES

8 Line Executive Display Telephone



12 Line Executive Display Telephone

24 Line Executive Display Telephone

Figure 1-3 **8, 12, 24** LINE EXECUTIVE DISPLAY TELEPHONES

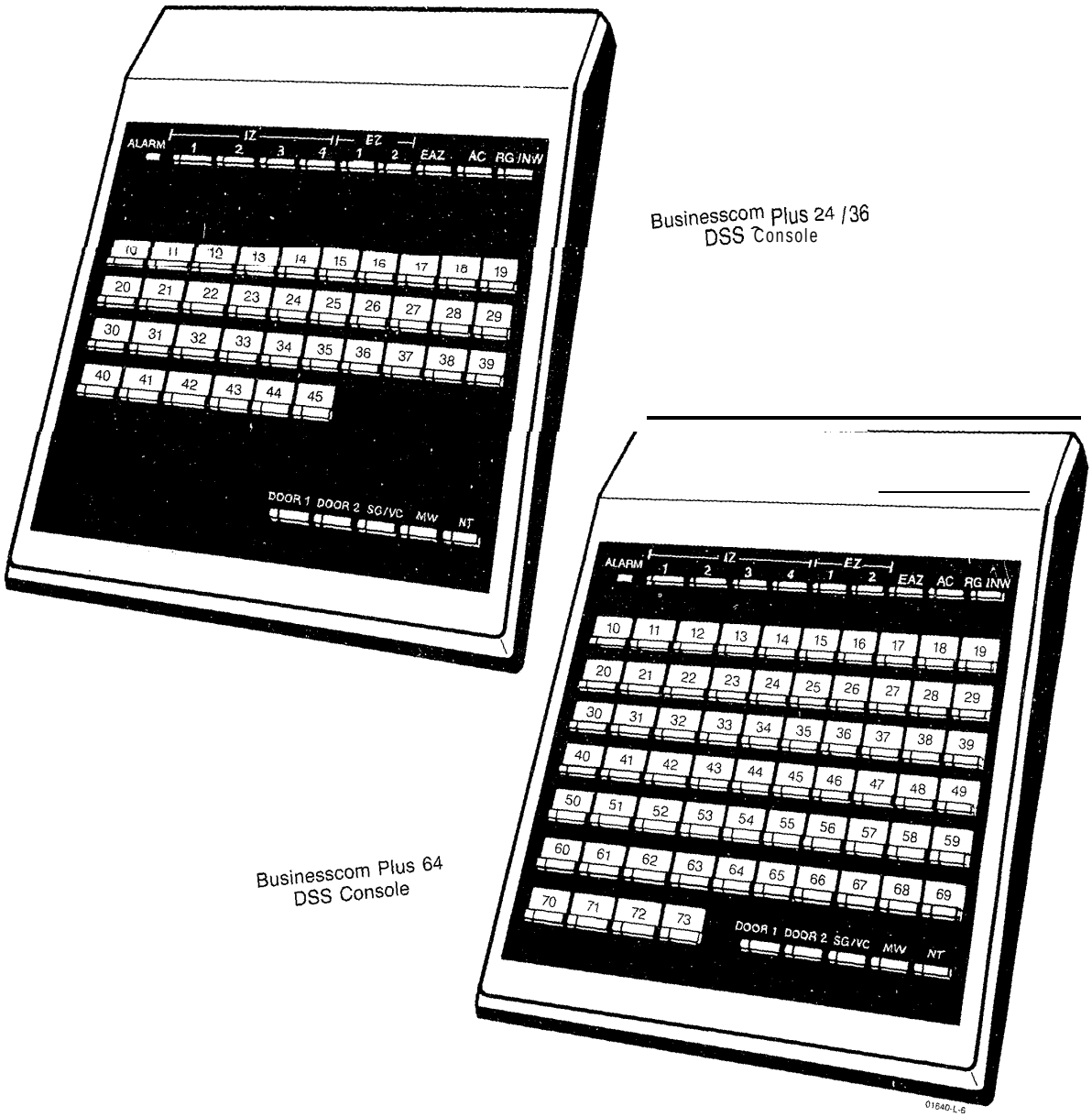


Figure 1-4 DSS CONSOLES

Speakerphones

2.16 Speakerphones, which can be installed in Standard telephones, permit handsfree CO conversations. The maximum number of speakerphones permitted in each system is as follows:

System	Maximum
24	12
36	12
64	24

3. SPECIFICATIONS

3.01 Refer to Tables 1-1, l-2 and 1-3 for technical specifications pertaining to the Businesscom Plus 24/36/64 systems.

4. SITE REQUIREMENTS

4.01 The KSU should be installed in a clean, dry, secure location that prevents access by unauthorized personnel. This location, as detailed in Section 5, should comply with Bell Functional Product Class Criteria of September 1978, in publication PUB 48002 as stated in 3.4.3.2, paragraph C-Indoors With Environmental Control. The room must have adequate ventilation and have a temperature range that does not exceed 32 to 113 degrees F (0 to 45 degrees C) with a 10 to 95% noncondensing, relative humidity.

4.02 The installation site should provide ample room to mount the KSU on the wall along with the necessary connecting blocks and any ancillary equipment. The installation site should not be located in areas subject to static electricity (e.g., dry copiers), vibration (e.g., heavy machinery), or in areas likely to be flooded (e.g., basement level).

4.03 The customer must provide a dedicated NEMA 5-15R outlet with a 117VAC, @ 60Hz and a 15 Amp circuit. A separate earth ground is required in addition to the third-wire ground on the AC circuit. If a music source or optional external paging equipment is installed, it must be connected to an AC circuit other than the system's dedicated AC line. ONLY THE POWER SUPPLY SHOULD BE CONNECTED TO THE DEDICATED AC OUTLET.

5. FCC AND TELCO REQUIREMENTS

5.01 Rules and regulations for the operation and installation of telephone equipment have been established by the Federal Communications Commission (FCC). According to Part 68, "Connection of Terminal Equipment to the Telephone Network" and its amendments, several actions are required before and during the installation of customer-provided telephone equipment. These actions are listed and described in the following paragraphs.

NOTIFICATIONTOTELCO

5.02 As owner of this telephone system, you must give the following information to the operating telephone company (telco) before connecting or disconnecting it:

(1) Sufficient notice of your intention to use privately owned telephone equipment.
(2) The particular lines to be used (telephone numbers xxx-xxxx through xxx-xxxx).
(3) Model: Businesscom Plus 24/36/64
FCC Registration Number: BJ286G-14965-KF-E
Ringer Equivalence: 0.4B
Registered Jack: RJ21X

NOTE: Have telco drop the RJ21X connectors within 25 feet of the installation.

INCIDENCE OF HARM

5.03 If customer-provided equipment is causing harm to the telephone network, the telephone company must, whenever practical, notify the customer that service may be temporarily discontinued. The telephone company must also attempt to inform the customer before actually disconnecting service. The telephone company must provide customers with an opportunity to correct the problem and must advise customers of their right to bring complaint procedures before the FCC.

HEARING AID COMPATIBILITY

5.04 FCC rules prohibit the use of non-hearing aid-compatible telephones in the following locations:

(1) Any public or semipublic location where coin-operated or credit card telephones may be found.
(2) Elevators, highways, and tunnels (automobile, subway, railroad, or pedestrian) where a person with impaired hearing might be isolated in an emergency.
(3) Places where telephones are specifically installed to alert emergency authorities such as fire, police, or medical assistance personnel.
(4) Hospital rooms, residential health care facilities, convalescent homes, and prisons, specifically where telephones are used for signaling life-threatening or emergency situations if alternative signaling methods are not available.
(5) Workstations for hearing impaired personnel.
(6) Hotel, motel, apartment lobbies; in stores where telephones are used by patrons to order merchandise; in public transportation terminals where telephones are used to call taxis, or to reserve lodging or rental automobiles.
(7) Hotel and motel rooms. At least ten percent of the rooms must contain telephones that are compatible with hearing aids or contain jacks for plug-in telephones that are compatible with hearing aids, which will be provided upon request to hearing impaired customers.

6. RADIO FREQUENCY INTERFERENCE

6.01 If the system is not installed and used according to the manufacturer's instructions, this equipment can interfere with radio and television reception. This system is also susceptible to Radio Frequency Interference (RFI) and other forms of Electromagnetic Interference (EMI) from other devices. It has been type-tested and found to comply with the limits for a Class B computing device, according to specifications in FCC Rules covering protection against such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. Interference to radio or television reception caused by this equipment can be determined by turning the equipment off and on. If an interference problem exists, the problem can be solved in one or more of the following ways:

(a) Reorient the receiving antenna.
(b) Relocate the receiver with respect to the equipment.
(c) Plug the equipment and receiver into different branch circuits. The telephone system must be installed on a dedicated AC circuit.

6.02 If necessary, consult your television dealer for additional assistance. The following booklet, prepared by the FCC, can be helpful:

How To Identify And Remove Radio-TV Interference Problems

Order this booklet from:

U. S. Government Printing Office
Washington, D. C. 20402
(Stock No. 004-000-00345-4).

Table **1-1** SPECIFICATIONS, **BUSINESSCOM** PLUS 24

GENERAL SPECIFICATIONS

System Capacity:	MAX. NO.
CO Lines	8
Intercom Talkpaths	6
Key Telephones	24

System Capacity:	MAX. NO.
Speakerphones	12
OPX Telephones	12

ELECTRICAL SPECIFICATIONS

Power Requirements: (AC Supply Must Be Dedicated)

KSU/Power Supply Operating Range: 117 VAC ± 10% 60 Hz ±1 Hz

Power Dissipation:

KSU/Power Supply Unit: 340 Watts @ 2.9 Amp 1160 BTU/HR.

Grounding Requirements:

KSU Ground lug, 14 AWG or larger copper wire to cold water pipe or known good earth ground

Cable Requirements:

Four conductor (two-pair twisted) station wire. 1000 feet (304.8 m) using 24 AWG. 1500 feet (457.2 m) using 22 AWG.
Door Chime Box: 500 feet (152.4 m) using 24 AWG.
Console: 1000 feet (304.8 m) using 24 AWG or 500 feet (152.4 m) if two consoles are used and one is used as a BLF (Busy Lamp Field)

Background Music Specifications:

Input Impedance: 600 OHMS
Input Level: Nominal 250 mV (-10dBm)
Maximum Input: 1 Volt RMS

Limit for Alarm Circuit:

Loop Resistance: 1000 OHMS Max.

Music On Hold Specifications:

Input Impedance: 600 OHMS
Input Level: Nominal 250 mV (-10dBm)
Maximum Input: 1 Volt RMS

External Paging Specifications:

Output Impedance: 600 OHMS
Output Level: Nominal 250 mV (-10dBm)
Maximum Output: 400 mV RMS

MECHANICAL SPECIFICATIONS

Dimensions and Weights:

KSU:	16.8 in.	x 21.5 in.	x 7.8 in.	26.5 lbs.
	430.0 mm	x 550.0 mm	x 200.0 mm	12.0 kg
Power Supply:	12.1 in.	x 14.2 in.	x 4.8 in.	12.8 lbs.
	310.0 mm	x 363.5 mm	x 122.0 mm	5.8 kg
Executive/Key Telephone:	3.1 in.	x 8.0 in.	x 8.6 in.	2.2 lbs.
	80.0 mm	x 205.0 mm	x 221.0 mm	1.0 kg
Door Chime Box:	5.1 in.	x 3.9 in.	x 1.4 in.	0.4 lbs.
	131.0 mm	x 99.0 mm	x 35.0 mm	0.2 kg
DSS Console:	2.0 in	x 7.4 in.	x 8.8 in.	1.3 lbs.
	52.0 mm	x 189.0 mm	x 224.0 mm	0.6 kg

ENVIRONMENTAL SPECIFICATIONS

Environmental Operating Conditions:

Temperature:
KSU and Telephones: 0 to 45 degrees C (32 to 113 degrees F)
Door Chime Box: -20 to 60 degrees C (-4 to 140 degrees F)
Humidity: 10% to 95% noncondensing

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Table 1-2 SPECIFICATIONS, **BUSINESSCOM** PLUS 36

GENERAL SPECIFICATIONS

System Capacity:	MAX. NO.
CO Lines	12
Intercom Talkpaths	6
Stations	36

System Capacity:	MAX. NO.
Speakerphones	12
OPX Telephones	18

ELECTRICAL SPECIFICATIONS

Power Requirements: (AC Supply Must Be Dedicated)

KSU/Power Supply Operating Range: 117 VAC ± 10% 60 Hz ±1 Hz

Power Dissipation:

KSU/Power Supply Unit: 480 Watts @ 4.1 Amps 1638 BTU/HR.

Grounding Requirements:

KSU Ground lug, 14 AWG or larger copper wire to cold water pipe or known good earth ground

Cable Requirements:

Four conductor (two-pair twisted) station wire. 1000 feet (304.8 m) using 24 AWG. 1500 feet (457.2 m) using 22 AWG.
Door Chime Box: 500 feet (152.4 m) using 24 AWG.
Console: 1000 feet (304.8 m) using 24 AWG or 500 feet (152.4 m) if two consoles are used and one IS used as a BLF (Busy Lamp Field)

Background Music Specifications:

Input Impedance: 600 OHMS
Input Level: Nominal 250 mV (-10dBm)
Maximum Input: 1 Volt RMS

Limit for Alarm Circuit:

Loop Resistance: 1000 OHMS Max.

Music On Hold Specifications:

Input Impedance: 600 OHMS
Input Level: Nominal 250 mV (-10dBM)
Maximum Input: 1 Volt RMS

External Paging Specifications:

Output Impedance: 600 OHMS
Output Level: Nominal 250 mV (-10dBm)
Maximum Output: 400 mV RMS

MECHANICAL SPECIFICATIONS

Dimensions and Weights:

KSU:	16.8 in.	x 21.5 in.	x 7.8 in.	33.9 lbs.
	430.0 mm	x 550.0 mm	x 200.0 mm	14.0 kg
Power Supply:	12.1 in.	x 14.2 in.	x 4.8 in.	12.8 lbs.
	310.0 mm	x 363.5 mm	x 122.0 mm	5.8 kg
Executive/Key Telephone:	3.1 in.	x 8.0 in.	x 8.6 in.	2.2 lbs.
	80.0 mm	x 205.0 mm	x 221.0 mm	1.0 kg
Door Chime Box:	5.1 in.	x 3.9 in.	x 1.4 in.	0.4 lbs.
	131.0 mm	x 99.0 mm	x 35.0 mm	0.2 kg
DSS Console:	2.0 in.	x 7.4 in.	x 8.8 in.	1.3 lbs.
	52.0 mm	x 189.0 mm	x 224.0 mm	0.6 kg

ENVIRONMENTAL SPECIFICATIONS

Environmental Operating Conditions:

Temperature:
KSU and Telephones: 0 to 45 degrees C (32 to 113 degrees F)
Door Chime Box: -20 to 60 degrees C (-4 to 140 degrees F)
Humidity: 10% to 95% noncondensing

T1651.1-2

Table H-3 SPECIFICATIONS, BUSINESSCOM PLUS 64

GENERAL SPECIFICATIONS

System Capacity:	MAX. NO.
CO Lines	24
Intercom Talkpaths	6
Stations	64

System Capacity:	MAX. NO.
Speakerphones	24
OPX Telephones	32

ELECTRICAL SPECIFICATIONS

Power Requirements: (AC Supply Must Be Dedicated)

KSU/Power Supply Operating Range: 117 VAC ± 10% 60 Hz ± 1 Hz

Power Dissipation:

KSU/Power Supply Unit: 870 Watts @ 7.4 Amps 2968 BTU/HI=.

Grounding Requirements:

KSU Ground lug, 14 AWG or larger copper wire to cold water pipe or known good earth ground

Cable Requirements:

Four conductor (two-pair twisted) station wire. 1000 feet (304.8 m) using 24 AWG. 1500 feet (457.2 m) using 22 AWG.

Door Chime Box: 500 feet (152.4 m) using 24 AWG.

Console: 1000 feet (304.8) using 24 AWG or 500 feet (152.4 m) if two consoles are used and one is used as a BLF (Busy Lamp Field)

Background Music Specifications:

Input Impedance: 600 OHMS
Input Level: Nominal 250 mV (-10dBm)
Maximum Input: 1 Volt RMS

Limit for Alarm Circuit:

Loop Resistance: 1000 OHMS Max.

Music On Hold Specifications:

Input Impedance: 600 OHMS
Input Level: Nominal 250 mV (-10dBm)
Maximum Input: 1 Volt RMS

External Paging Specifications:

Output Impedance: 600 OHMS
Output Level: Nominal 250 mV (-10dBm)
Maximum Output: 400 mV RMS

MECHANICAL SPECIFICATIONS

Dimensions and Weights:

KSU:	27.8 in.	x 26.1 in.	x 8.5 in.	81.6 lbs.
	713.0 mm	x 670.0 mm	x 219.0 mm	37.0 kg
Power Supply:	13.3 in.	x 19.0 in.	x 4.8 in.	19.4 lbs.
	340.0 mm	x 488.5 mm	x 122.0 mm	8.8 kg
Executive/Key Telephone:	3.1 in.	x 8.0 in.	x 8.6 in.	2.2 lbs.
	80.0 mm	x 205.0 mm	x 221.0 mm	1.0 kg
Door Chime Box:	5.1 in.	x 3.9 in.	x 1.4 in.	0.4 lbs.
	131 .O mm	x 99.0 mm	x 35.0 mm	0.2 kg
DSS Console:	2.0 in.	x 7.4 in.	x 8.8 in.	1.3 lbs.
	52.0 mm	x 189.0 mm	x 224.0 mm	0.6 kg

ENVIRONMENTAL SPECIFICATIONS

Environmental Operating Conditions:

Temperature:
KSU and Telephones: 0 to 45 degrees C (32 to 113 degrees F)
Door Chime Box: -20 to 60 degrees C (-4 to 140 degrees F)
Humidity: 10% to 95% noncondensing

T1651.1-3a

BUSINESSCOMPLUS 24/36/64
ELECTRONIC KEYTELEPHONESYSTEMS
SECTION 2,FEWTURES

CONTENTS PAGE

1. INTRODUCTION

1.01 This section lists and details the features available in the Businesscorn Plus 24/36/64. Both permanent and programmable features are discussed. This section should be used in conjunction with Section 4, SOFTWARE CONFIGURATION, when preparing the Program Record Form.

2. DESCRIPTION

2

2.01 This section is formatted in the following manner:

Description: discusses the basic elements of the feature.

Conditions: lists and describes conditions that limit or enhance the feature under discussion.

Basic Programming: lists required programming, i.e., programming necessary for feature operation.

Related Programming: lists programs that limit or enhance feature operation.

Feature Interactions: lists features that directly affect the feature under discussion.

AUTOMATIC INTERCOM ANSWER

Description:
This feature permits single-step answer of an internal call.

Conditions: None

Basic Programming: None

Related Programming: None

Feature Interactions:
Intercom

BACKGROUND MUSIC (BGM)

Description:
This feature permits station speakers and external zones to receive Background Music.

Conditions:
(a) BGM is a customer supplied item.
(b) BGM can serve as a source of Music On Hold.
(c) BGM is interrupted at a zone and/or station by an incoming call, and at a station by an outgoing call.
(d) BGM is interrupted at stations utilizing Room Monitor.
(e) BGM utilizes one Intercom link.

Basic Programming:
Program 26-Background Music

Related Programming:
Program l&External Paging Output

Feature Interactions:
CO Lines
Hold
Intercom
Music On Hold (MOH)
Room Monitor

CALL DURATION TIMER

Description:
This feature permits a user to time the duration of an outgoing CO call.

Conditions:
(a) This feature is available only on Executive Display telephones.
(b) The timer starts from 0 to 255 seconds after CO line seizure depending upon programming.
(c) This feature can be manually started.
(d) If a Hold is implemented during a CO call, the timer is disabled and the display returns to its normal condition.

Basic Programming:
Program 50—Call Duration Timer

Related Programming:
Program 51—Call Duration Start Timer

Feature Interactions:
CO Lines
Hold

CALL FORWARD WITH FOLLOW-ME

Description:
This feature permits the automatic transfer of an incoming Intercom call to a second station (Call Forward). The destination of the forwarded call can be changed to yet a third station and so on (Follow-Me).

Conditions:
(a) The originating station can change the destination of the Call Forward.
(b) Only the originating station can cancel a Call Forward.
(c) The destination station can change the destination of the Follow-Me.
(d) Program 49 (Excluded System Features) can disable this feature.
(e) A call cannot be forwarded to a station that has invoked DND.
(f) Executive Call Forward overrides Call Forward With Follow-Me.

Basic Programming: None

Related Programming:
Program 49-Excluded System Features

Feature Interactions:
CO Lines
Executive Call Forward
Intercom

CALL MONITOR

Description:
This feature permits the on-hook dialing of an Intercom or CO telephone number.

Conditions:
(a) Telephones without speakerphones must lift the handset to engage in a two-way conversation once the call is established.
(b) The user can also monitor a CO call if placed on Hold.

Basic Programming: None

Related Programming: None

Feature Interactions:
CO Lines
Intercom

CALL PICKUP

Description:
This feature permits a station user to intercept an Intercom call intended for another station.

Conditions:
(a) Program 49 (Excluded System Features) can disable this feature.

Basic Programming: None

Related Programming:
Program 49-Excluded System Features

Feature Interactions:
Intercom

CALL TRANSFER ANNOUNCED

Description:
This feature permits the voice announced transfer of an established CO call.

Conditions:
(a) Voice Announce must be programmed.
(b) Program 49 (Excluded System Features) can disable this feature.
(c) If the transferred call is not answered within a programmed period of time, the call reverts back to the transferring station.
(d) This feature is accessible from a key telephone or DSS Console.

Basic Programming:
Program 24-Voice Announce /Tone Signal Call

Related Programming:
Program 13—DSS Console Port Assignment
Program 38—Call Transfer Timer
Program 39-DSS Transfer Timer
Program 49-Excluded System Features

Feature Interactions:
CO Lines
Direct Station Selection (DSS) Console
Intercom

CALL TRANSFER UNANNOUNCED

Description:
This feature permits the transfer of an established CO call, with ringing, to a second station.

Conditions:
(a) If the transferred call is not answered within a programmed period of time, the call reverts back to the transferring station.
(b) Program 49 (Excluded System Features) can disable this feature.
(c) This feature is accessible from a key telephone or a DSS Console.
(d) Tone Signal must be programmed.

Basic Programming:
Program 24—Voice Announce /Signal Tone Call

Related Programming:
Program 13—DSS Console Port Assignment
Program 38—Call Transfer Timer
Program 39-DSS Transfer Timer
Program 49-Excluded System Features

Feature Interactions:
CO Lines
Direct Station Selection (DSS) Console

CALL WAITING

Description:
This feature permits two types of Call Waiting:
(a) CO Call Waiting.
(b) Intercom Call Waiting.

CO Call Waiting allows a station with a seized CO line to receive ringing for another incoming call on another line.

Intercom Call Waiting allows a station with a seized Intercom link to receive ringing for another incoming Intercom call.

Conditions:
(a) Intercom Call Waiting is unavailable at stations using Handsfree Reply On Intercom.
(b) 'Iwo levels of Intercom Call Waiting are available through programming:
  (1) User-controlled: allows user to initiate the Call Waiting signal.
  (2) Automatic: the Call Waiting signal is automatically initiated.
(c) Callback and Camp-On are unavailable when the automatic mode of Intercom Call Waiting is in use.
(d) Call Waiting (CO) signals are blocked by all levels of Do Not Disturb when Do Not Disturb is in use. Intercom Call Waiting signals are blocked by Do Not Disturb (level 2 and level 3 where LED lights steadily) when Do Not Disturb is in use.
(e) This feature is permanent for Intercom calls with respect to the DSS Console, i.e., the DSS Console has permanent override capabilities.

Basic Programming:
Program 16-CO Call Waiting
Program 23-Intercom Call Waiting

Related Programming ,
Program 13—DSS Console Port Assignment

Feature Interactions:
CO Lines
Direct Station Selection (DSS) Console
Do Not Disturb (DND)
Handsfree Reply On Intercom
Intercom

CALLBACK

Description:
This feature permits a station to receive a signal tone when a previously called busy station resumes an idle condition. If the caller seizes the Intercom link after the signal tone, the idle station is automatically called.

Conditions:
(a) The link must be seized within 20 seconds after the initiation of the Callback signal or the recall is dropped.
(b) Camp-On requests have priority over Callback requests.
(c) Callback cannot be used if the automatic mode of Intercom Call Waiting is programmed.

Basic Programming: None

Related Programming: None

Feature Interactions:
Call Waiting Intercom
Camp-On
Intercom

CAMP-ON

Description:
This feature permits a calling station to wait off-hook for a busy station to resume an idle condition. At this point the idle station is automatically recalled.

Conditions:
(a) Camp-On is unavailable if the automatic mode of Intercom Call Waiting is programmed.
(b) Program 49 (Excluded System Features) can disable this feature.
(c) Camp-On requests have priority over Callback requests.
(d) Camp-On utilizes an Intercom link when in use.

Basic Programming: None

Related Programming:
Program 49-Excluded System Features

Feature Interactions:
Call Waiting Intercom
Intercom

CO LINES

Description:
This feature permits the formation of CO line groups with the option of outgoing and/or incoming access and incoming audible assignment. Lines can be grouped and identified as follows:

Conditions:
(a) Thirty groups are permitted.
(b) Each group can contain as many consecutive lines as required.
(c) Each line can be programmed for either Dial Pulse or DTMF signaling.
(d) Stations assigned line groups with day audible receive audible when Night Transfer is not activated. Stations assigned line groups with night audible receive audible when Night Transfer is activated.
(e) Two CO line groups providing incoming access are assignable on a per station basis.
(f) Two CO line groups providing outgoing access are assignable on a per station basis.
(g) Class of Service and Night Class of Service can be used to prohibit or limit outgoing access.
(h) Audible tone rate is programmable.

Basic Programming:
Program 1-Line Type, Dial Mode, CO Queueing Group
Program 2-CO Line Group Assignments

Related Programming:
Program 6-CO Line Outward Access Assignment
Program 7-CO Line Incoming/Audible Assignment
Program 17—Night Transfer
Program 60—CO Audible Rate Assignment
Program 61—CO Audible Rate Assignment Timer

Feature Interactions:
Night Class of Service
Night Transfer
Toll Restriction

COMMON USE LINE

Description:
This feature permits a CO line to be accessible by any station but subject to that station's Class of Service. It allows both incoming and outgoing access.

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Conditions:
(a) Any line can be used as a Common Use Line.
(b) Access to a Common Use Line can be limited by telephone instrument type.
(c) Common Use Lines are unavailable when Flexible Line Appearance is programmed.

Basic Programming:
Program 3-Common Use Line

Related Programming: None

Feature Interactions:
Flexible Line Appearance

COMPONENT COMMONALITY

Description:
This feature permits the use of different system components in a single system (e.g., any telephone in the Businesscorn Plus Family can be used in any Businesscorn Plus System).

Conditions:
(a) If there are more lines assigned to a telephone than line keys available to accommodate them, a phantom ring can occur For example, if line five has an incoming call and a Businesscorn Plus 3 Line telephone is programmed incoming access and audible for that line, the callrings in but no line key illuminates.† The call can still be answered by lifting the handset or pressing the SPK key provided that Ringing Line Preference is programmed.
(b) A station can queue for a CO line that it has access to, but no line appearance for, if Recall Line Preference (Program 47) is programmed.

Basic Programming: None

Related Programming:
Program 15—Flexible Line Appearance
Program 20—Ringing Line Preference
Program 47-Recall Line Preference

Feature Interactions:
Flexible Line Appearance
Line Queueing
Recall Line Preference
Ringing Line Preference

† Flexible Line Appearance is a feature that "'shifts" lines to different line keys. See Flexible Line Appearance for further explanation.

CONFERENCE, ADD-ON

Description:
This feature permits internal parties to Conference with each other.

Conditions:
(a) Six internal parties can enter the Conference.
(b) Program 49 (Excluded System Features) can disable this feature.

Basic Programming: None

Related Programming:
Program 49 — Excluded System Features

Feature Interactions:
Intercom

CONFERENCE, MEET-ME

Description:
This feature permits selected stations to Conference with a Paging station.

Conditions:
(a) Five stations can Conference with the page initiator.
(b) The initiating station can use Internal Zone Paging or All Call Paging to initiate this feature.

(c) If Internal Zone Paging is used, only those stations granted assignment to that Paging group are allowed to Conference.
(d) Only those stations programmed assignment to a Paging group are permitted to join in a Meet-Me Conference, regardless of the Paging feature used to initiate the Conference.
(e) Program 49 (Excluded System Features) can disable this feature.
(f) When Meet-Me Conference is initiated, the zone is made unavailable to others in the system for a period of 30 seconds or until five stations enter the Conference.

Basic Programming:
Program 8—Paging Groups

Related Programming:
Program 49-Excluded System Features

Feature Interactions:
Paging, All Call
Paging, Internal Zone

CONFERENCE, MULTI-LINE

Description:
This feature permits internal parties to Conference with more than one external party.

Conditions:
(a) Six internal parties can Conference with two external parties.
(b) Stations programmed for Executive Override can enter a Multi-Line Conference uninvited provided that the total number of stations in the Conference does not exceed six.

Basic Programming:
Program 30-Multi-Line Conference

Related Programming: None

Feature Interactions:
CO Lines
Executive Override (Barge In)
Intercom

CONFERENCE, UNSUPERVISED

Description:
This feature permits an internal party to establish a Conference between external parties wherein the Conference is maintained after the initiating party hangs up.

Conditions:
(a) Two external parties can engage in Unsupervised Conference.
(b) Multi-Line Conference and Release of Abandoned Calls on Hold must be programmed for Unsupervised Conference to function.
(c) The following station ports must be available, i.e., station card installed, but unterminated:

System	Port
24	18
36	22
64	34

(d) Lines used for Unsupervised Conference must utilize open loop disconnect supervision,
(e) The Conference initiating party can reenter the Conference.
(f) A 600 OHM resistor must be connected across the unsupervised station position. See Section 5, INSTALLATION (Station Cabling and System Connections) for more information.

Basic Programming:
Program &Unsupervised Conference
Program 30-Multi-Line Conference
Program 54-Release of Abandoned Calls on Hold

Related Programming: None

Feature Interactions:
CO Lines
Conference, Multi-Line
Release of Abandoned Calls On Hold

CONFIRMATION TONE

Description:
This feature when enabled produces a signal tone upon a recognized station key depression.

Conditions:
(a) This feature is programmable on a per station basis.
(b) This feature is user activated on a per station basis.

Basic Programming:
Program 8—Confirmation Tone

Related Programming: None

Feature Interactions: None

DIAL PULSE TO TONE (DTMF) CONVERSION

Description:
This feature permits the user activated conversion from Dial Pulse to Tone (DTMF) while placing a CO call.

Conditions:
(a) Dial-Pulse Sender Speed and the Make/Break Ratio are programmable.
(b) Dial Pulse must be programmed.
(c) A Dial Pulse To Tone (DTMF) Conversion can be stored in a Speed Dial number.

Basic Programming:
Program 1—Dial Mode (Dial Pulse)
Program 57—Dial-Pulse Sender Speed
Program 58—Make/Break Ratio

Related Programming: None

Feature Interactions:
CO Lines
Speed Dial

DIRECT INWARD SYSTEM ACCESS (DISA)

Description:
This feature permits an outside caller the ability to dial directly into the system, without attendant intervention. DISA enables access to certain features, extensions and CO lines, (i.e., WATS, FX, OCC, etc.).

Conditions:
(a) A DISA line can be used normally for outgoing calls.
(b) Only features accessible by dialing a code can be accessed by the DISA line.
(c) An unused extension circuit on the B-STU-D PCB must be equipped with a 150 OHM resistor on the AT-AR pair to perform dial tone detection for the DISA line (see INSTALLATION, Section 5).
(d) The line must be programmed as a DISA line.
(e) Incoming calls on the DISA lines must come from telephones that use Tone (DTMF) signaling.
(f) Release of Abandoned Calls on Hold must be programmed.
(g) Music On Hold is heard after dialing is complete unless the called station is busy.
(h) If an incoming CO call is not answered after 60 seconds, the call is dropped.

Basic Programming:
Program 3—DISA Line
Program 8—Instrument Type

Related Programming:
Program 54—Release of Abandoned Calls On Hold

Feature Interactions:
Intercom
Music On Hold (MOH)
Recall Line Preference
Ringing Line Preference

DIRECT STATION SELECTION (DSS)

Description:
This feature permits the storage of Intercom numbers under station DSS keys.

Conditions:
(a) Ten DSS keys are available on telephones.
(b) Numbers for Paging zones and Door Chime Boxes are permitted storage under DSS keys on telephones.
(c) Program 91 must be run following system initialization.
(d) Program 91 erases all user-stored Intercom numbers and replaces them with values 10 through 18 for keys 1 through 9 and 80 for key 10 on telephones.

Basic Programming:
Program 91—Speed Dial Number Initialization

Related Programming:
Program 39—DSS Transfer Timer

Feature Interactions:
Intercom

DIRECT STATION SELECTION (DSS) CONSOLE

Description:
This feature permits quick access to various key system features from a Direct Station Selection (DSS) Console. The following can be accessed:
(a) Call Transfer Announced
(b) Call Transfer Unannounced
(c) DND Override by DSS Console
(d) Door Chime Box
(e) External Alarm Signals to Stations
(f) Hold (System)
(g) Message Waiting
(h) Night Transfer
(i) Paging, All Call
(j) Paging, All External Zone
(k) Paging, External Zone
(l) Paging, Internal Zone

Conditions:
(a) Two consoles are permitted.
(b) The use of either one or two consoles requires one Intercom link only.
(c) Consoles can be assigned to any port through software but no port can have two consoles assigned to it.
(d) A call extended to a station by the DSS Console must be answered within a programmed period of time or the associated DSS Console station is recalled.
(e) Program 55 (DND Override by DSS Console) permits a DSS Console to override a DND condition at another station. DND Override is unavailable at stations using Executive Call Forward.
(f) The DSS Console must be assigned to the associated key telephone software designated port in order to function as a console. If a console is not assigned to a port, it functions as a Busy Lamp Field (BLF) only. If it is assigned to a particular software designated port, it functions as a console and is used in conjunction with the associated telephone.
(g) DSS Consoles have an ALARM LED that indicates alarm status.

Basic Programming:
Program 13—DSS Console Port Assignment

Related Programming:
Program 39—DSS Transfer Timer
Program 55—DND Override by DSS Console

Feature Interactions:
Call Transfer Announced
Call Transfer Unannounced
DND Override by DSS Console
Door Chime Box
External Alarm Signals to Stations
Hold (System)
Message Waiting
Night Transfer
Paging, All Call
Paging, All External Zone
Paging, External Zone
Paging, Internal Zone

DO NOT DISTURB (DND)

Description:
This feature permits the blocking of incoming CO and/or Intercom (ICM) audible and Paging at the initiating station.

Conditions:
(a) Three DND levels are available:
  (1) Incoming CO audible blocked (level 1).
  (2) Incoming CO/ICM audible blocked (level 2).
  (3) Incoming CO audible blocked only or incoming CO/ICM audible blocked (level 3).

(b) DND (level 2) must be programmed for Executive Call Forward to operate.
(c) DND blocks all Paging announcements at the DND initiating station.
(d) A DSS Console (if so programmed) can override DND.
(e) The Secretary of an Executive Call Forward pair can override DND.

Basic Programming:
Program 7—CO Line Incoming/Audible Assignment
Program 8—Do Not Disturb

Related Programming: None

Feature Interactions:
CO Lines
DND Override by DSS Console
Executive Call Forward
Intercom

DO NOT DISTURB (DND) OVERRIDE BY DSS CONSOLE

Description:
This feature permits the override of a Do Not Disturb condition by a DSS Console.

Conditions:
(a) The console cannot override a DND condition at an Executive station in an Executive Call Forward pair if DND is activated at that station.
(b) The console must be programmed port assignment before it can be used to override DND.

Basic Programming:
Program 8—Do Not Disturb
Program 13—DSS Console Port Assignment
Program 55—DND Override by DSS Console

Related Programming: None

Feature Interactions:
Direct Station Selection (DSS) Console
Do Not Disturb (DND)
Executive Call Forward

DOOR CHIME BOX

Description:
This feature permits selected stations access to Door Chime Box functions. The Door Chime Box functions as a door bell and Intercom. When the button is pressed, programmed stations receive chime tones. A two-way conversation is possible.

Conditions:
(a) Two Door Chime Boxes are permitted.
(b) The number of Door Chime Box tones is programmable (two options).
(c) Ten stations can be programmed to receive Door Chime Box tones.
(d) This feature utilizes an Intercom link when in use.
(e) Both Door Chime Boxes cannot be used at the same time.
(f) There are distinctive chimes for the back and front chime boxes.
(g) A telephone or DSS Console can be used to access Door Chime Boxes.

Basic Programming:
Program 12—Door Chime Box

Related Programming:
Program 13—DSS Console Port Assignment
Program 32—Door Chime Box Signal

Feature Interactions:
Automatic Intercom Answer
Direct Station Selection (DSS) Console
Intercom

DUAL HANDSFREE HOTLINE

Description:
This feature permits a station, designated as the Secretary station, to be paired with two other stations, each designated as a Manager station. A Secretary station can simultaneously call both Manager stations.

Conditions:
(a) When one Manager station answers by use of the handset or SPK key, the call to the other Manager station is dropped.

(b) A Secretary station is permitted assignment to more than one pair of Managers.
(c) Four Manager/Secretary pairs are permitted.
(d) This feature is operational only when both Manager stations are idle.
(e) Handsfree Reply on Intercom is permitted at the Manager stations.
(f) The microphone must be on in order to reply.
(g) The system must be programmed for Voice Announce on Intercom (Program 24).
(h) Dual Handsfree Hotline is unavailable at Manager stations if Call Forward with Follow-Me or Executive Call Forward is activated at either or both stations.

Basic Programming:
Program 10—Dual Handsfree Hotline
Program 24—Voice Announce/Tone Signal Call

Related Programming: None

Feature Interactions:
Handsfree Reply on Intercom
Intercom

EXCLUDED SYSTEM FEATURES

Description:
This program permits certain features that are enabled upon initialization to be disabled.

Conditions:
(a) The following are disabled when Excluded System Features is programmed (functions are disabled as groups; any or all groups can be disabled):

Group	Functions
I	Meet-Me Paging, Meet-Me Conference, Call Pickup
II	Call Forward with Follow-Me, Night Transfer
III	Call Transfer Unannounced, Call Transfer Announced
IV	Conference, Add-On
V	Step Calling, Camp-On, Message Waiting
VI	Not Used
VII	Class of Service Override for System Speed Dial Numbers

(b) If Night Transfer is disabled and a DSS Console is used, it retains the ability to activate Night Transfer if Night Transfer is programmed for exclusive initiation.
(c) When Group VII is disabled, stations with Classes of Service 0-6 can access any System Speed Dial number. When Group VII is enabled, stations are restricted from accessing System Speed Dial numbers by their Classes of Service.

Basic Programming:
Program 49—Excluded System Features

Related Programming: None

Feature Interactions:
Call Forward with Follow-Me
Call Pickup
Call Transfer Announced
Call Transfer Unannounced
Camp-On
Conference, Add-On
Conference, Meet-Me
Direct Station Selection (DSS) Console
Message Waiting
Night Transfer
Paging, Meet-Me
Speed Dial (System)
Step Calling

EXECUTIVE CALL FORWARD

Description:
This feature permits the transfer of incoming CO with ringing and Intercom calls, from a station, designated the Executive, to another, designated the Secretary.

Conditions:
(a) Eight Executive/Secretary pairs are permitted.
(b) Any or all Executive stations can be assigned to the same Secretary station.
(c) DND (level 2) must be programmed for the Executive station in order for Executive Call Forward to function.
(d) Dual Handsfree Hotline is unavailable at Manager stations if one or both are using Executive Call Forward.
(e) Executive Call Forward does not forward Paging or Group Hunt.
(f) Executive Call Forward and Ring Transfer cannot be activated simultaneously.
(g) Executive Call Forward overrides Call Forward With Follow-Me.

Basic Programming:
Program 8—Do Not Disturb
Program 9—Executive Call Forward

Related Programming: None

Feature Interactions:
CO Lines
Do Not Disturb (DND)
Intercom

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EXECUTIVE OVERRIDE (BARGE IN)

Description:
This feature permits a maximum of five internal parties to enter an established CO line conversation without a warning.

Conditions:
(a) Stations can enter all external Conference calls uninvited, except Unsupervised Conference.
(b) The maximum number of internal parties allowed in the Conference (by the use of Executive Override (Barge In) and/or a Conference feature) is six.
(c) This feature allows programmed stations to enter Private Line conversations uninvited.
(d) A call on Exclusive Hold cannot be overridden.

Basic Programming:
Program 4—Executive Override (Barge In)

Related Programming: None

Feature Interactions:
CO Lines
Hold, Exclusive

EXTERNAL ALARM SIGNALS TO STATIONS

Description:
This feature permits the integration of various types of signaling devices, such as fire alarms, security alarms, timebells, etc. and includes the transmission of such alarms in the form of coded tone signals to telephones and the external speakers.

Conditions:
(a) Two Alarm inputs are available.
(b) The Alarm circuits produce distinctive tone indications.
(c) The DSS Console has an ALARM LED that indicates Alarm status.

Basic Programming:
Program 18—External Paging Output
Program 28—Alarm Sensor
Program 53—Alarm Signal Tone

Related Programming:
Program 13—DSS Console Port Assignment

Feature Interactions:
CO Lines
Direct Station Selection (DSS) Console

FLASH

Description:
This feature permits a station user to acquire a new dial tone without losing the line in use. The system provides an open loop flash that is programmable for PBX or CO lines along with two Flash timers.

Conditions:
(a) Flash timing ranges from 0.5 to 255 seconds.
(b) A Flash can be stored in a Speed Dial Number.
(c) Flash permits the transfer of an internal PBX call to another PBX extension.
(d) Flash permits the user to access PBX features including transfer.
(e) The CO or PBX determines the Flash timing required.

Basic Programming:
Program 56—Flash Type/Timing

Related Programming:
Program 1—Line Type

Feature Interactions:
CO Lines

FLEXIBLE LINE APPEARANCE

Description:
This feature permits CO line calls to appear on Line keys other than those delegated upon initialization, i.e. CO line calls on line 1 appear on Line key 1 by default. Component Commonality allows Businesscom Plus family telephones to be used interchangeably (i.e., phones from one system can be used with those of another). In such cases, it is often useful to allow CO line calls on one set of Line keys to appear on another set. For instance, a Businesscom Plus 5 Line telephone has five CO Line keys while a Businesscom Plus 3 Line telephone has only three. Programming permits higher numbered lines to appear on lower numbered Line keys (e.g., lines 2, 3 and 4 can be programmed to appear on Line keys 1-3) on a 3 Line telephone.

Conditions:
(a) Only the primary group assigned in Program 7 (CO Line Incoming Audible Assignment) is shifted. The secondary group is ignored.
(b) Program 6 information is erased by the use of this program.
(c) If there are more lines assigned to a telephone than Line keys to accommodate them, a phantom ring can be heard. For example, if line five has an incoming call and a 3 Line telephone is programmed for incoming access (for, say, lines 2-5) and audible, the call rings in but no Line key illuminates. The call can still be answered by lifting the handset or pressing the SPK key provided that Ringing Line Preference is programmed.
(d) A station can queue for a phantom line but must have Recall Line Preference in order to seize the line.
(e) The type of telephone may restrict access to Common Use Lines.

Basic Programming:
Program 2—CO Line Group Assignments
Program 7—CO Line Incoming/Audible Assignment
Program 15—Flexible Line Appearance

Related Programming:
Program 20—Ringing Line Preference
Program 47—Recall Line Preference

Feature Interactions:
CO Lines
Component Commonality
Recall Line Preference
Ringing Line Preference

FLEXIBLE STATION NUMBER ASSIGNMENT

Description:
This feature permits the reassignment of station numbers via software. No hardware changes are required. This feature is provided so that a user may keep the same assigned extension number if the user moves to another location within the scope of the system.

Each system has a specific number of ports available by design. Upon initialization a station number is assigned to each port. That number is the same as the port (e.g., station number 10 is assigned to port 10). There are, however, more station numbers available than ports in the system. The following specifies the station numbers and ports available upon initialization:

System	Station Numbers	Port Numbers	Available Station Numbers
24	10-33	10-33	10-79
36	10-45	10-45	10-79
64	10-73	10-73	10-79

Each port must be assigned a unique station number. If a station number (from the initialized range above) is assigned to another port, a two-step process is necessary. First, assign the station number (e.g., assign station number 20 to port 10). Second, reassign the station number already occupying the port (e.g., reassign station number 10 to port 20). Port 20 is a possible designation. The assignment of station number 20 to port 10 left station number 10 designated to both ports 10 and 20.

Conditions:
(a) A port must be assigned a unique station number.
(b) A port can be assigned any station number between 10-79 through programming.
(c) Only those station numbers assigned to ports appear, in consecutive station number order, on the DSS Consoles.
(d) Ports are programmed for features. If station numbers are reassigned, the features do not travel with the stations, but stay with the port.

Basic Programming:
Program 14—Flexible Station Number Assignment

Related Programming: None

Feature Interactions:
Group Hunt
Step Calling

GROUP HUNT

Description:
This feature permits the formation of hunt groups designated by hunt group numbers. When such a number is dialed, an idle station is sought out sequentially, starting from the first station entered in programming and ending with an idle station or the final station entered. A CO call can be transferred to an idle station in a group by use of Group Hunt Transfer.

Conditions:
(a) Ten groups are permitted.
(b) Eight stations are permitted per group.
(c) A station can be assigned to more than one group.
(d) This is a "terminal hunt" only.

Basic Programming:
Program 11—Group Hunt

Related Programming: None

Feature Interactions:
Group Hunt Transfer
Intercom

GROUP HUNT TRANSFER

Description:
This feature permits the transfer of an established CO call, with or without ringing (announced or unannounced), to an idle station in a hunt group. Hunt groups have group numbers. When a group number is dialed, an idle station in the group is sequentially sought out. The sequence begins with the first station entered into Program 11 (Group Hunt) and ends with an idle station or the final station entered into programming.

Conditions:
(a) Hunt groups must be programmed.
(b) If all stations in the hunt group are busy, the transfer does not proceed.
(c) If the transferred call is not answered within a programmed period, the call reverts back to the transferring station. Program 39 determines the recall time of an announced transfer. Program 38 determines the recall time of an unannounced transfer.

Basic Programming:
Program 11—Group Hunt

Related Programming
Program 38—Call Transfer Timer
Program 39—DSS Transfer Timer

Feature Interactions:
Call Transfer Announced
Call Transfer Unannounced
CO Lines
Group Hunt

HANDSFREE REPLY ON INTERCOM

Description:
This feature permits an internal party to reply handsfree to an internal call.

Conditions:
(a) Station microphone must be enabled.
(b) This feature is unavailable if a signal announced Intercom call is used.
(c) This feature is applicable to key telephones only.

Basic Programming: None

Related Programming:
Program 24—Voice Announce/Tone Signal Call
Program 25—Microphone On/Off

Feature Interactions:
Intercom
Microphone On/Off

HOLD

Exclusive Hold

Description:
This feature permits a Hold condition wherein call retrieval is possible from the Hold initiating station only. If a call on Exclusive Hold is not answered within a programmed period of time, a reminder signal is issued to the Hold initiating station. If the call remains unanswered for the duration of the reminder signal, the Exclusive Hold is changed to a System Hold.

Conditions: None

Basic Programming:
Program 22—Exclusive Hold
Program 35—Exclusive Hold Recall
Program 36—Exclusive Hold Recall Duration

Related Programming: None

Feature Interactions:
CO Lines

System Hold

Description:
This feature permits a Hold condition wherein call retrieval is possible from any station with access to the line on Hold. If a call remains on System Hold for more than a programmed period of time, a reminder signal is issued to the Hold initiating station. If a DSS Console is used, pressing a Door, Paging or DSS station key places an outside call on System Hold.

Conditions:
(a) The recall can be disabled through programming.

Basic Programming: None

Related Programming:
Program 37—System Hold Recall

Feature Interactions:
CO Lines
Direct Station Selection (DSS) Console

INTERCOM

Description:
This feature permits internal station-to-station calling. Voice or signal calling is available through programming.

Conditions:
(a) Six Intercom links are available.
(b) If a CO and Intercom call are simultaneously made to a station, the Intercom call is given answering priority.
(c) DSS Consoles, Room Monitor, Door Chime Box, Callback, BGM and any Paging feature utilize one Intercom link each when in use.
(d) The primary DSS Console has a dedicated Intercom link.
(e) A called station cannot reply handsfree if already on a call.
(f) This feature can be initiated from a key telephone or DSS Console.

Basic Programming:
Program 24—Voice Announce/Tone Signal Call

Related Programming:
Program 13—DSS Console Port Assignment

Feature Interactions:
Automatic Intercom Answer
Background Music
Call Forward with Follow-Me
Call Pickup
Call Transfer Announced
Call Transfer Unannounced
Call Waiting
Callback
Camp-On
CO Lines
Direct Station Selection (DSS)
Direct Station Selection (DSS) Console
Do Not Disturb (DND)
Door Chime Box
Executive Call Forward
Group Hunt
Paging, All Call
Paging, All External Zone
Paging, External Zone
Paging, Internal Zone
Paging, Meet-Me
Room Monitor
Step Calling

LAST NUMBER DIAL

Description:
This feature permits the redial of the last number dialed.

Conditions:
(a) The last DSS key on telephones is reserved as a Last Number Dial key by Program 91.
(b) Last Number Dial is erased when Line Queueing is used.
(c) If a Save or Speed Dial number is stored under DSS key 10, Last Number Dial capability is lost using the DSS key until the storage bin is cleared of the Save or Speed Dial data.
(d) Only manually dialed numbers are redialed. Speed Dial numbers are not redialed.
(e) Last Number Dial data are stored in station memory.

Basic Programming: None

Related Programming:
Program 91—Speed Dial Number Initialization

Feature Interactions:
CO Lines
Line Queueing
Save
Speed Dial

LINE QUEUEING

Description:
This feature permits a user to wait in line for an available CO line. When a line becomes available, the CO line LED flashes and a recall tone is issued to the queueing station.

Conditions:
(a) If a recalled line is not seized within 20 seconds, the queue is dropped.
(b) Eight stations can queue for a line.
(c) If more than eight stations attempt to queue for a line that is included in a queue group, a reorder signal is issued. If a user attempts to queue for a line that is not in a queue group, a reorder signal is issued.
(d) Four groups are permitted.
(e) Line Queueing erases Last Number Dial data.
(f) Stations can queue for lines that they have access to, but do not have line appearance for, if Recall Line Preference (Program 47) is programmed.

Basic Programming:
Program 1—CO Queueing Group

Related Programming:
Program 6—CO Line Outward Access Assignment
Program 15—Flexible Line Appearance
Program 47—Recall Line Preference

Feature Interactions:
CO Lines
Flexible Line Appearance
Recall Line Preference

MESSAGE WAITING

Description:
This feature permits a user to leave a Message Waiting indication (flashing MW lamp) at a busy or unanswered station.

Conditions:
(a) Program 49 (Excluded System Features) can disable this feature.
(b) Message Waiting can be left at several stations by a single station but if the initiator cancels the Message Waiting, all are canceled simultaneously.
(c) Message Waiting indications can be canceled by the receiving station.
(d) This feature can be initiated from a key telephone or DSS Console.

Basic Programming: None

Related Programming:
Program 13—DSS Console Port Assignment
Program 49—Excluded System Features

Feature Interactions:
Direct Station Selection (DSS) Console
Intercom

MICROPHONE ON/OFF

Description:
This feature permits the programmer to change the normally on condition of system microphones that is available upon initialization to a normally off condition. A microphone permits the user to converse with other internal parties on Intercom calls handsfree. The MIC button at each telephone is used to enable or disable the microphone.

Conditions:
(a) When the MIC button LED is illuminated, the microphone is off.

Basic Programming:
Program 25—Microphone ON/OFF

Related Programming: None

Feature Interactions:
Handsfree Reply On Intercom
Intercom

MUSIC ON HOLD (MOH)

Description:
This feature permits an external party to hear music when placed on Hold.

Conditions:
(a) Three selections of MOH are available:
  (1) "Greensleeves"
  (2) "Home on the Range"
  (3) External Source
(b) Background Music is permitted as a source of MOH.

Basic Programming: None

Related Programming:
Program 26—Background Music (BGM)

Feature Interactions:
Background Music
CO Lines
Hold

NIGHT CLASS OF SERVICE

Description:
This feature permits stations programmed for Night Class Service to assume a specific Class of Service when Nig Transfer is activated.

Conditions:
(a) The Night Class of Service is programmed separat from Class of Service.
(b) Night Class of Service supersedes a station's regular Cl of Service.
(c) This feature can be used to prohibit or limit a statio outward access when Night Transfer is activated.

Basic Programming:
Program 8—Night Class of Service
Program 48—Night Class of Service Selection

Related Programming: None

Feature Interactions:
CO Lines
Night Transfer
Toll Restriction

NIGHT TRANSFER

Description:
This feature permits incoming CO audible at static programmed for night audible.

Conditions:
(a) A station must have incoming access to the appropri line to receive Night Transfer calls.
(b) Night audible is programmable.
(c) Programming allows two options of initiation:
  (1) Any station in the system including a DSS Cons can activate or deactivate Night Transfer.
  (2) The system programming station alone can initi Night Transfer. However, if a DSS Console is us only it can initiate Night Transfer.
(d) Stations with night audible receive Night Transfer ca on a priority basis over Ring Transfer calls when bo features are simultaneously in use.

(e) Program 49 (Excluded System Features) can disable this feature. However, if a DSS Console is programmed it retains the ability to access Night Transfer.
(f) Night Class of Service can be used to prohibit or allow a station's outward access. Night Class of Service, if programmed, is enabled when Night Transfer is activated.
(g) If a station other than the system programming station activates Night Transfer, all stations with audible in the same CO group are affected.
(h) This feature can be initiated from a key telephone or DSS Console.

2

Basic Programming:
Program 17—Night Transfer

Related Programming:
Program 2—CO Line Group Assignments
Program 7—CO Line Incoming/Audible Assignment
Program 8—Night Class Of Service
Program 13—DSS Console Port Assignment
Program 48—Night Class of Service Selection
Program 49—Excluded System Features

Feature Interactions:
CO Lines
Direct Station Selection (DSS) Console
Night Class of Service

OFF-PREMISES EXTENSION

Description:
This feature permits the location of a telephone at some site other than where the system proper is located. An Off-Premises Extension (OPX) is a telephone (or any device requiring between −48V to 90V ringing to activate) in a distant location that is connected to the system and has access to all system features that are available to single line telephone users.

Conditions:
(a) A Dial Pulse or Rotary single line set cannot activate a feature using * or #.
(b) Up to 50% of the total station capacities of the Businesscom Plus 24/36/64 can be OPX stations.
(c) The OPX must be provided with a device that can be connected to a normal CO line. Ordinarily, a standard 500/2500 telephone is used as an OPX. However, such devices as an answering machine or a modem may be installed as an OPX.
(d) A B-MFRU PCB is required if a DTMF type OPX is used for DTMF decoding.
(e) Off-Premises Extensions require the installation of optional equipment. (See Appendix C for details.)

Basic Programming:
Program 8—Instrument Type

Related Programming:
Program 1—Line Type, Dial Mode, CO Queueing Group
Program 2—CO Line Group Assignments
Program 3—Common Use Line
Program 6—CO Line Outward Access Assignment
Program 7—CO Line Incoming/Audible Assignment
Program 8—Night Class of Service, Instrument Type
Program 11—Group Hunt
Program 14—Flexible Station Number Assignment
Program 40—Class of Service
Program 41—Permitted Codes
Program 43—PBX Access Codes
Program 44—Common Unrestricted Codes
Program 45—Digit Absorbing
Program 46—Second Digit Restriction
Program 48—Night Class of Service Selection
Program 49—Excluded System Features

Feature Interactions: None

PAGING, ALL CALL

Description:
This feature permits external zones and station speakers to receive Paging.

Conditions:
(a) Stations must be granted Paging group assignment in order to receive All Call Paging.
(b) A double splash tone, if programmed, precedes an All Call Paging announcement.
(c) All Call Paging utilizes an Intercom link when in use.
(d) Do Not Disturb blocks incoming All Call Paging at a given station when activated at that station.
(e) This feature can be initiated fror a key telephone or DSS Console.
(f) Paging is not accessible using DISA.
(g) Two external zones are available.

Basic Programming:
Program 8—Paging Groups

Related Programming:
Program 13—DSS Console Port Assignment
Program 19—All External Zone Paging
Program 52—Paging Splash Tone

Feature Interactions:
Direct Station Selection (DSS) Console
Do Not Disturb (DND)
Intercom

PAGING, ALL EXTERNAL ZONE

Description:
This feature permits external zones to receive All Call Paging.

Conditions:
(a) All External Zone Paging utilizes an Intercom link when in use.
(b) Speakers and amplifiers are customer provided items.
(c) A double splash tone, if programmed, precedes a Paging announcement.
(d) This feature can be accessed from any telephone or DSS Console.
(e) Paging is not accessible using DISA.
(f) Two external zones are available.

Basic Programming:
Program 19—All External Zone Paging

Related Programming:
Program 13—DSS Console Port Assignment
Program 52—Paging Splash Tone

Feature Interactions:
Background Music (BGM)
Direct Station Selection (DSS) Console
External Alarm Signals To Stations
Intercom
Paging, All Call
Paging, All External Zone

PAGING, EXTERNAL ZONE

Description:
This feature permits external zones to receive Paging, BGM, CO audible and External Alarm Signals.

Conditions:
(a) Two external zones are available.
(b) External Zone Paging utilizes an Intercom link when in use.
(c) External zones can receive All Call Paging.
(d) Speakers and amplifiers are customer provided items.
(e) A double splash tone, if programmed, precedes a Paging announcement.
(f) This feature can be accessed from any telephone or DSS Console.
(g) Paging is not accessible using DISA.

Basic Programming:
Program 13—DSS Console Port Assignment

Related Programming:
Program 18—External Paging Output
Program 52—Paging Splash Tone

Feature Interactions:
Background Music
Direct Station Selection (DSS) Console
External Alarm Signals To Stations
Intercom
Paging, All Call
Paging, All External Zone

PAGING, INTERNAL ZONE

Description:
This feature permits four internal page groups. Internal Paging is broadcast through the speaker in key telephones.

Conditions:
(a) A double splash tone, if programmed, precedes an Internal Zone Paging announcement.
(b) Internal Zone Paging utilizes an Intercom link when in use.
(c) Do Not Disturb blocks incoming Internal Zone Paging at a given station, when activated at that station.
(d) A station need not be assigned to a page group but if so assigned, it can be in only one group at any one time.
(e) The number of stations per group is limited only by the maximum allowed number of stations in the system, e.g., 24 stations are permitted per group in a Businesscom Plus 24.
(f) This feature can be accessed from any telephone or DSS Console.
(g) Paging is not accessible using DISA.

Basic Programming:
Program 8—Paging Groups

Related Programming:
Program 13—DSS Console Port Assignment
Program 52—Paging Splash Tone

Feature Interactions:
Direct Station Selection (DSS) Console
Do Not Disturb (DND)
Intercom
Paging, All Call

PAGING, MEET-ME

Description:
This feature permits a party in a paged group to reply to an All Call or Internal Zone Paging announcement.

Conditions:
(a) The paged party must use a station that has access to a page group to respond.
(b) Program 49 (Excluded System Features) can disable this feature.
(c) Meet-Me Paging utilizes an Intercom link when in use.
(d) Do Not Disturb blocks incoming Paging at a given station when activated at that station.
(e) A double splash tone, if programmed, precedes a Meet-Me Paging announcement.

Basic Programming:
Program 8—Paging Groups

Related Programming:
Program 49—Excluded System Features
Program 52—Paging Splash Tone

Feature Interactions:
Do Not Disturb (DND)
Intercom
Paging, All Call
Paging, Internal Zone

PRIVATE LINE

Description:
This feature permits the dedication of a line to a specific station or stations for exclusive use by that station or stations.

Conditions:
(a) Both incoming and outgoing access are available through programming.
(b) Stations programmed for Executive Override (Program 4) can enter a Private Line conversation uninvited.
(c) Any line can be programmed as a Private Line.
(d) The number of Private Lines is limited only by the maximum number of lines permitted in the system, e.g., 3 Private Lines are permitted in a 3 line system, etc.

Basic Programming:
Program 2—CO Line Group Assignments
Program 6—CO Line Outward Access Assignment
Program 7—CO Line Incoming/Audible Assignment

Related Programming: None

Feature Interactions:
CO Lines
Executive Override (Barge In)

RECALL LINE PREFERENCE

Description:
This feature permits single-step seizure of a recalled line.

Conditions:
(a) A recall can be issued by the use of any of the following:
Call Transfer Announced
Call Transfer Unannounced
Exclusive Hold
Incoming DISA calls
Line Queueing
System Hold
(b) Exclusive Hold Recall is programmable.
(c) Stations can queue for CO lines that they have access to, but do not have line appearance for, if Recall Line Preference (Program 47) is programmed.

Basic Programming:
Program 47—Recall Line Preference

Related Programming:
Program 1—Queueing Group
Program 22—Exclusive Hold
Program 35—Exclusive Hold Recall

Feature Interactions:
Call Transfer Announced
Call Transfer Unannounced
Hold
Line Queueing

RELEASE OF ABANDONED CALLS ON HOLD

Description:
This feature permits the release of a CO line when a party that is on Hold on that line hangs up.

Conditions:
(a) Programming permits the system to recognize and drop abandoned calls when opens are detected with-values between:
(1) 20ms — 90ms
(2) 400ms — 600ms
(b) The CO must provide disconnect supervision.
(c) If a PBX is used, it must provide disconnect supervision.
(d) Unsupervised Conference requires this feature.
(e) DISA requires this feature.

Basic Programming:
Program 54—Release of Abandoned Calls on Hold

Related Programming:
Program 22—Exclusive Hold

Feature Interactions:
Hold

REMOTE BUSY LINE INDICATION

Description:
This feature permits the connection of ancillary devic ahead of the key system (i.e., FAX machine, modem, etc When the ancillary device is in use, an LED indication provided to the affected Line key.

Conditions:
(a) If alarm inputs are utilized, four terminations a available for Remote Busy Line Indication.
(b) If alarm inputs are not utilized, six terminations a available for Remote Busy Line Indication.
(c) The remote device must provide a contact closure activate this feature.

Basic Programming:
Program 3—FAX Line

Related Programming:
Program 28—Alarm Sensor

Feature Interactions:
External Alarm Signals to Stations

RING TRANSFER

Description:
This feature permits the automatic transfer of an incoming CO call to a specified station.

Conditions:
(a) Stations with night audible receive Night Transfer calls on a priority basis over Ring Transfer calls when both features are simultaneously in use.
(b) Executive Call Forward overrides Ring Transfer.

Basic Programming: None

Related Programming: None

Feature Interactions:
Night Transfer

RINGING LINE PREFERENCE

Description:
This feature permits single-step seizure of an incoming CO call.

Conditions:
(a) Two types of Ringing Line Preference are available:
  (1) Automatic seizure for stations with both incoming access and audible.
  (2) Automatic seizure for stations with incoming access only.
(b) Line preselection overrides Ringing Line Preference.
(c) Stations can seize a CO call on a line that they have access to, but do not have line appearance for, if Ringing Line Preference (Program 20) is programmed.

Basic Programming:
Program 2—CO Line Group Assignments
Program 7—CO Line Incoming/Audible Assignment
Program 20—Ringing Line Preference

Related Programming: None

Feature Interactions:
CO Lines

ROOM MONITOR

Description:
This feature permits the monitoring of a station's environmental sounds by other stations.

Conditions:
(a) Room Monitor utilizes an Intercom link.
(b) Room Monitor is unavailable to monitoring stations if the monitored station:
  (1) Seizes a CO line or an Intercom link.
  (2) Lifts the handset or presses the SPK key (LED illuminates). The monitor condition returns upon cancelation of the above.
(c) Room Monitor is unavailable to a monitoring station if it:
  (1) Seizes a CO line or an Intercom link.
  (2) Lifts the handset or presses the SPK key (LED illuminates). The monitor condition returns upon cancelation of the above.
(d) Background Music, when in use at a given station, is disabled by the use of Room Monitor at that station.
(e) This feature is only available to key telephones.

Basic Programming:
Program 27—Room Monitor

Related Programming: None

Feature Interactions:
CO Lines
Intercom

SAVE

Description:
This feature permits the storage of a telephone number that can be retrieved for later use. The stored number remains in memory until replaced by a new one.

Conditions:
(a) Program 91 reserves DSS key 9 as a Save storage bin.
(b) Program 91 erases previously stored Save numbers.
(c) If a Save is stored under DSS key 10, Last Number Dial capability is lost when using the DSS key until the storage bin is cleared of the Save data.
(d) The number is stored in system memory.

Basic Programming:
Program 91—Speed Dial Number Initialization

Related Programming: None

Feature Interactions: None

SINGLE STEP ACCESS

Description:
This feature permits the access of an idle CO/Intercom line while the handset is on hook.

Conditions:
(a) Outgoing access must be programmed.

Basic Programming:
Program 6—CO Line Outward Access Assignment
Program 33—Single Step Access

Related Programming: None

Feature Interactions:
CO Lines
Intercom

SPEED DIAL

Description:
This feature permits the quick dialing of selected numbers. Two types of Speed Dial are available: System Speed Dial and Station Speed Dial. System Speed Dial numbers are stored by the system programming station. They can be retrieved by any station in the system. Station Speed Dial numbers are stored by individual stations. They can be retrieved only at the stations where they are stored.

Conditions:
(a) A Flash, Pause, Stop, and Dial Pulse to Tone (DTMF) Conversion can be stored as part of a Speed Dial number.
(b) One hundred telephone numbers are permitted storage as System Speed Dial numbers. Ten telephone numbers are permitted storage as Station Speed Dial numbers.
(c) Program 91 erases all Speed Dial numbers.
(d) Storage bins can be chained.
(e) If a Speed Dial number is stored under DSS key 10, Last Number Dial capability (using the DSS key) is lost until the bin is cleared of the Speed Dial data.
(f) Program 49 (Excluded System Features) can be used to restrict access to System Speed Dial numbers.
(g) Each Speed Dial storage location can contain 18 digits and Flash, Pause, Stop, and Dial Pulse to Tone (DTMF) conversion commands each of which counts as one digit.
(h) OPX stations do not have access to Speed Dial features.

Basic Programming:
Program 91—Speed Dial Number Initialization

Related Programming:
Program 49—Excluded System Features

Feature Interactions:
CO Lines
Dial Pulse to Tone (DTMF) Conversion
Flash

STEP CALLING

Description:
This feature permits a station to search for an idle station in the system.

Conditions:
(a) The search is performed in a sequential fashion, from lowest to highest number.
(b) Program 49 (Excluded System Features) can disable this feature.
(c) If at anytime during the Step Calling the user's station or an unoccupied port is called, a reorder tone is issued and the procedure is halted.

Basic Programming: None

Related Programming:
Program 49—Excluded System Features

Feature Interactions:
Intercom

TENANT SERVICE

Description:
This feature permits two or more users to share a common system.

Conditions:
(a) Each group can have dedicated lines for incoming and outgoing calls.
(b) A total of four Line Queueing groups is permitted. Assignment to the tenant groups is permitted through programming.
(c) Any station can call any other station in the system using the Intercom regardless of tenant group assignment.
(d) A total of four Paging groups is permitted. Assignment to the tenant groups is permitted through programming.
(e) All Call Paging is sent to all stations programmed to receive Paging, regardless of tenant group assignment.
(f) All stations can access System Speed Dial regardless of tenant group assignment.
(g) Night Transfer must be programmed for system-wide initiation if it is to be available to more than one tenant group.

Basic Programming:
Program 6—CO Line Outward Access Assignment
Program 7—CO Line Incoming/Audible Assignment

Related Programming:
All programs that apply to a non-tenant system

Feature Interactions:
All features that apply to a non-tenant system

THREE MINUTE WARNING TONE

Description:
This feature permits the generation of three quick tones every three minutes during an outgoing CO line call.

Conditions:
(a) The tones are issued through the station speaker beginning three minutes after the seizure of a CO line.

Basic Programming:
Program 31—Three Minute Warning Tone

Related Programming: None

Feature Interactions:
CO Lines

TOLL RESTRICTION

Description:
This feature permits programming of restrictive dialing from selected stations. A Class of Service can be assigned to a particular station that prohibits or limits that station's dialing ability.

Conditions:
(a) The following are the available Classes of Service:

COS 0 & 1 - No Restriction.
COS 2 - Can dial Permitted and Common Unrestricted Codes.
COS 3 - Can dial Permitted, Common Unrestricted Codes and 7-digit local numbers.
COS 4 - Can dial Permitted, Common Unrestricted Codes, 7-digit local numbers and 1 + 7 toll numbers.
COS 5 - Can dial Common Unrestricted Codes, 7-digit local numbers and 1 + 7 toll numbers.
COS 6 - Can dial Common Unrestricted Codes and 7-digit local numbers.
COS 7 - Can dial Common Unrestricted Codes.
COS 8 - Can dial ICM calls only.

(b) A Night Class of Service can be assigned to any station. When Night Transfer is activated, the programmed stations assume a Class of Service that overrides the Class of Service designated by Program 40.
(c) Class of Service does not apply to PBX lines with the following qualifications:
  (1) Station users are permitted to dial any 4-digit PBX extension number.
  (2) Station users are permitted to dial any internal PBX operator.

Basic Programming:
Program 6—CO Line Outward Access Assignment
Program 8—Night Class of Service
Program 40—Class of Service
Program 41—Permitted Codes
Program 42—Permitted Code Digits
Program 43—PBX Access Codes
Program 44—Common Unrestricted Codes
Program 45—Digit Absorbing
Program 46—Second Digit Restriction
Program 48—Night Class of Service Selection

Related Programming: None

Feature Interactions:
CO Lines
Night Class of Service
Night Transfer

TRANSFER RECALL DISPLAY

Description:
This feature permits the display of a transferred CO call lin number and the station number to which it is transferre under the circumstances described below. If an incoming C call is transferred to a second station by use of a DS Console, and the transferred call is not answered within programmed period of time, the call reverts back to th associated DSS console station.

Conditions:
(a) An Executive Display telephone must be used.
(b) An Executive Display telephone must be associated wi the DSS Console.
(c) If more than one call returns at a time, the display rotat to show each re-ringing call.

Basic Programming:
Program 13—DSS Console Port Assignment

Related Programming: None

Feature Interactions:
Call Transfer Announced
Call Transfer Unannounced
Group Hunt Transfer

BUSINESSCOM PLUS 24/36/64
ELECTRONIC KEY TELEPHONE SYSTEMS
SECTION 3, HARDWARE CONFIGURATION

CONTENTS PAGE

1. INTRODUCTION

1.01 This section provides the information necessary to order system equipment. It also provides the instructions necessary to fill out the Order Sheet (Table 3-1).

2. DESCRIPTION

2.01 The following paragraphs describe the hardware for the Businesscom Plus 24/36/64 telephone systems.

3. PRINTED CIRCUIT BOARDS

3.01 The following is a description of the PCBs used in the systems.

Central Processor Unit (B-MPU-A)

3.02 The MPU provides Z80 control and contains:

- Three 16K x 8 ROMS
- Two 8K x 8 RAMS
- One write protect circuit
- Sixteen station enable leads
- Six line enable leads
- Two expansion leads
- One 16Hz generator
- One power-on reset circuit to restart MPU
- A battery for memory back-up
- One 4MHz clock
- Several timers
- One LED for confirmation of clock generation

A 3V non-rechargeable Manganese Dioxide Lithium Battery, installed for memory back-up in case of power failure, supports memory for approximately one month after a power failure.

Tone Sender PCB (B-TSU-A)

3.03 The Tone Sender PCB provides the following:

- 400Hz interrupted tone used for Paging splash tones and DSS preemption tones
- 400Hz tone used for ICM dial tone
- ICM busy tone
- ICM fast busy tone
- 800Hz tone used for splash and alarm tones
- Internal MOH generator and switch SW1 to select between internal and external MOH
- Six internal zone paging amplifiers, one for each port
- A daughter board for External Music On Hold, BGM Interface (B-HBU-A) and External Page Interface PCB (B-GCU-A)

Four Station Interface PCB (B-STU-A)

3.04 The Four Station Interface PCB provides interface for:

- Four key telephones and crosspoint matrix for 12 lines, 6 ICM ports and 6 Page ports

Two Station Interface PCB (B-STU-B)

3.05 The Two Station Interface PCB provides:

- Interface for two key telephones

Four Circuit CO Line PCB (B-COU-A)

3.06 The Four Circuit CO Line PCB provides:

- Interface circuitry for four CO/PBX lines
- One DTMF generator and crosspoints for MOH

Each interface circuit contains a ring detect circuit, seize detect circuit, an electronic dial pulse circuit, a muting relay for dial pulse signaling and a negative impedance circuit to compensate for losses on the line.

Two Circuit CO Line PCB (B-COU-B)

3.07 The Two Circuit CO Line Card PCB provides:

- Interface circuitry for two CO/PBX lines that provide interface with the two top ports available

Station Expansion PCB (B-XPU-A)

3.08 The Station Expansion Card provides:

- Crosspoints for lines 13 to 24 and 32 stations

The first expansion PCB is required for access to lines 13 through 24 from the first 32 ports.

A second expansion card is required for access to lines 13 through 24 from ports 33 through 64.

Door Chime Box/DSS Console PCB (B-DDU-A)

3.09 The Door Chime Box/DSS Console PCB provides interface for:

- Two Door Chime Boxes
- Two DSS consoles

OPX Interface PCB (B-STU-D)

3.10 The OPX Interface PCB provides:

- Interface for four single line OPX telephones
- Crosspoints for 12 lines, 6 ICM ports, 6 Page ports

OPX/DTMF Receiver PCB (B-MFRU-B)

3.11 The OPX/DTMF Receiver PCB is a daughter board for the OPX Interface PCB (B-STU-D). It provides:

- Circuitry for DTMF detection from single line or dial-in CO/PBX line

External MOH and BGM Interface PCB (B-HBU-A)

3.12 The External MOH and BGM Interface PCB provides:

- Connections for two alarm sensors
- Connections for customer-supplied MOH and BGM

This PCB is a daughter board for the Tone Sender PCB (B-TSU-A).

External Page Interface PCB (B-GCU-A)

3.13 The External Page Interface PCB provides:

- Two external speaker zone outputs
- Two external speaker zone relay contacts

This PCB is a daughter board for the Tone Sender PCB (B-TSU-A).

Line Protection Unit PCB (B-LPU-A)

3.14 The Line Protection Unit PCB provides:

- Tip and ring fuses for 12 lines
- MOV (secondary lightning protection) for 12 lines

This PCB is needed for the Businesscom Plus 64 only. It must be installed in order to access CO lines. Two boards may be required.

Speakerphone Unit PCB (B-SPDU-A)

3.15 The Speakerphone Unit PCB is standard on Executive telephones but can be ordered separately for Standard telephones.

- Voice switch circuit located on this PCB only

The maximum number of Speakerphones permitted per system is:

System	Max.
24	12
36	12
64	24

4. KEY SERVICE UNIT (KSU)

4.01 The KSU houses the circuit boards for the telephone system. Three KSUs are available: 24 KSU for Businesscom Plus 24 telephone system, 36 KSU for the Businesscom Plus 36 telephone system, 64 KSU for the Businesscom Plus 64 telephone system.

5. POWER SUPPLY

5.01 Two power supplies are available: 24/36 power supply for both the Businesscom Plus 24/36 telephone systems, 64 power supply for the Businesscom Plus 64 telephone system.

6. TELEPHONES

6.01 Two styles of telephones are available: Executive and Standard. The Executive telephone has a liquid crystal display capable of displaying:

- Date/time/month/day
- Incoming and outgoing ICM calls
- Outgoing CO line calls
- Call duration
- Programming data
- Two programmable alarms

In addition to these features are:

- ICM and Hold keys with LEDs
- Ten function keys used for Speed Dial and DSS call
- Message Waiting and Monitor LEDs, MW and MON, respectively
- Speakerphone
- Red and green CO line key LEDs

The Standard telephone has all the features of an Executive telephone except:

- Green CO line LEDs
- Speakerphone (optional)
- Display

For a description of the Off-Premises Extension see Appendix C.

7. DSS CONSOLE

7.01 DSS consoles contain the following:

- DSS keys with LEDs for BLF indications
- Ring-Inward key
- All Call Paging key with LED
- External All Zone Paging key with LED
- Two External Zone Paging keys with LEDs
- Four Internal Zone Paging keys with LEDs
- Night Transfer key with LED
- Message Waiting key with LED
- Signal/Voice Call key
- Two Door Chime Box keys with LEDs
- Alarm LED

Two types of consoles are available:

- 24/36 DSS for both 24/36 systems
- 64 DSS for the 64 system

8. DOOR CHIME BOX

8.01 The Door Chime Box is optional. Two boxes can be used in the system. Door Chime Boxes provide:

- Distinctive ringing tones if two boxes are used
- Intercom call capabilities to Door Chime Box(es)
- Programmed ringing assignments for Door Chime tones

Table 3-1 ORDER FORM, BUSINESSCOM PLUS 24/36/64

ITEM 1: MAJOR COMPONENTS:		
KSU:	1	required
24 (P/N 15100) (Power Supply cable included)		
36 (P/N 15200) (Power Supply cable included)		
64 (P/N 15300) (Power Supply cable included)		
POWER SUPPLY:	1	required
24/36 (P/N 15120)	1	required
64 (P/N 15320)	____	required
ITEM 2: PRINTED CIRCUIT BOARDS:		
B-MPU-A (P/N 15165)	1	required
B-TSU-A (P/N 15155)	____	required
B-COU-A (P/N 15105)	____	required
B-COU-B (P/N 15115)	____	required
B-STU-A (P/N 15125)	____	required
B-STU-B (P/N 15135)	____	required
B-STU-D (P/N 15181)	____	required
B-XPU-A (P/N 15360)	____	required
B-DDU-A (P/N 15130)	____	required
B-HBU-A (P/N 15140)	____	required
B-GCU-A (P/N 15180)	____	required
B-MFRU-B (P/N 15179B)	____	required
B-SPDU-A (P/N 15050)	____	required
B-LPU-A (P/N 15340) (for Businesscom Plus 64 only)	1	required
ITEM 3: TELEPHONES:		
8TS 3 Line (P/N 15009)	____	required
12TS 5 Line (P/N 15013)	____	required
12TDX 5 Line Executive Display (P/N 15015)	____	required
24TS 8 Line (P/N 15111)	____	required
24TDX 8 Line Executive Display (P/N 15113)	____	required
36TS 12 Line (P/N 15211)	____	required
36TDX 12 Line Executive Display (P/N 15213)	____	required
64TS 24 Line (P/N 15311)	____	required
64TDX 24 Line Executive Display (P/N 15313)	____	required
ITEM 4: OPTIONAL EQUIPMENT:		
24/36 DSS Console (P/N 15151)	____	required
64 DSS Console (P/N 15351)	____	required
External Paging Equipment	____	yes/no
External Music Source	____	yes/no
Number of external speakers (customer supplied)	____	required
Door Chime Box (P/N 15040)	____	required
Wall Mounting Kit (P/N 15411)	____	required
ITEM 5: INSTALLATION EQUIPMENT:		
Surge Protector	1	required
Connecting Blocks (25 pair split blocks with punchdown terminals)	____	required
Bridging Clips	____	required
Insulated Copper Grounding Wire 14 AWG. or heavier (up to 25 feet)	1	required
Copper Ground Rod (½" dia. x 3' long) OR Ground Clamp for Cold Water Pipe	1	required
25-pair cable, (for connection from RJ21X connector to KSU, maximum of 25 ft. female connectors on each end)	1	required
Station Jacks	____	required
Two-pair twisted station cable	____	required
25-pair station cable (with type 57 connector, female on one end)	____	required
Mounting hardware depends on the installation site, standard practices and National or local codes.		

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BUSINESSCOM PLUS 24/36/64
ELECTRONIC KEY TELEPHONE SYSTEMS
SECTION 4, SOFTWARE CONFIGURATION

CONTENTS PAGE

CONTENTS PAGE

1. INTRODUCTION

1.01 This section provides the information necessary to construct a data format for customizing the system to individual needs.

1.02 The Program Record Form (Appendix A) located at the end of the manual, is used as a convenient register for entering system programming data along with Section 7, PROGRAMMING.

2. DESCRIPTION

2.01 Each program is detailed in the following manner:

Access Code: the code necessary to enter data for a particular program is presented here.

Description: discusses the basic elements of the program.

Conditions: the limits of a program (e.g., the number of CO groups permitted) and the elements necessary for the program to operate (e.g., DND required for Executive Call Forward) are defined.

Instructions: the step-by-step procedures for filling out the Program Record Form are specified.

Example: a sample of a possible configuration is illustrated along with a sample Program Record Form entry.

Default: initialized values are listed.

Related Programming: other programs that limit or enhance the program under discussion are listed.

Feature Interactions: features that affect the program under consideration are listed.

NOTE: Ports, not stations, are the recipients of programming. Therefore, telephones assume the features programmed to their associated ports.

PROGRAM 1, LINE TYPE, DIAL MODE, CO QUEUEING GROUP

Access Code: 1

Description:
This program permits:
Two types of lines: PBX and CO.
Two Dial Modes: Dial Pulse and DTMF.
Four CO Queueing Groups.

Conditions:
(a) It is recommended that similar lines be grouped together with respect to CO Queueing Groups.
(b) Outward access must be programmed to queue for a line.

Instructions:
(1) In the C box, enter 0 if no line is required; enter 1 if a CO line is required; enter 3 if a PBX line is required.
(2) In the D box, enter 0 if Dial Pulse signaling is required; enter 1 if DTMF signaling is required.
(3) In the E box, enter 0 if no CO Queueing Group is required; enter the group number (1-4) if required.
(4) In the F box, enter 0.
(5) In the G box, enter 0.

Example:

A	B	C	D	E	F	G
0	1	1	1	2	0	0

A-B: Line 1
C: Line type CO selected
D: Dial Mode DTMF selected
E: CO Queueing Group 2 selected
F: Not Used
G: Not Used

Default:
Line Type—CO line
Dial Mode—DTMF
CO Queueing Group—All lines in Group 1
Not Used—0
Not Used—0

Related Programming:
CO Line Outward Access Assignment—Program 6
Private Branch Exchange (PBX) Access Codes—Program 43
Flash Type/Timing—Program 56
Dial-Pulse Sender Speed—Program 57
Make/Break Ratio—Program 58

Feature Interactions:
CO Lines
Dial Pulse (DP) to Tone (DTMF) Conversion
Line Queueing

PROGRAM 2, CO LINE GROUP ASSIGNMENTS

Access Code: 2

Description:
This program permits the formation of CO line groups.

Conditions:
(a) Thirty CO line groups are permitted.
(b) Consecutively numbered lines must be assigned in each group.
(c) Lines within one group are permitted to overlap with those of another group.
(d) Each group can have as many lines as is required.
(e) A Common Use Line provides an extra line group for incoming and outgoing calls and is accessible to all stations.
(f) CO line groups provide outgoing and/or incoming access along with incoming audible.

Instructions:
(1) In the C/D boxes, enter the lowest numbered line in the group.
(2) In the E/F boxes, enter the highest numbered line in the group.

Example:

A	B	C	D	E	F
0	1	0	1	0	3

A-B: CO Group 1
C-D: Line 1 assigned as lowest numbered line in group
E-F: Line 3 assigned as highest numbered line in group

Default:
CO Group—One CO group. All lines assigned to group 1.

Related Programming:
Line Type—Program 1
Common Use Line—Program 3
CO Line Outward Access Assignment—Program 6
CO Line Incoming/Audible Assignment—Program 7

Feature Interactions:
CO Lines

PROGRAM 3, DISA LINE, FAX LINE, COMMON USE LINE

Access Code: 3

Description:
This program permits:

A Direct Inward System Access Line that allows an external party to call into the key system and access key system features, e.g., dial access to stations.

A FAX Line that provides Remote Line Busy Indication for lines that have ancillary devices connected ahead of the key system.

A Common Use Line that provides another line group with incoming/outgoing access for each station.

Conditions:
(a) A B-STU-D PCB is necessary for DISA operation.
(b) A Common Use Line is subject to a station's Class of Service.
(c) There can be more than one Common Use Line.
(d) A line can be a DISA Line, FAX Line or Common Use Line but cannot have multiple functions at any one time.
(e) Common Use Lines are unavailable when Flexible Line Appearance is programmed.
(f) A Common Use Line can be assigned to a station that has two CO line groups assigned to it already and is accessible to all stations for incoming and outgoing purposes.
(g) Release of Abandoned Calls On Hold (Program 54) must be programmed for proper DISA function.

Instructions:
(1) In the C box, enter 0 to disable DISA Line; enter 1 to enable DISA Line.
(2) In the D box, enter 0 to disable FAX Line; enter 1 to enable FAX Line.
(3) In the E box, enter 0 to disable Common Use Line; enter 1 to enable Common Use Line.

Example:

A	B	C	D	E
0	1	0	0	1

A-B: Line 1
C: DISA Line not programmed
D: FAX Line not programmed
E: Common Use Line programmed

Default:
DISA Line—Not programmed
FAX Line—Not programmed
Common Use Line—Not programmed

Related Programming:
Instrument Type—Program 8
Release of Abandoned Calls On Hold—Program 54

Feature Interactions:
CO Lines
Flexible Line Appearance
Night Class of Service
Release of Abandoned Calls On Hold
Toll Restriction

PROGRAM 4, EXECUTIVE OVERRIDE (BARGE IN)

Access Code: 4

Description:
This program permits a station to enter into an established CO line conversation uninvited.

Conditions:
(a) Stations programmed for Executive Override can enter a Multi-Line Conference uninvited and without an alert tone, provided that the total numbers of stations in the Conference does not exceed six.
(b) Stations programmed for Executive Override can enter into a Private Line conversation uninvited.

Instructions:
(1) In the C box, enter 0 to disable Executive Override; enter 1 to enable Executive Override.

Example:

A	B	C
1	0	1

A-B: Port 10
C: Executive Override programmed

Default:
Executive Override—Not programmed

Related Programming: None

Feature Interactions:
CO Lines
Conference, Multi-Line
Private Line

PROGRAM 5, UNSUPERVISED CONFERENCE

Access Code: 5

Description:
This program permits an internal party to establish a three-way Conference with two external parties wherein the Conference link is maintained after the internal party hangs up.

Conditions:
(a) Lines used for Unsupervised Conference require open loop disconnect supervision.
(b) The following ports must be available, e.g., station PCB (B-STU-A) installed, but not terminated:

SYSTEM	PORT
24	18
36	22
64	34

(c) Unsupervised Conference requires Multi-Line Conference (Program 30).
(d) Release of Abandoned Calls on Hold (Program 54) must be programmed.

Instructions:
In the A box, enter 0 to disable Unsupervised Conference; enter 1 to enable Unsupervised Conference.

Example:

A
1

A: Unsupervised Conference programmed

Default:
Unsupervised Conference—Not programmed

Related Programming:
Multi-Line Conference—Program 30
Release of Abandoned Calls on Hold—Program 54

Feature Interactions:
Conference, Multi-Line
Release of Abandoned Calls on Hold

PROGRAM 6, CO LINE OUTWARD ACCESS ASSIGNMENT

Access Code: 6

Description:
This program permits outgoing access through CO line group assignment.

Conditions:
(a) Two CO line groups are permitted assignment to each station.
(b) A Common Use Line grants outgoing access to all stations but is subject to each station's Class of Service.
(c) Enablement of Flexible Line Appearance (Program 15) erases all data in Program 6.
(d) A Class of Service can be used to prohibit or limit a station's outward access.
(e) Night Class of Service can be used to prohibit or limit a station's outward access.

Instructions:
(1) In the C/D boxes, enter the number of the first CO line group. Enter 00 if none is required.
(2) In the E/F boxes, enter the number of the second CO line group. Enter 00 if none is required.

Example:

A	B	C	D	E	F
1	0	0	1	0	2

A-B: Port 10
C-D: Group 1 assigned
E-F: Group 2 assigned

Default:
CO Line Group 1 assigned to all ports.

Related Programming:
CO Line Group Assignments—Program 2

Feature Interactions:
CO Lines
Common Use Line
Flexible Line Appearance
Night Class of Service
Night Transfer
Toll Restriction

PROGRAM 7, CO LINE INCOMING/AUDIBLE ASSIGNMENT

Access Code: 7

Description:
This program permits the assignment of incoming CO access on a per station basis along with audible assignment for each line group.

Conditions:
(a) Two line groups are permitted assignment to each station.
(b) Stations assigned CO line groups with day audible receive incoming audible when Night Transfer is deactivated. Those assigned CO line groups with night audible receive incoming audible when Night Transfer is activated.
(c) Flexible Line Appearance (Program 15) reassigns the primary CO line groups to other Line keys but ignores the secondary group.

Instructions:

(1) In the C/D boxes, enter the primary CO group number. Enter 00 if none is required.
(2) In the E box, enter 0 if no incoming audible is required; enter 1 if day audible is required; enter 2 if night audible is required; enter 3 if both day and night audible are required.
(3) In the F/G boxes, enter the secondary CO group number. Enter 00 if none is required.
(4) In the H box, enter 0 if no incoming audible is required; enter 1 if day audible is required; enter 2 if night audible is required; enter 3 if both day and night audible are required.

Example:

A	B	bin	C	D	E	bin	F	G	H
1	0	1	0	3	1	2	0	4	3

A-B: Port 10
C-D (bin 1): Line Group 3 assigned
E: Day Audible Assigned
F-G (bin 2): Line Group 4 assigned
H: Day/Night Audible Assigned

Default:

(a) CO Line Group 1 assigned to all ports.
(b) Port 10 assigned day/night audible. All others assigned no audible.

Related Programming:

CO Line Group Assignments—Program 2

Feature Interactions:

CO Lines
Flexible Line Appearance
Night Transfer

PROGRAM 8, NIGHT CLASS OF SERVICE, CONFIRMATION TONE, INSTRUMENT TYPE, DO NOT DISTURB, PAGING GROUPS

Access Code: 8

Description:

This program permits:

Night Class of Service that is used to prohibit or limit a station's outward access when Night Transfer is activated.

A Confirmation Tone (tone signal) that is issued when a station key is pressed and the depression recognized at a key phone.

Four Instrument Types: key telephone, DISA port, DP single line OPX, DTMF single line OPX.

Three levels of Do Not Disturb as follows:

Level 1—incoming CO audible blocked.
Level 2—incoming CO/Intercom audible blocked.
Level 3—(a) incoming CO/Intercom audible blocked with first key depression.
(b) incoming CO audible blocked with second key depression.

Internal Paging groups to allow stations to receive Paging.

Conditions:

(a) A Night Class of Service supercedes a regular Class of Service at a programmed station when Night Transfer is in use.
(b) This program is used to program Night Class of Service only. Program 48 is used to assign a Night Class of Service to specific stations (the default for Program 48 assigns no restrictions or limitations to any station when Night Transfer is activated).
(c) When the system is installed behind a PBX it is necessary that a Night Class of Service 3 through 6 be programmed. This allows stations to dial PBX extensions or access PBX features.
(d) Confirmation Tone is programmable on a per station basis and is user activated on a per station basis.
(e) DISA Ports, DP single line OPX and DTMF single line OPX ports require a B-STU-D PCB.
(f) Do Not Disturb can be overridden by a DSS Console if the console is programmed — Program 13, and DND Override by DSS Console — Program 55 is also programmed.

(g) Four internal Paging groups are permitted.
(h) Stations not assigned to Paging groups do not receive Paging.
(i) Single line (OPX) telephones cannot receive Paging announcements.

Instructions:
(1) In the C box, enter 0 to disable Night Class of Service; enter 1 to enable Night Class of Service.
(2) In the D box, enter 0 to enable Confirmation Tone; enter 1 to disable Confirmation tone.
(3) In the E box, enter 0 for a key telephone; enter 1 for a DISA port; enter 2 for a DP single line OPX port; enter 3 for a DTMF single line OPX port.
(4) In the F box, enter 0 if Do Not Disturb (DND) is not required; enter 1 if DND level 1 is required; enter 2 if DND level 2 is required; enter 3 if DND level 3 is required.
(5) In the G box, enter 0 if no Paging group assignments are required; enter 1, 2, 3 or 4 if assignment to groups 1, 2, 3 or 4 is required, respectively.

Example:

A	B	C	D	E	F	G
1	0	0	0	0	2	1

A-B: Port 10
C: Night Class of Service not programmed
D: Confirmation Tone programmed
E: Key Telephone programmed
F: Do Not Disturb level 2 programmed
G: Paging Group 1 programmed

Default:
Night Class of Service—No Restrictions
Confirmation Tone—Programmed
Instrument Type—Programmed for key telephone port
Do Not Disturb—Not programmed
Paging Group—All ports assigned to group 1.

Related Programming:
DISA Line, FAX Line, Common Use Line—Program 3
DSS Console Port Assignment—Program 13
Night Class of Service Selection—Program 48
DND Override by DSS Console—Program 55

Feature Interactions:
Direct Station Selection (DSS) Console—(Paging Grou
Night Class of Service—(Night Class of Service)
Night Transfer—(Night Class of Service)
Paging, All Call—(Paging Group)
Paging, Internal Zone—(Paging Group)
Paging, Meet-Me—(Paging Group)
Toll Restriction—(Night Class of Service)

PROGRAM 9, EXECUTIVE CALL FORWARD

Access Code: 9

Description:
This program permits the transfer of incoming calls fron station, designated the Executive, to a partner, designated t Secretary, when DND is in use at the Executive station.

Conditions:
(a) Eight Executive/Secretary pairs are permitted.
(b) Two or more Executive stations can have the sar assigned Secretary station.
(c) Do Not Disturb (level 2) must be programmed for t Executive station. The initiation of DND at an Executi station overrides a DND condition at the Secreta station.
(d) CO calls are transferred with ringing.

Instructions:
(1) In the A/B boxes, enter Executive port number.
(2) In the C/D boxes, enter Secretary port number.

Example:

bin	A	B	C	D
1	1	0	1	2

A-B: Port 10 assigned as Executive
C-D: Port 12 assigned as Secretary

Default:
Executive Call Forward—Not programmed

Related Programming:
Do Not Disturb—Program 8

Feature Interactions:
Do Not Disturb

PROGRAM 10, DUAL HANDSFREE HOTLINE

Access Code: 10

Description:
This program permits a station, designated the Secretary, to simultaneously call two partner stations designated Manager stations.

Conditions:
(a) Four Manager/Secretary pairs are permitted.
(b) A Secretary station is permitted assignment to more than one Manager pair.
(c) Dual Handsfree Hotline is disabled if one or both Manager stations are using Call Forward with Follow-Me or Executive Call Forward.
(d) The user(s) at either or both Manager stations can answer handsfree.
(e) The microphone at the Manager station must be enabled for the user to reply handsfree.
(f) Dual Handsfree Hotline functions only when both Manager Stations are idle.
(g) Voice Announce must be programmed.

Instructions:
(1) In the A/B boxes, enter the Secretary port number.
(2) In the C/D boxes, enter the first Manager port number.
(3) In the E/F boxes, enter the second Manager port number.

Example:

A	B	C	D	E	F
1	0	1	1	1	4

A-B: Port 10 assigned as Secretary
C-D: Port 11 assigned as Manager
E-F: Port 14 assigned as Manager

Default:
Dual Handsfree Hotline—Not programmed.

Related Programming:
Voice Announce/Tone Signal Call—Program 24

Feature Interactions:
Call Forward With Follow-Me
Executive Call Forward
Handsfree Reply on Intercom
Intercom

PROGRAM 11, GROUP HUNT

Access Code: 11

Description:
This program permits the formation of hunt groups. Each group is assigned a hunt group number.

Conditions:
(a) Ten groups are permitted.
(b) Each group can contain a maximum of eight stations.
(c) Stations are permitted assignment to more than one group.
(d) An established CO call can be transferred to an idle hunt group station using Group Hunt Transfer.

Instructions:
(1) In the B/C boxes, enter port number(s).

Example:

A	bin	B	C
0	1	1	0
	2	1	2
	3	1	4

A: Group Number 0
B-C (bin 1): Port 10 assigned to group 0
(bin 2): Port 12 assigned to group 0
(bin 3): Port 14 assigned to group 0

Default:
Group Hunt—Not programmed

Related Programming: None

Feature Interactions:
Group Hunt Transfer
Intercom

PROGRAM 12, DOOR CHIME BOX

Access Code: 12

Description:
This program permits the use of a Door Chime Box.

Conditions:
(a) Two chime boxes are permitted.
(b) Ten stations can be programmed for Door Chime Box use.
(c) When in use the Door Chime Box utilizes an Intercom link.
(d) The number of chime tones per button depression is programmable—Program 32.
(e) Door Chime Box(es) can be accessed from any telephone or DSS Console.

Instructions:
(1) In the A/B boxes, enter the port number(s).

Example:

bin	A	B
1	1	0
2	1	5
3	1	6

A-B (bin 1): Port 10 assigned to Door Chime Box
(bin 2): Port 15 assigned to Door Chime Box
(bin 3): Port 16 assigned to Door Chime Box

Default:
Door Chime Box—Not programmed

Related Programming:
DSS Console Port Assignment—Program 13
Door Chime Box Signal—Program 32

Feature Interactions:
Automatic Intercom Answer
Intercom

PROGRAM 13, DSS CONSOLE PORT ASSIGNMENT

Access Code: 13

Description:
This program permits the port selection for a DSS Console.

Conditions:
(a) A maximum of two DSS Consoles is permitted. Each can be assigned to any port but no port can have more than one console assigned to it.
(b) A DSS Console utilizes one Intercom link if programmed. The addition of a second console does not, however, utilize a second link.
(c) The DSS Console must have a software designated port in order to function as a console.
(d) The DSS Console must be programmed to the associated key telephone software designated port in order to function as a console.

Instructions:
(1) In the A/B boxes, enter the port number of the associated key telephone for the first DSS Console. Enter 00 if none is required.
(2) In the second set of A/B boxes, enter the port number of the associated key telephone for the second DSS Console. Enter 00 if none is required.

Example:

bin	A	B
1	1	0
2	2	0

A-B (bin 1): Port 10 assigned
(bin 2): Port 20 Assigned

Default:
First DSS port—Unassigned
Second DSS port—Unassigned

Related Programming:
DSS Transfer Timer—Program 39

Feature Interactions:
Direct Station Selection (DSS) Console

PROGRAM 14, FLEXIBLE STATION NUMBER ASSIGNMENT

CAUTION: IT IS STRONGLY RECOMMENDED THAT THIS FEATURE BE PROGRAMMED LAST TO HELP AVOID CONFUSION WITH OTHER PROGRAM ENTRIES.

Access Code: 14

Description:
This program permits the reassignment of station numbers.

Conditions: †
(a) A port can be assigned a station number ranging from 10-79.
(b) If a station number is reassigned to a port within the range of ports listed below, two steps are necessary to complete the assignment.
  (1) Assign the station number as needed, e.g., assign station number 10 to port 20.
  (2) Assign the station number previously occupying the port, e.g., in our example, assign 20 to 10.
  (The initial assignment alone [step 1] allows one station number assignment to two ports. This is not permitted.)
(c) If a station number is assigned to a port beyond the range of ports listed below, only one step is needed to complete the assignment.
  (1) Assign the station number as needed, e.g., assign station number 77 to port 10.
(d) All programmed features stay with the port when a station number is changed. The features do not follow the station.
(e) When assigning station numbers, assignment should be made in ascending order.

SYSTEM	STATION NUMBER RANGE	RANGE OF PORTS
24	10-79	10-33
36	10-79	10-45
64	10-79	10-73

† See Section 2, FEATURES for another approach to explaining Flexible Station Assignment.

Instructions:
(1) In the A/B boxes, enter the port number.
(2) In the C/D boxes, enter the new station number.

Example:

A	B
1	0
2	0

C	D
2	0
1	0

A-B: Port number 10
C-D: Station number 20
A-B: Port number 20
C-D: Station number 10

Default:
Station numbers are coincidental with port numbers, i.e., stations assume the port number to which they are connected.

Related Programming: None

Feature Interactions:
Intercom

PROGRAM 15, FLEXIBLE LINE APPEARANCE

Access Code: 15

Description:
This program permits the reassignment of the primary line group assigned in Program 7 to the lowest numbered keys on all stations. For instance, if the primary line group consists of lines 2-4, lines 2-4 are made to appear on Line keys 1-3.

Conditions:
(a) Only the primary group is shifted. The secondary group is ignored.
(b) The programming of this feature erases all data in Program 6.
(c) If there are more lines in an assigned group than Line keys on a station, a "phantom ring" can result. This occurs when an incoming call is on a line to a station which has no Line key to display that call.
(d) In cases of a "phantom ring", a user is able to seize the incoming call only if Ringing Line Preference is programmed.
(e) Stations can queue for a "phantom" line but must be programmed for Recall Line Preference in order to seize the line.

(f) Common Use Lines are not available when Flexible Line Appearance is programmed.
(g) The lowest numbered line in the given primary line group is made to appear on Line key one.

Instructions:
(1) In the A box, enter 0 to disable Flexible Line Appearance; enter 1 to enable Flexible Line Appearance.

Example:

A
1

A: Flexible Line Appearance programmed

Default:
Flexible Line Appearance—Not programmed

Related Programming:
CO Line Group Assignments—Program 2
CO Line Incoming/Audible Assignment—Program 7
Ringing Line Preference—Program 20
Recall Line Preference—Program 47

Feature Interactions:
CO Lines
Component Commonality
Recall Line Preference
Ringing Line Preference

PROGRAM 16, CO CALL WAITING

Access Code: 16

Description:
This program permits a station with a seized CO line or Intercom link to receive ringing for an incoming CO call that is on another line.

Conditions:
(a) If this feature is not programmed and a CO line is seized, the user can still answer an incoming call on another CO line but receives no incoming audible for that call.
(b) CO Call Waiting signals are blocked at a given station by all levels of Do Not Disturb when Do Not Disturb is activated at that station.
(c) The station must be programmed line access to and audible for the appropriate CO line group.

Instructions:
(1) In the C box, enter 0 to disable CO Call Waiting; ent 1 to enable CO Call Waiting.

Example:

A	B	C
1	0	1

A-B: Port 10
C: CO Call Waiting programmed

Default:
CO Call Waiting—Programmed

Related Programming:
CO Line Incoming/Audible Assignment—Program 7

Feature Interactions:
CO Lines
Do Not Disturb (DND)

PROGRAM 17, NIGHT TRANSFER

Access Code: 17

Description:
This program permits selected stations to receive audible i incoming calls when Night Transfer is activated.

Conditions:
(a) System-wide initiation is available through programmir
(b) Night Transfer has answering priority over Ring Trans calls when both are in use simultaneously.
(c) Stations programmed for Night Class of Service assur a different Class of Service when Night Transfer activated. Night Class of Service overrides "normal" Cl of Service when Night Transfer is activated.
(d) If a DSS Console is programmed, it must be used activate Night Transfer unless system-wide initiation programmed.
(e) Excluded System Features (Program 49) can disal Night Transfer. If a DSS Console is programmed, retains the ability to activate Night Transfer if exclusi initiation for Night Transfer is programmed.
(f) When system-wide initiation is programmed and Nig Transfer is enabled, only stations in the same CO gro as the enabling station receive night audible.
(g) Only stations programmed for night audible recei audible when Night Transfer is activated.

Instructions:
(1) In the A box, enter 0 to permit Night Transfer initiation by the system programming station only (exclusive initiation); enter 1 to permit Night Transfer initiation by any station in the system (system-wide initiation).

Example:

A
1

A: System-Wide initiation assigned

Default:
Night Transfer—Exclusive initiation programmed

Related Programming:
CO Line Group Assignments—Program 2
CO Line Incoming/Audible Assignment—Program 7
Night Class of Service—Program 8
DSS Console Port Assignment—Program 13
Night Class of Service Selection—Program 48
Excluded System Features—Program 49

Feature Interactions:
CO Lines
Direct Station Selection (DSS) Console
Night Class of Service

PROGRAM 18, EXTERNAL PAGING OUTPUT

Access Code: 18

Description:
This program permits external zones to receive incoming CO audible, Background Music and External Alarm Signals.

Conditions:
(a) Two external zones are permitted.
(b) Speakers and amplifiers are customer provided items.
(c) If a 1 is entered into the BGM position during programming (box D), and BGM is not programmed (Program 26), the system defaults the BGM entry to zero in Program 18.
(d) A B-GCU-A PCB is required.
(e) CO Audible assignment is day/night only.

Instructions:
(1) In the B/C boxes, enter CO line group number.
(2) In the D box, enter 0 to disable Background Music; enter 1 to enable Background Music.
(3) In the E box, enter 0 to disable alarm 1; enter 1 to enable alarm 1.
(4) In the F box, enter 0 to disable alarm 2; enter 1 to enable alarm 2.

Example:

A	B	C	D	E	F
1	0	1	1	0	0

A: Speaker 1
B-C: CO line group 1
D: BGM programmed
E: Alarm 1 not programmed
F: Alarm 2 not programmed

Default:
External Paging Output—BGM, Alarms 1, 2, CO Audible—Not programmed

Related Programming:
CO Line Group Assignments—Program 2
Background Music—Program 26
Alarm Sensor—Program 28

Feature Interactions:
Background Music
CO Lines
External Alarm Signals To Stations

PROGRAM 19, ALL EXTERNAL ZONE PAGING

Access Code: 19

Description:
This program permits external zones to receive All Call Paging announcements.

Conditions:
(a) Speakers and amplifiers are customer provided items.
(b) Two zones are permitted.

Instructions:
(1) In the A box, enter 0 to disable All Call External Zone Paging; enter 1 to enable All Call External Zone Paging for zone 1; enter 2 to enable All Call External Zone Paging for zone 2; enter 3 to enable All Call External Zone Paging for both zones 1 and 2.

Example:

A
[0] A: All External Zone Paging not programmed

Default:
All External Zone Paging—Programmed for zone 1

Related Programming:
External Paging Output—Program 18
Paging Splash Tone—Program 52

Feature Interactions:
Paging, All Call

PROGRAM 20, RINGING LINE PREFERENCE

Access Code: 20

Description:
This program permits single-step seizure of incoming CO calls.

Conditions:
(a) Two levels are available:
  (1) Single-step seizure for stations with incoming access only.
  (2) Single-step seizure for stations with both incoming access and audible.

Instructions:
(1) In the A box, enter 0 to disable Ringing Line Preference; enter 1 to enable Ringing Line Preference for ports with incoming access only; enter 2 to enable Ringing Line Preference for ports with both incoming access and audible.

Example:

A
[1] A: Ringing Line Preference programmed for ports with incoming access only

Default:
Ringing Line Preference—Programmed for ports with incoming access and audible

Related Programming:
CO Line Group Assignments—Program 2
CO Line Incoming/Audible Assignment—Program 7

Feature Interactions:
CO Lines

PROGRAM 22, EXCLUSIVE HOLD

Access Code: 22

Description:
This program permits Exclusive Hold.

Conditions:
(a) If a call on Exclusive Hold is not answered within a programmed period of time, a reminder signal is sent to the Hold initiating station.
(b) If a CO call remains on Exclusive Hold throughout the issue of the reminder signal, it is automatically placed on System Hold.
(c) If Exclusive Hold is programmed, a value other than 000 must be entered into Programs 35 and 36.

Instructions:
(1) In the A box, enter 0 to disable Exclusive Hold; enter 1 to enable Exclusive Hold.

Example:

A
[1] A: Exclusive Hold programmed

Default:
Exclusive Hold—Programmed

Related Programming:
Exclusive Hold Recall—Program 35
Exclusive Hold Recall Duration—Program 36

Feature Interactions:
Hold, System

PROGRAM 23, INTERCOM CALL WAITING

Access Code: 23

Description:
This program permits a station user to send a signal tone to another station that is busy.

Conditions:
(a) Two options are available:
  (1) User controlled
  (2) Automatic
(b) If the user controlled option is programmed, the user can select whether or not to issue a Call Waiting signal. If the automatic option is programmed, a Call Waiting signal tone is automatically issued when the station is dialed.
(c) Callback and Camp-On are unavailable when Intercom Call Waiting is programmed for the automatic mode.
(d) This feature is not available at OPXs.
(e) Intercom Call Waiting can be accessed by a DSS Console or a key telephone.

Instructions:
(1) In the C box, enter 0 to disable Intercom Call Waiting; enter 1 to enable User controlled Intercom Call Waiting; enter 2 to enable Automatic Intercom Call Waiting.

Example:

A	B	C
1	0	0

A-B: Port 10
C: Intercom Call Waiting not programmed

Default:
Intercom Call Waiting—User controlled programmed

Related Programming:
DSS Console Port Assignment—Program 13

Feature Interactions:
Intercom

PROGRAM 24, VOICE ANNOUNCE/ TONE SIGNAL CALL

Access Code: 24

Description:
This program permits either the voice announce or signal call of an Intercom call.

Conditions:
(a) A voice announced call can be answered handsfree. A signal announced call cannot be answered handsfree.

Instructions:
(1) In the A box, enter 0 to enable Voice Announce Call; enter 1 to enable Tone Signal Call.

Example:

A
1

A: Tone Signal Call programmed

Default:
Voice Announce/Tone Signal Call—Voice Announce Call programmed

Related Programming: None

Feature Interactions:
Intercom

PROGRAM 25, MICROPHONE ON/OFF

Access Code: 25

Description:
This program permits the initialized status of the microphone (normally on) to be changed to a normally off status.

Conditions:
(a) The MIC key LED indicates microphone status. When the LED is illuminated, the microphone is off.
(b) Handsfree Reply on Intercom is unavailable at a given station when the microphone at that station is off.

Instructions:
(1) In the A box, enter 0 to disable Microphone ON/OFF (Microphone on, LED off); enter 1 to enable Microphone ON/OFF (Microphone off, LED on).

Example:

A
[1] A: Microphone OFF, LED on

Default:
Microphone ON/OFF—Microphone on, LED off.

Related Programming: None

Feature Interactions: None

PROGRAM 26, BACKGROUND MUSIC (BGM)

Access Code: 26

Description:
This program permits Background Music to be sent to idle stations' speakers and external zones.

Conditions:
(a) BGM is a customer supplied item and can serve as a source of Music on Hold.
(b) Speakers and amplifier for the external zone are customer provided items.
(c) BGM is interrupted at a station when that station is in use. BGM is interrupted at an external zone when a page to that zone is initiated.
(d) BGM is disabled at both monitored and monitoring stations when Room Monitor is activated.
(e) The system must be programmed for BGM if a BGM source is connected.
(f) BGM, when programmed, utilizes one Intercom link.

Instructions:
(1) In the A box, enter 0 to disable BGM; enter 1 to enab BGM.

Example:

A
[1] A: Background Music programmec

Default:
BGM—Not programmed

Related Programming:
External Paging Output—Program 18

Feature Interactions:
Intercom
Music On Hold
Room Monitor

PROGRAM 27, ROOM MONITOR

Access Code: 27

Description:
This program permits the monitoring of the environment sounds of a station.

Conditions:
(a) Room Monitor, when in use, utilizes an Intercom linl
(b) Room Monitor is unavailable to monitoring stations if th monitored station:
  (1) Seizes a CO line or an Intercom link.
  (2) Lifts the handset or presses the SPK key (LE illuminates).
  The monitor condition returns upon cancelation of th above.
(c) Room Monitor is unavailable to a monitoring station if i
  (1) Seizes a CO line or an Intercom link.
  (2) Lifts the handset or presses the SPK key (LE illuminates).
  The monitor condition returns upon cancelation of th above.
(d) Background Music is disabled at both monitored an monitoring stations when Room Monitor is activated

Instructions:
(1) In the A box, enter 0 to disable Room Monitor; enter 1 to enable Room Monitor.

Example:

A	
1	A: Room Monitor programmed

Default:
Room Monitor—Programmed

Related Programming: None

Feature Interactions:
CO Lines
Intercom

PROGRAM 28, ALARM SENSOR

Access Code: 28

Description:
This program permits the use of inputs for External Alarm Signals, each with the option of a normally open (NO) or a normally closed (NC) contact.

Conditions:
(a) Two inputs are provided.
(b) The Alarm circuitry provides distinctive tone indication.

Instructions:
(1) In the B box, enter 0 for no Alarm Sensor; enter 1 for Alarm Sensor 1.
(2) In the C box, enter 0 for a normally open contact; enter 1 for a normally closed contact.
(3) If two alarms are required, repeat steps 1 and 2 for Alarm Sensor 2.

Example:

A	B	C	
1	0	0	A: Alarm Sensor 1 B: Not programmed C: Contacts normally open

Default:
Alarm Sensor—Not programmed

Related Programming:
External Paging Output—Program 18
Alarm Signal Tone—Program 53

Feature Interactions:
External Alarm Signals To Stations

PROGRAM 30, MULTI-LINE CONFERENCE

Access Code: 30

Description:
This program permits internal parties to Conference with external parties.

Conditions:
(a) If Executive Override is programmed, other internal parties can enter the Conference using the override feature provided that the limit of six internal parties is not exceeded.
(b) This feature must be programmed for Unsupervised Conference to work.
(c) Two external parties can Conference with six internal parties.

Instructions:
(1) In the A box, enter 0 to disable Multi-Line Conference; enter 1 to enable Multi-Line Conference.

Example:

A	
1	A: Multi-Line Conference programmed

Default:
Multi-Line Conference—Programmed

Related Programming: None

Feature Interactions:
Executive Override

PROGRAM 31, THREE MINUTE WARNING TONE

Access Code: 31

Description:
This program permits the initiation of three quick splash tones through a station's speaker after a user initiates an outgoing call.

Conditions:
(a) Tones are issued every three minutes, beginning three minutes after the seizure of a CO line.

Instructions:
(1) In the A box, enter 0 to disable Three Minute Warning Tone; enter 1 to enable Three Minute Warning Tone.

Example:

A	
1	A: Three Minute Warning Tone programmed

Default:
Three Minute Warning Tone—Not programmed

Related Programming: None

Feature Interactions:
CO Lines

PROGRAM 32, DOOR CHIME BOX SIGNAL

Access Code: 32

Description:
This program permits the selection of Door Chime Box Signal duration.

Conditions:
(a) Two durations of chime tones are available:
  (1) Four seconds of double chime tones.
  (2) Thirty seconds of double chime tones.

Instructions:
(1) In the A box, enter 0 if four seconds of double chime tones are required; enter 1 if double chime tones are required for a period of 30 seconds.

Example:

A	
0	A: Four seconds of double chime tones programmed

Default:
Door Chime Signal—Four seconds of double chime tones programmed

Related Programming:
Door Chime Box—Program 12

Feature Interactions:
Door Chime Box

PROGRAM 33, SINGLE STEP ACCESS

Access Code: 33

Description:
This program permits single step seizure of an idle CO line or Intercom link.

Conditions:
(a) Outgoing CO access is necessary.

Instructions:
(1) In the A box, enter 0 to disable Single Step Access; enter 1 to enable Single Step Access.

Example:

A	
1	A: Single Step Access programmed

Default:
Single Step Access—Programmed

Related Programming:
CO Line Outward Access Assignment—Program 6

Feature Interactions:
CO Lines

PROGRAM 35, EXCLUSIVE HOLD RECALL

Access Code: 35

Description:
This program permits the selection of the time duration between an Exclusive Hold initiation and the start of the recall (reminder) signal at the Hold initiating station.

Conditions:
(a) The period prior to reminder signal initiation has a maximum limit of 2,550 seconds.
(b) If Exclusive Hold is programmed, some value other than 000 must be entered into this program or exit from the programming mode is denied.

Instructions:
(1) In the A/B/C boxes, enter the Exclusive Hold Recall timing. (The value of each digit is equivalent to ten seconds, e.g., 002 = 20 seconds.)

Example:

A	B	C
0	0	9

A-C: 90 seconds programmed

Default:
Exclusive Hold Recall—60 seconds

Related Programming:
Exclusive Hold—Program 22
Exclusive Hold Recall Duration—Program 36

Feature Interactions:
Hold, Exclusive

PROGRAM 36, EXCLUSIVE HOLD RECALL DURATION

Access Code: 36

Description:
This program permits the selection of the duration of the Exclusive Hold Recall signal.

Conditions:
(a) The duration of the recall signal has a maximum of 2,550 seconds.
(b) If Exclusive Hold is programmed, a value other than 000 must be entered into this program or exit from the programming mode is denied.

Instructions:
(1) In the A/B/C boxes, enter the Exclusive Hold Recall Duration. (The value of each digit is equivalent to ten seconds, e.g., 002 = 20 seconds.)

Example:

A	B	C
0	0	5

A-C: 50 seconds programmed

Default:
Exclusive Hold Recall Duration—30 seconds

Related Programming:
Exclusive Hold—Program 22
Exclusive Hold Recall—Program 35

Feature Interactions:
Hold, Exclusive

PROGRAM 37, SYSTEM HOLD RECALL

Access Code: 37

Description:
This program permits the selection of the time duration between a System Hold initiation and the start of the System Hold Recall (reminder) signal at the Hold initiating station.

Conditions:
(a) The duration of the reminder signal (8.5 seconds) is preset and cannot be altered.
(b) The maximum period of time between each recall signal is programmable and has a limit of 2,550 seconds.
(c) An entry of 000 disables the recall signal.

Instructions:
(1) In the A/B/C boxes, enter the recall timing. (The value of each digit is equivalent to 10 seconds, e.g., 005 = 50 seconds.)

Example:

A	B	C
0	0	4

A-C: 40 seconds programmed

Default:
System Hold Recall—60 seconds

Related Programming: None

Feature Interactions:
Hold, System

PROGRAM 38, CALL TRANSFER TIMER

Access Code: 38

Description:
This program permits the selection of the time duration between an unanswered Call Transfer Announced or Unannounced and the resulting recall signal.

Conditions:
(a) The maximum limit of the Call Transfer Timer is 2,550 seconds.
(b) If 000 is entered, the transferring station is instantly recalled.
(c) Only applies to calls transferred using Call Transfer Unannounced.

Instructions:
(1) In the A/B/C boxes, enter the Call Transfer Timer values. (The value of each digit is equivalent to ten seconds, e.g., 007 = 70 seconds.)

Example:

A	B	C
0	0	4

A-C: 40 seconds programmed

Default:
Call Transfer Timer—30 seconds

Related Programming: None

Feature Interactions:
Call Transfer Announced
Call Transfer Unannounced

PROGRAM 39, DSS TRANSFER TIMER

Access Code: 39

Description:
This program permits the selection of the time durati between an unanswered DSS Console Transfer and t resulting recall signal.

Conditions:
(a) The maximum limit of the DSS Transfer Timer is 2,5 seconds.
(b) Only applies to transferred calls placed on System Ho

Instructions:
(1) In the A/B/C boxes, enter the DSS Transfer Timer val (The value of each digit is equivalent to ten seconds, e. 008 = 80 seconds.)

Example:

A	B	C
0	0	6

A-C: 60 seconds programmed

Default:
DSS Transfer Timer—60 seconds

Related Programming:
DSS Console Port Assignment—Program 13

Feature Interactions:
Direct Station Selection (DSS) Console
Hold, System

PROGRAM 40, CLASS OF SERVICE

Access Code: 40

Description:
This program permits the selection of a Class of Service on a station-by-station basis that determines a given station's dialing capability.

Conditions:
(a) There are eight Classes of Service.
(b) Stations programmed for Night Class of Service assume a Class of Service, designated by Program 48, when Night Transfer is in use.
(c) Class of Service does not apply to PBX lines with the following qualifications:
  (1) Station users are permitted to dial any 4-digit PBX extension number.
  (2) Station users are permitted to dial any internal PBX operator.
(d) Items in condition (c) need the following in order to function:
  (1) Program 1—lines must be programmed as PBX lines.
  (2) Program 43—PBX Codes must be programmed.
(e) Class of Service does not apply to PBX lines until the programmed PBX access code has been dialed.

Instructions:
(1) In the C box, enter the Station Class of Service from the following:

0 for — COS 0	No Restriction.
1 for — COS 1	No Restriction.
2 for — COS 2	Can dial Permitted and Common Unrestricted Codes.
3 for — COS 3	Can dial Permitted, Common Unrestricted Codes and 7-digit local numbers.
4 for — COS 4	Can dial Permitted, Common Unrestricted Codes, 7-digit local numbers and 1 + 7 toll numbers.
5 for — COS 5	Can dial Common Unrestricted Codes, 7-digit local numbers and 1 + 7 toll numbers.
6 for — COS 6	Can dial Common Unrestricted Codes and 7-digit local numbers.
7 for — COS 7	Can dial Common Unrestricted Codes.
8 for — COS 8	Can dial Intercom calls only.

Example:

A B	C
1 2	8

A-B: Port 12
C: COS 8 programmed

Default:
Class of Service—Class of Service 0 programmed for all ports.

Related Programming:
CO Line Outward Access Assignment—Program 6
Night Class of Service—Program 8
Permitted Codes—Program 41
Permitted Code Digits—Program 42
Private Branch Exchange (PBX) Access Codes—Program 43
Common Unrestricted Codes—Program 44
Digit Absorbing—Program 45
Second Digit Restriction—Program 46
Night Class of Service Selection—Program 48

Feature Interactions:
CO Lines
Night Class of Service
Night Transfer
Toll Restriction

PROGRAM 41, PERMITTED CODES

Access Code: 41

Description:
This program permits the selection of codes, (frequently used numbers, e.g., area codes, toll free numbers) that allow programmed stations to dial out.

Conditions:
(a) Only stations with Classes of Service 0 through 4 can dial out using Permitted Codes.
(b) Thirty Permitted Codes are allowed.
(c) Each code can be 12 digits in length.
(d) Program 42 limits the length of a Permitted Code and the digits which can follow. However, no limitation is required by software.

(e) The OPAC key can be used to erase a Permitted Code during its programming.
(f) The DC key is used to program "Don't Cares." Do not enter 0 or DC as the first digit of a Permitted Code as this can defeat Toll Restriction.
(g) If lines are assigned as PBX lines, the PBX Access Code is not required as a digit of the Permitted Code.

Instructions:
(1) In boxes C/D/E/F/G/H/I/J/K/L/M/N, enter the Permitted Code digits.

Example:

A	B	C	D	E	F	G	H	I	J	K	L	M	N
0	1	1	DC	DC	DC	5	5	5	1	2	1	2	

A-B: Permitted Code 1
C-M: Code 1-DC DC DC-555-1212

Default:
Permitted Codes—Not programmed

Related Programming:
Class of Service—Program 40
Permitted Code Digits—Program 42

Feature Interactions:
CO Lines
Toll Restriction

PROGRAM 42, PERMITTED CODE DIGITS

Access Code: 42

Description:
This program permits the limitation of the number of digits in a Permitted Code and numbers that can follow.

Conditions:
(a) The number of digits dialed including the Permitted Code can be limited from 1 to 30.
(b) If 00 is entered, any number of digits can be dialed.

Instructions:
(1) In the A/B boxes, enter the number of Permitted Code Digits.

Example:

A	B
1	0

A-B: Permitted Code Digits limited to 10

Default:
Permitted Code Digits—Not programmed

Related Programming:
Class of Service—Program 40
Permitted Codes—Program 41

Feature Interactions:
CO Lines
Toll Restriction

PROGRAM 43, PRIVATE BRANCH EXCHANGE (PBX) ACCESS CODES

Access Code: 43

Description:
This program permits the selection of codes that allow access to CO lines if the system is behind a PBX.

Conditions:
(a) Four PBX Access Code entries are permitted.
(b) The maximum length of each code is two digits.
(c) The OPAC key can be used to erase a PBX Access Code during programming.
(d) Do not use 0 or "Don't Cares" (DC) as a first digit. This can defeat Toll Restriction. However, "Don't Cares" can be used as the second digit of a PBX Access Code.
(e) The PBX can provide Night Transfer or Call Pickup using dial access codes. These codes should be programmed as PBX Access Codes to avoid defeating Toll Restriction. Do not enter a "Don't Care" as a second digit unless specifically needed.
(f) One digit PBX access codes should be programmed with only that single digit.

Instructions:
(1) In the B/C boxes, enter the PBX Access Codes.

Example:

A	B	C
1	7	8

A: PBX Access Code 1
B-C: Code 78

Default:
PBX Access Codes—Not programmed

Related Programming:
Line Type—Program 1

Feature Interactions:
CO Lines

PROGRAM 44, COMMON UNRESTRICTED CODES

Access Code: 44

Description:
This program permits the selection of codes that allow stations to dial out commonly used numbers, e.g., information, emergency numbers, etc.

Conditions:
(a) Stations with Classes of Service 2 through 7 can dial out using Common Unrestricted Codes.
(b) Four codes are permitted.
(c) Four-digit codes are permitted.
(d) The OPAC key can be used to erase a Common Unrestricted Code during its programming.
(e) Do not use 0 or DC as a first digit as this can be used to defeat Toll Restriction.

Instructions:
(1) In the B/C/D/E boxes, enter the Common Unrestricted Code.

Example:

A	B	C	D	E
2	6	1	1	

A: Common Unrestricted Code 2
B-D: Code—611

Default:
Common Unrestricted Codes—Not programmed

Related Programming:
Class of Service—Program 40

Feature Interactions:
CO Lines
Toll Restriction

PROGRAM 45, DIGIT ABSORBING

Access Code: 45

Description:
This program permits the system to ignore, for Toll Restriction purposes, certain digits when dialed as the first digit.

Conditions:
(a) Four entries are permitted.
(b) One-digit code is permitted.
(c) The OPAC key can be used to erase a Digit Absorbing entry during its programming.
(d) Do not use 0 or DC as a first digit as this can be used to defeat Toll Restriction.

Instructions:
(1) In the B boxes, enter the absorbed digit.

Example:

A	B
1	3

A: First Digit Absorbed
B: Digit 3 absorbed

Default:
Digit Absorbing—Not programmed

Related Programming: None

Feature Interactions:
CO Lines
Toll Restriction

PROGRAM 46, SECOND DIGIT RESTRICTION

Access Code: 46

Description:
This program permits the dialing restriction of a 1 or 0 as a second digit.

Conditions:
(a) This program is effective for Classes of Service 3 through 6.

Instructions:
(1) In the A box, enter 0 to disable Second Digit Restriction (no restriction of 1 or 0); enter 1 to enable Second Digit Restriction (restriction of 1 or 0).

Example:

A
[0] A: Second Digit Restriction Not programmed

Default:
Second Digit Restriction—Not programmed

Related Programming: None

Feature Interactions:
Toll Restriction

PROGRAM 47, RECALL LINE PREFERENCE

Access Code: 47

Description:
This program permits single step seizure of a recalled line.

Conditions:
(a) A recall can be issued in cases of:
  (1) Call Transfer Announced
  (2) Call Transfer Unannounced
  (3) Exclusive Hold
  (4) Line Queueing
  (5) System Hold
(b) Exclusive Hold Recall is programmable.
(c) Stations can queue for a line that they have access to, b do not have line appearance for, if Recall Line Preferen is programmed.

Instructions:
(1) In the A box, enter 0 to disable Recall Line Preferenc enter 1 to enable Recall Line Preference.

Example:

A
[1] A: Recall Line Preference programmed

Default:
Recall Line Preference—Programmed

Related Programming:
CO Queueing Group—Program 1
Exclusive Hold Recall—Program 35

Feature Interactions:
Call Transfer Announced
Call Transfer Unannounced
Hold
Line Queueing

PROGRAM 48, NIGHT CLASS OF SERVICE SELECTION

Access Code: 48

Description:
This program permits the selection of the Classes of Servi available to stations when Night Transfer is activated.

Conditions:
(a) Night Class of Service must be programmed for th program to work (Program 8).
(b) There are eight Classes of Service:
  COS 0 — No Restriction.
  COS 1 — No Restriction.
  COS 2 — Can dial Permitted and Common Unrestricte Codes.
  COS 3 — Can dial Permitted, Common Unrestricte Codes and 7-digit local numbers.

COS 4 — Can dial Permitted, Common Unrestricted Codes, 7-digit local numbers and 1 + 7 toll numbers.
COS 5 — Can dial Common Unrestricted Codes, 7-digit local numbers and 1 + 7 toll numbers.
COS 6 — Can dial Common Unrestricted Codes and 7-digit local numbers.
COS 7 — Can dial Common Unrestricted Codes.
COS 8 — Can dial ICM calls only.

(c) Stations programmed for Night Class of Service assume the Class of Service selected by this program when Night Transfer is activated.

CAUTION: THE DEFAULT VALUE OF NIGHT CLASS OF SERVICE DOES NOT ALLOW EMERGENCY NUMBERS TO BE DIALED UNLESS PROGRAMMED AS COMMON UNRESTRICTED CODES.

Instructions:
(1) In the A box, enter the Class of Service.

Example:

A
1

A: COS 1 programmed

Default:
Night Class of Service Selection—COS 7

Related Programming:
Night Class of Service—Program 8

Feature Interactions:
Night Class of Service
Night Transfer
Toll Restriction

PROGRAM 49, EXCLUDED SYSTEM FEATURES

Access Code: 49

Description:
This program permits the disablement of certain features that are enabled upon initialization.

Conditions:
(a) The following feature groups can be disabled:
(1) Meet-Me Paging, Meet-Me Conference, Call Pickup
(2) Call Forward With Follow-Me, Night Transfer
(3) Call Transfer Unannounced, Call Transfer Announced
(4) Add-On Conference
(5) Step Calling, Camp-On, Message Waiting
(6) Not used
(7) Class of Service Restriction Override for System Speed Dial Numbers

(b) The feature group number preceding each feature list represents those features that can be disabled when that number is entered into programming.
(c) Enablement of this program implies disablement of some feature(s).
(d) Even if Night Transfer is disabled by this program, a DSS Console still retains the ability to activate Night Transfer if exclusive enablement of Night Transfer is programmed.
(e) When group 7 is disabled (programmed with a 0), stations with Classes of Service 0-6 can access System Speed Dial numbers. When group 7 is enabled (programmed with a 1), stations are restricted by their Classes of Service from accessing Speed Dial numbers.

Instructions:
(1) In the B box, enter 0 if this feature group is not to be disabled; enter 1 if the feature group is to be disabled.

Example:

A	B
5	1

A: Group number 5
B: Step Calling, Camp-On, Message Waiting disabled

Default:
Excluded System Features—Not programmed

Related Programming:
DSS Console Port Assignment—Program 13

Feature Interactions:
Call Forward with Follow-Me
Call Pickup
Call Transfer Announced
Call Transfer Unannounced

Camp-On
Conference, Add-On
Conference, Meet-me
Direct Station Selection (DSS) Console
Message Waiting
Night Transfer
Paging, Meet-Me
Speed Dial (System)
Step Calling

PROGRAM 50, CALL DURATION TIMER

Access Code: 50

Description:
This program permits an Executive Display telephone to time an outgoing call.

Conditions:
(a) The timer can be programmed to start automatically upon call initiation or at any time thereafter (Program 51).
(b) The timer can be manually started.

Instructions:
(1) In the A box, enter 0 to disable Call Duration Timer; enter 1 to enable Call Duration Timer.

Example:

A	
1	A: Call Duration Timer programmed

Default:
Call Duration Timer—Not programmed

Related Programming:
Call Duration Start Timer—Program 51

Feature Interactions:
CO Lines

PROGRAM 51, CALL DURATION START TIMER

Access Code: 51

Description:
This program permits the selection of a start time for the Call Duration Timer.

Conditions:
(a) Call Duration Timer (Program 50) must be enabled.
(b) The timer can be programmed to start from 0 to 255 seconds after CO line seizure.
(c) If the call is placed on Hold, the timer ceases and loses track of that call.

Instructions:
(1) In the A/B/C boxes, enter the Call Duration Start Timer period. (Each digit is equal to one second, e.g., 009 = 9 seconds.)

Example:

A	B	C	
0	0	8	A-C: 8 seconds programmed

Default:
Call Duration Start Timer—20 seconds

Related Programming:
Call Duration Timer—Program 50

Feature Interactions:
Call Duration Timer

PROGRAM 52, PAGING SPLASH TONE

Access Code: 52

Description:
This program permits a double splash tone to precede a Paging announcement.

Conditions: None

Instructions:
(1) In the A box, enter 0 to disable Paging Splash Tone; enter 1 to enable Paging Splash Tone.

Example:

A	
1	A: Paging Splash Tone programmed

Default:
Paging Splash Tone—Double Splash Tone programmed

Related Programming:
Paging Groups—Program 8

Feature Interactions:
Paging, All Call
Paging, All External Zone
Paging, External Zone
Paging, Internal Zone
Paging, Meet-Me

4

PROGRAM 53, ALARM SIGNAL TONE

Access Code: 53

Description:
This program permits external zones and selected stations to receive External Alarm Signals.

Conditions: None

Instructions:
(1) In the C box, enter 0 to disable Alarm Signal Tone; enter 1 to enable Alarm Signal Tone.

Example:

A	B	C	
1	0	1	A-B: Port 10 C: Alarm Signal Tone programmed

Default:
Alarm Signal Tone—Not programmed

Related Programming:
Alarm Sensor—Program 28

Feature Interactions:
CO Lines
External Alarm Signals To Stations

PROGRAM 54, RELEASE OF ABANDONED CALLS ON HOLD

Access Code: 54

Description:
This program permits the release of a CO line when a party on Hold on that line hangs up.

Conditions:
(a) Two time-interval detections are programmable:
  (1) Ignores opens less than 20 msec. and may release between 20—90 msec. (electromechanical COs)
  (2) Ignores opens less than 400 msec. and may release between 400—600 msec. (electronic COs)
(b) The CO must provide disconnect supervision.
(c) If a PBX is used, it must provide disconnect supervision.
(d) This feature must be programmed for the proper operation of Unsupervised Conference.
(e) Certain central offices detect the disconnect and open the line for a given length of time. The system logic releases the line when prompted by the "open."
(f) DISA requires programming of Release of Abandoned Calls on Hold.

Instructions:
(1) In the A box, enter 0 to disable Release of Abandoned Calls on Hold; enter 1 to ignore opens of less than 20 msec. and release by 90 msec.; enter 2 to ignore opens of less than 400 msec. and release by 600 msec.

Example:

A	
0	A: Release of Abandoned Calls on Hold not programmed

Default:
Release of Abandoned Calls—Programmed to ignore opens less than 400 msec. and release upon detection of 400-600 msec. open (electronic COs).

Related Programming:
Exclusive Hold—Program 22

Feature Interactions:
Hold

PROGRAM 55, DND OVERRIDE BY DSS CONSOLE

Access Code: 55

Description:
This program permits a DSS Console to override a Do Not Disturb condition at any station.

Conditions:
(a) The console cannot override a Do Not Disturb condition at the Executive station of an Executive Call Forward pair, when Executive Call Forward is activated at that station.
(b) The console must be programmed a port assignment.

Instructions:
(1) In the A box, enter 0 to disable DND Override by DSS Console; enter 1 to enable DND Override by DSS Console.

Example:

A
1

A: DND Override by DSS Console programmed

Default:
DND Override by DSS Console—Not programmed

Related Programming:
Do Not Disturb—Program 8
DSS Console Port Assignment—Program 13

Feature Interactions:
Direct Station Selection (DSS) Console
Executive Call Forward

PROGRAM 56, FLASH TYPE/TIMING-

Access Code: 56

Description:
This program permits the selection of Flash rates for CO ar PBX lines.

Conditions:
(a) Flash rates of approximately 0.5 seconds to 255 secon are available through programming.
(b) A flash can be stored in a Speed Dial number.
(c) The system provides an open loop flash which programmable for PBX or CO lines.
(d) Flash allows the transfer of internal PBX calls to oth PBX extensions.
(e) Flash allows access to PBX features including transf
(f) The Flash timing required is determined by the CO PBX.

Instructions:
(1) In the first set of B/C/D boxes, enter the Flash rate f CO lines. (Each digit is equal to one tenth of a second
(2) In the second set of B/C/D boxes, enter the Flash ra for PBX lines. (Each digit is equal to one tenth of second.)

Example:

A	B	C	D
1	0	2	0

A: CO Line
B-D: Flash Timing of 2 seconds programmed

Default:
Flash Type/Timing—CO line: 1.5 seconds
PBX line: 0.7 seconds

Related Programming:
Line Type—Program 1

Feature Interactions:
CO Lines

PROGRAM 57, DIAL-PULSE SENDER SPEED

Access Code: 57

Description:
This program permits the selection of a Dial Pulse transmission rate.

Conditions:
(a) Two rates are available:
  (1) 10 Pulses Per Second (pps)
  (2) 20 Pulses Per Second (pps)
(b) PPS rate is determined by CO/PBX.
(c) Each line must be programmed separately.

Instructions:
(1) In the C box, enter 0 for a Dial-Pulse Sender Speed of 10 pps; enter 1 for a Dial-Pulse Sender Speed of 20 pps.

Example:

A B	C
0 1	0

A-B: Line 1
C: Programmed for 10 pps

Default:
Dial-Pulse Sender Speed—10 pps.

Related Programming:
Dial Mode—Program 1
Make/Break Ratio—Program 58

Feature Interactions:
Dial Pulse to Tone (DTMF) Conversion

PROGRAM 58, MAKE/BREAK RATIO

Access Code: 58

Description:
This program permits the selection of a Make/Break Ratio for Dial Pulse signaling.

Conditions:
(a) Two Make/Break Ratios are available:
  (1) 33%/67%
  (2) 39%/61%
(b) The choice of ratio is selected by type of CO or PBX.

Instructions:
(1) In the A box, enter 0 for a Make/Break Ratio of 33%; enter 1 for a Make/Break Ratio of 39%.

Example:

A
1

A: Ratio of 39%/61% programmed

Default:
Make/Break Ratio—39%/61%

Related Programming:
Dial Mode—Program 1
Dial-Pulse Sender Speed—Program 57

Feature Interactions:
Dial Pulse to Tone (DTMF) Conversion

PROGRAM 60, CO AUDIBLE RATE ASSIGNMENT

Access Code: 60

Description:
This program permits the selection of a CO audible rate.

Conditions:
(a) Two audible rates are available.
(b) Programming allows either a rate of one second of tone, with two seconds of pause, or a continuous tone.

Instructions:
(1) In the C box, enter 0 for a CO Audible Rate Assignment of one second of tone, two seconds of pause; enter 1 for a continuous rate.

Example:

A B	C
1 0	1

A-B: Port 10
C: Continuous rate programmed

Default:
CO Audible Rate Assignment—One second of tone, two seconds of pause.

Related Programming:
CO Audible Rate Assignment Timer—Program 61

Feature Interactions:
CO Lines

PROGRAM 61, CO AUDIBLE RATE ASSIGNMENT TIMER

Access Code: 61

Description:
This program permits the selection of the time length between CO audible initiation and the start of a different rate of audible.

Conditions:
(a) The audible rate changes to a continuous rate after the programmed period of time.

Instructions:
(1) In the A/B/C boxes, enter the CO Audible Rate Assignment timer value. (Each digit is equal to 1 second.)

Example:

A	B	C
0	1	0

A-C: 10 seconds programmed

Default:
CO Audible Rate Assignment Timer—Not Programmed

Related Programming:
CO Audible Rate Assignment—Program 60

Feature Interactions:
CO Lines

PROGRAM 90, ERROR CHECK

Access Code: 90

Description:
This program permits checks for programming errors. If some parameter of the software is exceeded during programming, an error code, E, appears on the telephone display when program exit is sought. If no parameter is violated, an E0 is displayed and programming exit is permitted.

Conditions: None

Instructions: (See Program 90, Section 7.)

Example: (See Program 90, Section 7.)

Default: E0

Related Programming: Not applicable

Feature Interactions: Not applicable

PROGRAM 91, SPEED DIAL NUMBER INITIALIZATION

Access Code: 91

Description:
This program permits the erasure of all Speed Dial numbers and replaces them with no data.

Conditions:
(a) This program initializes Speed Dial bins (DSS keys) with: 01—08 for bins 1-8 and reserves bins 9 and 10 as Save and Last Number Dial bins, respectively.
(b) This program does not erase Last Number Dial bin data but does erase Save bin data.
(c) This program initializes DSS keys with 10-18 for bins 1-9 and reserves bin 10 as an All Call (80).
(d) This program resets clock alarm.

Instructions: (See Program 91, Section 7.)

Example: Not applicable

Default: See Conditions

Related Programming: Not applicable

Feature Interactions:
Speed Dial

PROGRAM 99, PROGRAMMING CANCELATION

Access Code: 99

Description:
This program permits the erasure of all programming in the programming buffer. All previous values are returned.

Conditions:
(a) During programming, all entered data are stored in a buffer until the programming mode is exited. If this program is enabled prior to programming mode exit, all entered data are ignored.

Instructions: (See Program 99, Section 7.)

Example: Not applicable

Default: Not applicable

Related Programming: Not applicable

Feature Interactions: Not applicable

BUSINESSCOM PLUS 24/36/64
ELECTRONIC KEY TELEPHONE SYSTEMS
SECTION 5, INSTALLATION

CONTENTS PAGE

1. INTRODUCTION

1.01 The INSTALLATION Section provides detaile procedures for installing the Businesscom Plu 24/36/64 systems. Read this entire section before proceedin with the actual installation.

1.02 The National Electrical Code (NEC) requires th local operating telephone company (telco) t provide primary protection devices on telephone line terminated at customer sites. Check the entry point to se that a primary protection device is installed. If no such devic is present, notify the telco *before* proceeding with th installation.

WARNING: THIS ELECTRONIC TELEPHONE SYSTEM REQUIRES A PRIMARY PROTECTION DEVICE ON THE TELCO SIDE OF THE DEMARCATION POINT.

2. PREPARATION

2.01 Factors in the following paragraphs must be considered before proceeding with the installation.

SITE REQUIREMENTS (Figures 5-1a, b, c)

2.02 The area for mounting the KSU and Power Supply should be clean, dry, temperature controlled and accessible to authorized personnel only. The site should be away from caustic chemicals, vibrations (e.g., heavy machinery) and static electricity (e.g., copying machines). The location should have ample room to mount and maintain the equipment.

2.03 The Power Supply requires a dedicated 117 VAC @ 60Hz, 15 Amp circuit. The AC service used must be a NEMA 5-15R outlet and located within six feet of the power supply location. The AC service must provide a "third wire ground".

2.04 An earth ground must be provided within 25 feet (7.6m) of the installation. The third wire of the AC line cord is not an acceptable earth ground for the KSU. In most installations, a cold water pipe that is metallic throughout (with all meters and joints bypassed) generally provides a good earth ground.

5

TOOLS AND TEST EQUIPMENT

2.05 The following items may be needed:

M = MANDATORY

M - Work light—flashlight or droplight
M - Extension cord for AC power (possibly two)
- Ladder(s) (depending on location)—step type
- Handsaw for cutting wood
M - Tape measure or folding ruler
M - Level (for mounting backplane and equipment)
M - Electric or hand-drill—for predrilling mounting holes
- If mounting on masonry, suitable drilling equipment. (A "star-drill" and a hammer or masonry drill bit may be used. Wear safety glasses.)
M - Screwdrivers (wrenches or sockets if hex-head hardware is used)
M - Electrical tape
M - Fish tape
M - Wire cutters
M - Wire strippers
M - Sheathing tool—for 25-pair cabling and station cabling
M - Pliers
M - Hammer
M - Punch-down tool
- Any tools necessary to install ground rod or cold water pipe ground lug (shovel, sledgehammer, pick, stone chisels, etc.)
M - Needle-nose pliers
M - Plastic probe or tuner tool
M - Lineman's test set
- Tone generation device—"Toner"
M - Grounded wrist strap
M - Volt / OHM meter—high input impedance, ± 1% tolerance of accuracy
M - Installation Manual and User's Guide
M - Marking pens / pencils for marking mounting locations and block / jack labeling

EQUIPMENT REQUIREMENTS

2.06 Unpack the telephone equipment and compare the equipment received to a list of equipment ordered to ensure that all components are on site. Check for any physical damage. Verify the number and types of station instruments for the installation.

2.07 Have the necessary hardware and cables available. This includes: exterior grade plywood backboard for the Main Distribution Frame (MDF) (3/4 inch preferred), 25-pair cable with female connector at one end for connection to RJ21X, two-pair twisted station cable, grounding wire (14AWG), connecting blocks (66M1-50 type) with bridging clips, modular station jacks (625A4, 625F4, or equivalent with screw terminals), power line surge protector, and appropriate mounting hardware.

Mounting Hardware

2.08 The following are recommended:

Backplane mounting hardware:

(a) ¼ inch lug bolts
(b) ¼ inch masonry anchors or #12 or #14 wood screws or sheet metal screws

KSU and Power Supply mounting hardware:

(a) #8 or #10 round head wood screws
(b) #8 or #10 pan head sheet metal screws (at least the thickness of the backplane)
(c) #12 round head machine screws with "tee—nuts" or other suitable fasteners (at least the thickness of the backplane)

Connecting Blocks Hardware

2.09 Hardware selection varies with type of block. Most installers use #8 or #10 × ¾ inch pan head sheet metal screws for mounting Distribution Rings and Spindles.

2.10 Verify that the following documents are complete and on the premises before starting the installation:

(a) Building plan showing location and type of telephone instrument, extension numbering, special considerations
(b) Program Record Form prepared prior to installation

3. INSTALLATION

3.01 Installation procedures are divided into four parts: KSU and Power Supply Installation, PCB Insertion, Station Cabling and System Connections, and Wiring Check.

WARNING: ALTERATIONS OR MODIFICATIONS OF THIS EQUIPMENT NOT EXPRESSLY SHOWN IN THIS INSTALLATION MANUAL ARE PROHIBITED. IF EQUIPMENT MALFUNCTION IS SUSPECTED, DISCONNECT THE SYSTEM FROM THE TELEPHONE COMPANY LINES BY UNPLUGGING THE TELCO RJ21X CONNECTOR.

WARNING: FOR PROTECTION AGAINST RISK OF FIRE, REPLACE FUSES ONLY WITH FUSES OF THE SAME TYPE AND RATING.

4. KSU AND POWER SUPPLY INSTALLATION

CAUTION: ALLOW ROOM FOR CHANGES AND EXPANSION WITH YOUR KSU AND CONNECTING BLOCK MOUNTING LOCATIONS. POSITION EQUIPMENT ON MOUNTING SITE TO ALLOW FOR EASIEST SERVICE, VENTILATION AND DIRECT LIGHTING.

4.01 The Main Distribution Frame (MDF) is mounted on the same plywood backboard that is used for mounting the system equipment. The plywood should be painted or sealed if located in a damp environment or on masonry. Attach the plywood to the designated location with appropriate fasteners. Mark the equipment layout on the backboard using the installation layout.

4.02 A POWER LINE SURGE PROTECTOR SUCH AS THE TII MODEL 428 OR TII MODEL 439 OR EQUIVALENT MUST BE INSTALLED at the dedicated AC receptacle to minimize the effects from high static voltage, low level transients, and ripple effects. The protector should be a self contained, 3-prong grounded receptacle with a 15A capacity, or equivalent. Connect this unit according to the manufacturer's instructions.

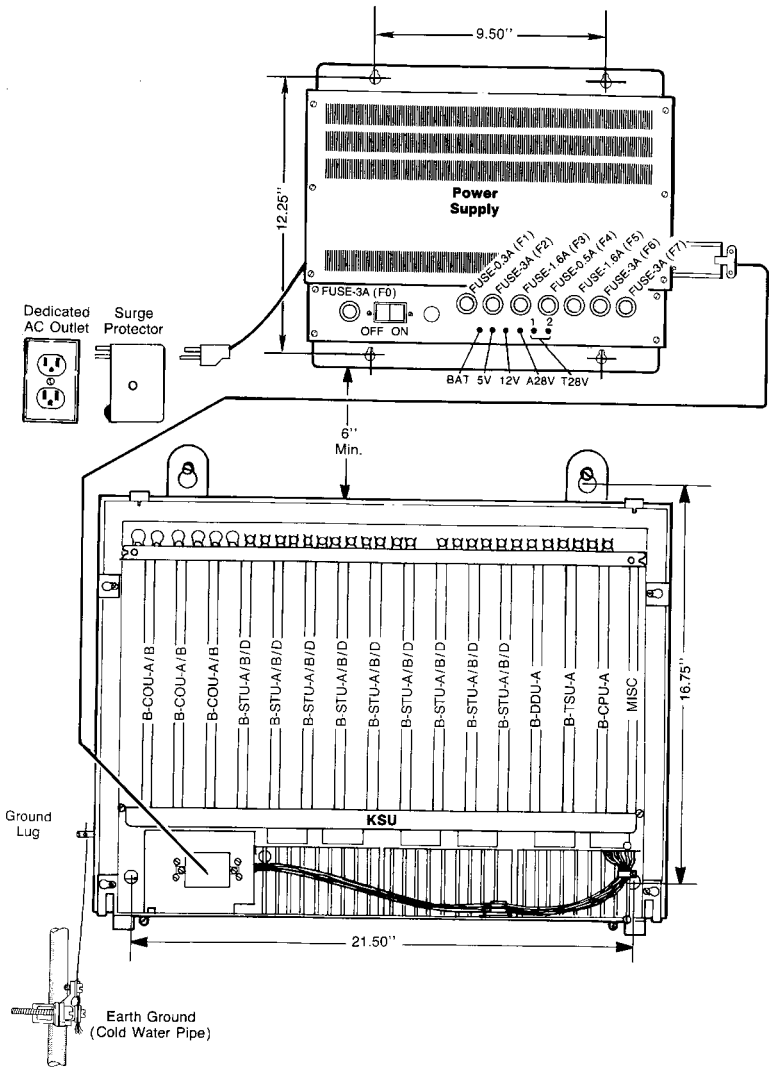
5

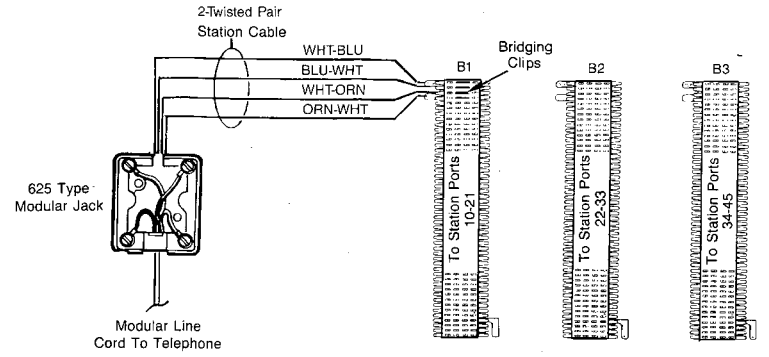
KSU MOUNTING (Figures 5-1a, b, c)

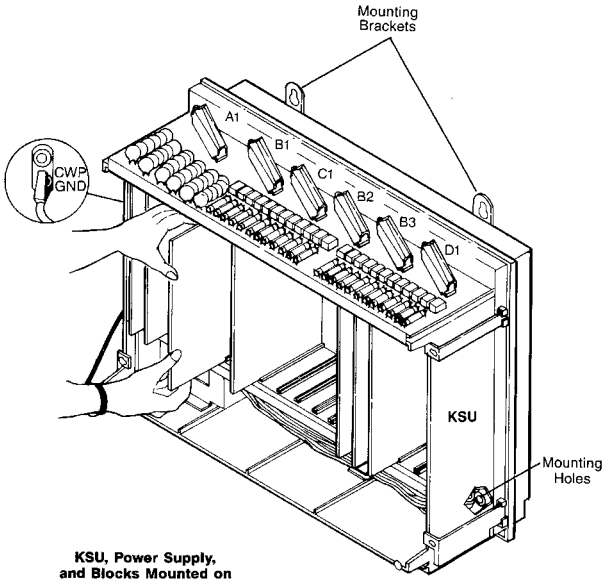
4.03 To mount the KSU:

- Mark four points on the plywood backboard that correspond to the dimensions between the mounting hole centers.
- Drill pilot holes at these points and insert suitable fasteners having a #10 shank diameter. Screw in fasteners until the clearance between the fastener head and the mounting surface is ¼ inch.
- Mount KSU on the four fasteners.
- Tighten each fastener until the KSU is securely attached to the plywood backboard.

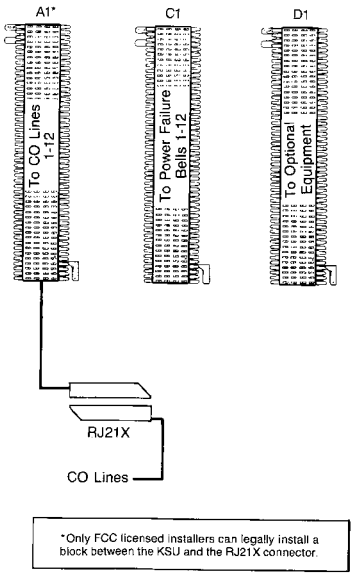
NOTE: Do not install any PCBs at this time.





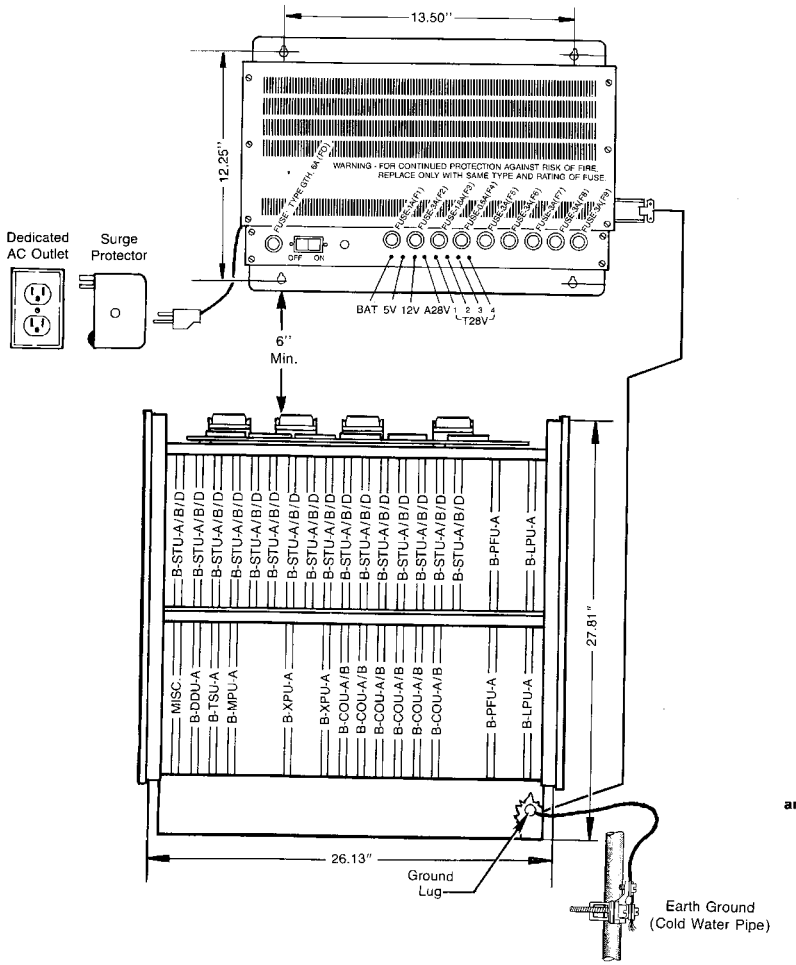


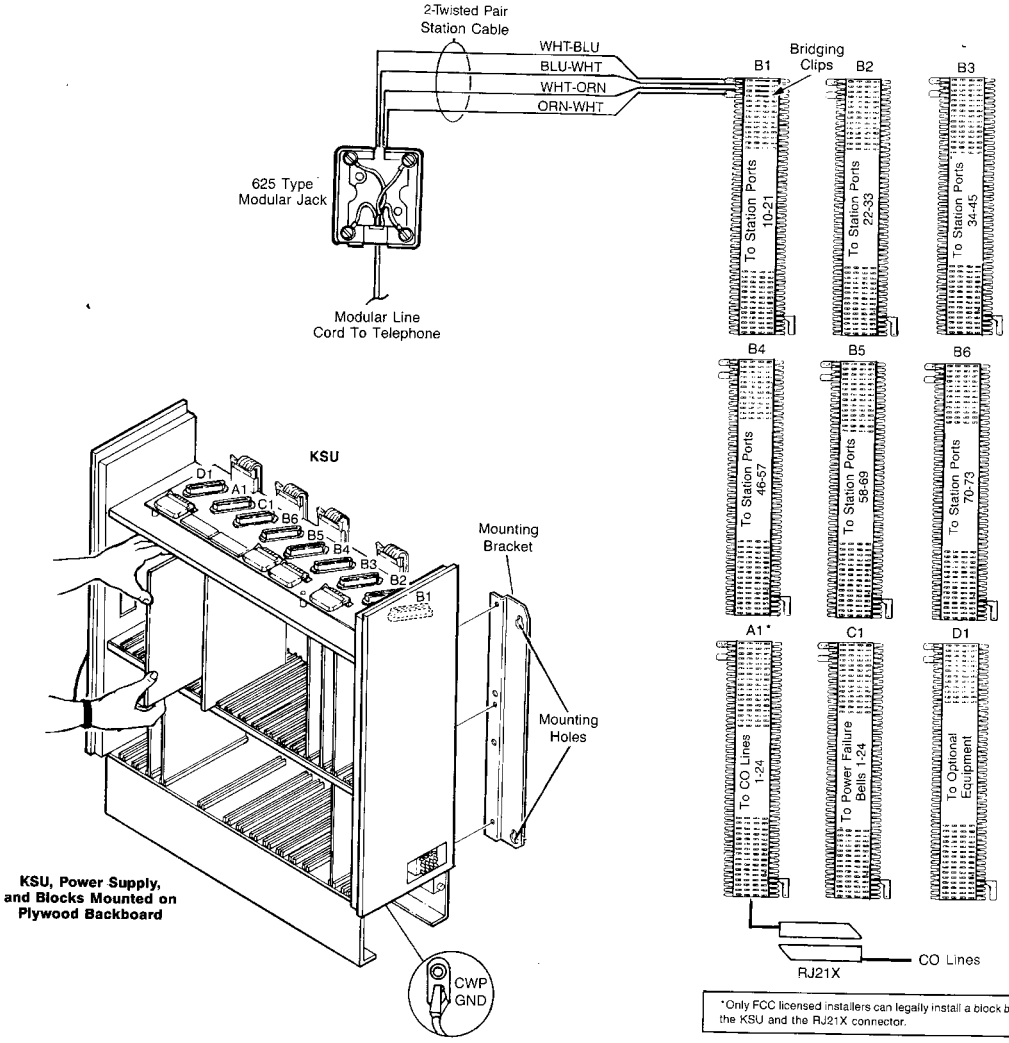
KSU, Power Supply, and Blocks Mounted on Plywood Backboard



*Only FCC licensed installers can legally install a block between the KSU and the RJ21X connector.

BUSINESSCOM PLUS 36 INSTALLATION LAYOUT
Figure 5-1b





BUSINESSCOM PLUS 64 INSTALLATION LAYOUT
Figure 5-1c

KSU GROUNDING (Figures 5-1a, b, c)

4.04 Ground the KSU by connecting one end of a 14AWG, or heavier, insulated copper wire to the grounding lug on the KSU. Connect the other end of the wire to a grounding clamp and cold water pipe or other known earth ground. The ground wire should be as short as possible.

NOTE: Do not install PCBs at this point.

POWER SUPPLY MOUNTING (Figures 5-1a, b, c)

4.05 The Power Supply should be mounted at least six inches above the KSU or to one side of it and within six feet of the AC outlet. To mount the Power Supply:

- Mark four points on the backboard that correspond to the dimensions between the mounting hole centers.
- Drill pilot holes at these points and insert suitable fasteners with a #10 shank diameter. Screw in fasteners until the clearance between the fastener head and the mounting surface is ¼ inch.
- Mount Power Supply on the four fasteners.
- Tighten each fastener until the Power Supply is securely attached to the mounting surface.

WARNING: BE SURE POWER IS OFF BEFORE DISCONNECTING OR CONNECTING POWER SUPPLY TO KSU.

POWER SUPPLY GROUNDING

4.06 The Power Supply is grounded through the third-wire lead of the AC power cord. No other Power Supply grounding is required.

4.07 Connect the KSU to the Power Supply using the supplied cable. The connection for the Power Supply is located on the right-hand side. The connection for the KSU is located in the lower left-hand corner (cover removed).

- Turn on the Power Supply and verify that the voltage indicators (LEDs on Power Supply) are illuminated.
- After verifying power LEDs, turn supply off and unplug from AC power.

5. PCB INSERTION

STATIC PRECAUTIONS

WARNING: USE A GROUNDED WRIST STRAP WHEN HANDLING ANY PCBs TO PREVENT DAMAGE.

WARNING: BE SURE THAT THE SYSTEM POWER IS OFF BEFORE REMOVING OR INSERTING PCBs.

5.01 Printed Circuit Board (PCB) assemblies are sensitive to static electricity. Use the proper precautions to guard against static damage when installing or maintaining them. The following paragraphs describe safe techniques for handling static sensitive equipment.

5.02 Static sensitive PCBs are shipped in static free bags. The PCBs should be handled only when they are fully protected and inside the bag. Do not use the bag as a holder for the PCB when it is outside the bag. To minimize static charges, first discharge any accumulated body static by touching a grounded object and then attach a grounded wrist strap.

5.03 When working with static sensitive PCBs, keep the work area free of any objects that may contain a static charge. This includes plastic as well as metal objects. Never slide a PCB across a work surface. Keep foot movement to a minimum to prevent a charge build-up.

PCB LOCATION (Figures 5-1a, b, c)

5.04 Each PCB is keyed so that it fits a specific slot in the KSU. To insert a PCB, place the connector edge into the slot first, keeping the component side of the PCB facing the installer's left.

5.05 A PCB should be installed with the thumb of each hand on the card edge and the fingers on the KSU frame. Push the PCB until firmly seated.

WARNING: DO NOT PLACE THE B-MPU-A PCB ON A CONDUCTIVE SURFACE WITH ITS BATTERY CONNECTED.

5.06 Be sure that the lithium battery is in place and unconnected. The letters BAT are flashed in the upper right corner of Display telephones if the battery is not connected or is weak. Set the WR switch to the initial position.

5.07 Switch SW1 which is located on the B-TSU-A board selects for internal or external Music On Hold. If internal MOH is required, set SW1 to position 1. If external MOH is required, set SW1 to the opposite end of 1.

5.08 Potentiometer VR1 which is located on the B-TSU-A PCB, is used to adjust the background level for MOH.

5.09 Refer to Section 6 for INSTALLATION OF OPTIONAL EQUIPMENT.

5

6. STATION CABLING AND SYSTEM CONNECTIONS

CONNECTING BLOCKS (Figures 5-1a, b, c)

6.01 Mount the required connecting blocks (66M1-50 or equivalent) to the right side of the KSU. These blocks are recommended for station cable, console cable, external paging, background music and alarm terminations as listed in Tables 5-1 through 5-3. By specification, these systems utilize twisted-pair station cabling to reduce interference due to cabling. Twisted-pair cabling generally refers to cabling that has each pair twisted at a rate of 10 twists per foot-length of cable.

6.02 Use 25-pair cables to connect the station blocks to the KSU connector. Assignment of ports is designated on the block as follows:

24 System:

B1 Ports 10-21
B2 Ports 22-33
A1 Lines 1-8
C1 Power failure bells 1-8
D1 DSS Consoles, Door Chime Boxes, MOH, Loudspeakers, BGM Source, Alarm Inputs

36 System:

B1 Ports 10-21
B2 Ports 22-33
B3 Ports 34-45
A1 Lines 1-12
C1 Power failure bells 1-12
D1 DSS Consoles, Door Chime Boxes, MOH, Loudspeakers, BGM Source, Alarm Inputs

64 System:

B1 Ports 10-21
B2 Ports 22-33
B3 Ports 34-45
B4 Ports 46-57
B5 Ports 58-69
B6 Ports 70-73
C1 Power failure bells 1-24
A1 Lines 1-24
D1 DSS Consoles, Door Chime Boxes, MOH, Loudspeakers, BGM Source, Alarm Inputs

6.03 If Unsupervised Conference is used, a 600 OHM resistor with a rating of ½ WATT and a 10% tolerance must be punched down at the following points:

System	Block	Clip No.
24	B1	33, 34
36	B2	1, 2
64	B3	5, 6

6.04 Mount a modular jack assembly, 625A4 or 625F4 at each station location.

STATION CABLING

6.05 Any Off-Premises Extension (OPX) or station requires telco OPX lines. Do not run cable from the KSU to extensions or stations in other buildings.

6.06 Use two-pair twisted station cable from the KSU and station blocks to the modular jacks at the telephones. Station cable is home run to the connecting block and should not exceed 1,000 feet for 24AWG wire or 1,500 feet for 22AWG wire.

CAUTION: DO NOT USE RANDOM TWISTED 4-WIRE INSIDE CABLE (QUAD) BETWEEN THE STATIONS AND THE MAIN DISTRIBUTION FRAME (MDF). THIS CAN CAUSE CROSSTALK AND NOISE ON THE VOICE AND DATA PAIRS. THE USE OF 25-PAIR CABLE CAN CAUSE CROSSTALK AND/OR NOISE ON THE VOICE AND/OR DATA PAIRS.

6.07 Station cabling is terminated at the station blocks (KSU) and station jacks. Connect stations as follows:

Wire	Jack
WHT-BLU	GRN
BLU-WHT	RED
WHT-ORN	BLK
ORN-WHT	YEL

CAUTION: FOR PROPER OPERATION, IT IS IMPORTANT THAT PAIR-FOR-PAIR CONNECTIONS BE MAINTAINED AND POLARITY OF PAIRS BE OBSERVED AT ALL LOCATIONS WHERE TERMINATIONS OR CROSS CONNECTIONS ARE MADE.

6.08 Install bridging clips for the AT, AR, BT and BR terminals.

CO LINE CONNECTIONS

6.09 The telephone company installs an RJ21X connector to which the KSU is connected. The RJ21X is installed within 25 feet of the KSU.

6.10 A 25-pair cable is plugged into the RJ21X connector at one end. The other end is plugged into the following connector:

Board	System	Connector
B-8MDU-A	24	A1
B-12MDU-A	36	A1
B-24MDU	64	A1

WARNING: ONLY FCC LICENSED PERSONNEL MAY INSTALL A CONNECTING BLOCK BETWEEN THE RJ21X AND THE KSU.

7. WIRING CHECK

7.01 After all PCBs have been installed but before the stations are installed, the following checks should be made.

7.02 Measure the DC voltage at each 625-type station block as follows:

Connect Voltmeter +/–	Voltage
Green/Red AT/AR	13 VDC (approximately)
Black/Yellow BT/BR	28 VDC (approximately)

NOTE: Start measurements from first station.

7.03 If these voltages are not obtained, check the station cabling and wiring from the Main Distribution Frame 66M1-50 block against the information shown on the cutdown sheets provided.

7.04 When the telephone is installed, the normal voltages at the AT/AR pair are:

12.8 VDC on hook at the KSU (block) or 625 Jack
7.4 VDC off hook at the KSU (block) or 625 Jack

Table 5-1 BUSINESSCOM PLUS 24 CUTDOWN

CLIP NO.	CONN. PIN	CABLE COLOR	BLOCK B1		BLOCK B2		BLOCK A1		BLOCK C1		BLOCK D1
1	26	WHT-BLU		AT		AT		1T	PF	1T	
2	1	BLU-WHT	PORT	AR	PORT	AR	LINE 1	1R	BELL 1	1R	DSS 1
3	27	WHT-ORN	10	BT	22	BT		2T	PF	2T	
4	2	ORN-WHT		BR		BR	LINE 2	2R	BELL 2	2R	DSS 2
5	28	WHT-GRN		AT		AT		3T	PF	3T	DOOR
6	3	GRN-WHT	PORT	AR	PORT	AR	LINE 3	3R	BELL 3	3R	BOX 1
7	29	WHT-BRN	11	BT	23	BT		4T	PF	4T	DOOR
8	4	BRN-WHT		BR		BR	LINE 4	4R	BELL 4	4R	BOX 2
9	30	WHT-SLT		AT		AT		5T	PF	5T	MOH
10	5	SLT-WHT	PORT	AR	PORT	AR	LINE 5	5R	BELL 5	5R	EXT IN
11	31	RED-BLU	12	BT	24	BT		6T	PF	6T	MOH
12	6	BLU-RED		BR		BR	LINE 6	6R	BELL 6	6R	CONTACTS
13	32	RED-ORN		AT		AT		7T	PF	7T	EXT.
14	7	ORN-RED	PORT	AR	PORT	AR	LINE 7	7R	BELL 7	7R	ZONE 1
15	33	RED-GRN	13	BT	25	BT		8T	PF	8T	EXT. ZONE 1
16	8	GRN-RED		BR		BR	LINE 8	8R	BELL 8	8R	CONTACTS
17	34	RED-BRN		AT		AT					EXT.
18	9	BRN-RED	PORT	AR	PORT	AR					ZONE 2
19	35	RED-SLT	14	BT	26	BT					EXT. ZONE 2
20	10	SLT-RED		BR		BR					CONTACTS
21	36	BLK-BLU		AT		AT					BGM
22	11	BLU-BLK	PORT	AR	PORT	AR					SOURCE
23	37	BLK-ORN	15	BT	27	BT					ALARM +
24	12	ORN-BLK		BR		BR					INPUT 1 –
25	38	BLK-GRN		AT		AT					ALARM +
26	13	GRN-BLK	PORT	AR	PORT	AR					INPUT 2 –
27	39	BLK-BRN	16	BT	28	BT					EXT. +
28	14	BRN-BLK		BR		BR					INPUT 3 –
29	40	BLK-SLT		AT		AT					EXT. +
30	15	SLT-BLK	PORT	AR	PORT	AR					INPUT 4 –
31	41	YEL-BLU	17	BT	29	BT					EXT. +
32	16	BLU-YEL		BR		BR					INPUT 5 –
33	42	YEL-ORN		AT		AT					EXT. +
34	17	ORN-YEL	PORT	AR	PORT	AR					INPUT 6 –
35	43	YEL-GRN	18	BT	30	BT					T28V +
36	18	GRN-YEL		BR		BR					TGD –
37	44	YEL-BRN		AT		AT					
38	19	BRN-YEL	PORT	AR	PORT	AR					
39	45	YEL-SLT	19	BT	31	BT					
40	20	SLT-YEL		BR		BR					
41	46	VIO-BLU		AT		AT					
42	21	BLU-VIO	PORT	AR	PORT	AR					
43	47	VIO-ORN	20	BT	32	BT					
44	22	ORN-VIO		BR		BR					
45	48	VIO-GRN		AT		AT					
46	23	GRN-VIO	PORT	AR	PORT	AR					
47	49	VIO-BRN	21	BT	33	BT					
48	24	BRN-VIO		BR		BR					
49	50	VIO-SLT									
50	25	SLT-VIO									

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Table 5-2 BUSINESSCOM PLUS 36 CUTDOWN

CLIP NO.	CONN. PIN	CABLE COLOR	BLOCK B1		BLOCK B2		BLOCK B3		BLOCK A1		BLOCK C1		BLOCK D1
1	26	WHT-BLU		AT		AT		AT		1T	PF	1T	
2	1	BLU-WHT	PORT	AR	PORT	AR	PORT	AR	LINE 1	1R	BELL 1	1R	DSS 1
3	27	WHT-ORN	10	BT	22	BT	34	BT		2T	PF	2T	
4	2	ORN-WHT		BR		BR		BR	LINE 2	2R	BELL 2	2R	DSS 2
5	28	WHT-GRN		AT		AT		AT		3T	PF	3T	DOOR
6	3	GRN-WHT	PORT	AR	PORT	AR	PORT	AR	LINE 3	3R	BELL 3	3R	BOX 1
7	29	WHT-BRN	11	BT	23	BT	35	BT		4T	PF	4T	DOOR
8	4	BRN-WHT		BR		BR		BR	LINE 4	4R	BELL 4	4R	BOX 2
9	30	WHT-SLT		AT		AT		AT		5T	PF	5T	MOH
10	5	SLT-WHT	PORT	AR	PORT	AR	PORT	AR	LINE 5	5R	BELL 5	5R	EXT IN
11	31	RED-BLU	12	BT	24	BT	36	BT		6T	PF	6T	MOH
12	6	BLU-RED		BR		BR		BR	LINE 6	6R	BELL 6	6R	CONTACTS
13	32	RED-ORN		AT		AT		AT		7T	PF	7T	EXT.
14	7	ORN-RED	PORT	AR	PORT	AR	PORT	AR	LINE 7	7R	BELL 7	7R	ZONE 1
15	33	RED-GRN	13	BT	25	BT	37	BT		8T	PF	8T	EXT. ZONE 1
16	8	GRN-RED		BR		BR		BR	LINE 8	8R	BELL 8	8R	CONTACTS
17	34	RED-BRN		AT		AT		AT		9T	PF	9T	EXT.
18	9	BRN-RED	PORT	AR	PORT	AR	PORT	AR	LINE 9	9R	BELL 9	9R	ZONE 2
19	35	RED-SLT	14	BT	26	BT	38	BT		10T	PF	10T	EXT. ZONE 2
20	10	SLT-RED		BR		BR		BR	LINE 10	10R	BELL 10	10R	CONTACTS
21	36	BLK-BLU		AT		AT		AT		11T	PF	11T	BGM
22	11	BLU-BLK	PORT	AR	PORT	AR	PORT	AR	LINE 11	11R	BELL 11	11R	SOURCE
23	37	BLK-ORN	15	BT	27	BT	39	BT		12T	PF	12T	ALARM +
24	12	ORN-BLK		BR		BR		BR	LINE 12	12R	BELL 12	12R	INPUT 1 –
25	38	BLK-GRN		AT		AT		AT					ALARM +
26	13	GRN-BLK	PORT	AR	PORT	AR	PORT	AR					INPUT 2 –
27	39	BLK-BRN	16	BT	28	BT	40	BT					EXT. +
28	14	BRN-BLK		BR		BR		BR					INPUT 3 –
29	40	BLK-SLT		AT		AT		AT					EXT. +
30	15	SLT-BLK	PORT	AR	PORT	AR	PORT	AR					INPUT 4 –
31	41	YEL-BLU	17	BT	29	BT	41	BT					EXT. +
32	16	BLU-YEL		BR		BR		BR					INPUT 5 –
33	42	YEL-ORN		AT		AT		AT					EXT. +
34	17	ORN-YEL	PORT	AR	PORT	AR	PORT	AR					INPUT 6 –
35	43	YEL-GRN	18	BT	30	BT	42	BT					T28 V+
36	18	GRN-YEL		BR		BR		BR					TGD –
37	44	YEL-BRN		AT		AT		AT					
38	19	BRN-YEL	PORT	AR	PORT	AR	PORT	AR					
39	45	YEL-SLT	19	BT	31	BT	43	BT					
40	20	SLT-YEL		BR		BR		BR					
41	46	VIO-BLU		AT		AT		AT					
42	21	BLU-VIO	PORT	AR	PORT	AR	PORT	AR					
43	47	VIO-ORN	20	BT	32	BT	44	BT					
44	22	ORN-VIO		BR		BR		BR					
45	48	VIO-GRN		AT		AT		AT					
46	23	GRN-VIO	PORT	AR	PORT	AR	PORT	AR					
47	49	VIO-BRN	21	BT	33	BT	45	BT					
48	24	BRN-VIO		BR		BR		BR					
49	50	VIO-SLT											
50	25	SLT-VIO											

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Table 5-3 BUSINESSCOM PLUS 64 CUTDOWN

CLIP NO.	CONN. PIN	CABLE COLOR	BLOCK B1		BLOCK B2		BLOCK B3		BLOCK B4		BLOCK B5		BLOCK B6		BLO
1	26	WHT-BLU		AT		AT		AT		AT		AT		AT	PF
2	1	BLU-WHT	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR	BELL
3	27	WHT-ORN	10	BT	22	BT	34	BT	46	BT	58	BT	70	BT	PF
4	2	ORN-WHT		BR		BR		BR		BR		BR		BR	BELL
5	28	WHT-GRN		AT		AT		AT		AT		AT		AT	PF
6	3	GRN-WHT	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR	BELL
7	29	WHT-BRN	11	BT	23	BT	35	BT	47	BT	59	BT	71	BT	PF
8	4	BRN-WHT		BR		BR		BR		BR		BR		BR	BELL
9	30	WHT-SLT		AT		AT		AT		AT		AT		AT	PF
10	5	SLT-WHT	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR	BELL
11	31	RED-BLU	12	BT	24	BT	36	BT	48	BT	60	BT	72	BT	PF
12	6	BLU-RED		BR		BR		BR		BR		BR		BR	BELL
13	32	RED-ORN		AT		AT		AT		AT		AT		AT	PF
14	7	ORN-RED	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR	BELL
15	33	RED-GRN	13	BT	25	BT	37	BT	49	BT	61	BT	73	BT	PF
16	8	GRN-RED		BR		BR		BR		BR		BR		BR	BELL
17	34	RED-BRN		AT		AT		AT		AT		AT			PF
18	9	BRN-RED	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR			BELL
19	35	RED-SLT	14	BT	26	BT	38	BT	50	BT	62	BT			PF
20	10	SLT-RED		BR		BR		BR		BR		BR			BELL
21	36	BLK-BLU		AT		AT		AT		AT		AT			PF
22	11	BLU-BLK	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR			BELL
23	37	BLK-ORN	15	BT	27	BT	39	BT	51	BT	63	BT			PF
24	12	ORN-BLK		BR		BR		BR		BR		BR			BELL
25	38	BLK-GRN		AT		AT		AT		AT		AT			PF
26	13	GRN-BLK	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR			BELL
27	39	BLK-BRN	16	BT	28	BT	40	BT	52	BT	64	BT			PF
28	14	BRN-BLK		BR		BR		BR		BR		BR			BELL
29	40	BLK-SLT		AT		AT		AT		AT		AT			PF
30	15	SLT-BLK	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR			BELL
31	41	YEL-BLU	17	BT	29	BT	41	BT	53	BT	65	BT			PF
32	16	BLU-YEL		BR		BR		BR		BR		BR			BELL
33	42	YEL-ORN		AT		AT		AT		AT		AT			PF
34	17	ORN-YEL	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR			BELL
35	43	YEL-GRN	18	BT	30	BT	42	BT	54	BT	66	BT			PF
36	18	GRN-YEL		BR		BR		BR		BR		BR			BELL
37	44	YEL-BRN		AT		AT		AT		AT		AT			PF
38	19	BRN-YEL	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR			BELL
39	45	YEL-SLT	19	BT	31	BT	43	BT	55	BT	67	BT			PF
40	20	SLT-YEL		BR		BR		BR		BR		BR			BELL
41	46	VIO-BLU		AT		AT		AT		AT		AT			PF
42	21	BLU-VIO	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR			BELL
43	47	VIO-ORN	20	BT	32	BT	44	BT	56	BT	68	BT			PF
44	22	ORN-VIO		BR		BR		BR		BR		BR			BELL
45	48	VIO-GRN		AT		AT		AT		AT		AT			PF
46	23	GRN-VIO	PORT	AR	PORT	AR	PORT	AR	PORT	AR	PORT	AR			BELL
47	49	VIO-BRN	21	BT	33	BT	45	BT	57	BT	69	BT			PF
48	24	BRN-VIO		BR		BR		BR		BR		BR			BELL
49	50	VIO-SLT													
50	25	SLT-VIO													

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BUSINESSCOM PLUS 24/36/64
ELECTRONIC KEY TELEPHONE SYSTEMS
SECTION 6, INSTALLATION OF OPTIONAL EQUIPMENT

CONTENTS PAGE

WARNING: USE A GROUNDED WRIST STRAP WHEN HANDLING ANY PCBs.

WARNING: BE SURE SYSTEM POWER IS OFF BEFORE REMOVING OR INSERTING ANY PCBs.

1. INTRODUCTION

1.01 The INSTALLATION OF OPTIONAL EQUIPMENT Section provides information on equipment and accessories required for optional features. Each section provides description and installation information.

2. DESCRIPTION

2.01 Installation of the following is detailed in this section:

Background Music (BGM)
Door Chime Box
DSS Console
External Alarm Signals To Stations
External Paging Contacts
External Paging Output
Music On Hold (MOH)
Music On Hold Contacts
Off-Premises Extension
Power Failure External Bells
Remote Busy Line Indication
Speakerphone
Wall-Mounting Installation

BACKGROUND MUSIC (BGM)

Introduction

This section provides information on the installation of Background Music. Background Music, which is a customer provided item, can be broadcast over station speakers and sent to external zones. It can also serve as a source for Music On Hold.

Installation (Figure 6-1)

Specifications:
Input Impedance: 600 OHMs
Input Level: Nominal 250 mV (-10dBm)
Maximum Input: 1 Volt RMS

(1) Connect inputs from BGM source to clips 21, 22 of the D1 block. (If BGM source is used as a source of MOH also, overlap approximately four inches of wire i.e., do not punch down wire at wire end. Punch down wire approximately four inches from the end.)
(2) If BGM is also used as a source for MOH, proceed with the following. (If not, proceed to step 3.) Punch down overlap from wire connected at clip 21 to clip 9. Punch down overlap from wire connected at clip 22 to clip 10.
(3) Adjust the level of BGM with VR 1 that is located on the B-HBU-A board.
(4) Program necessary information — Program 26.

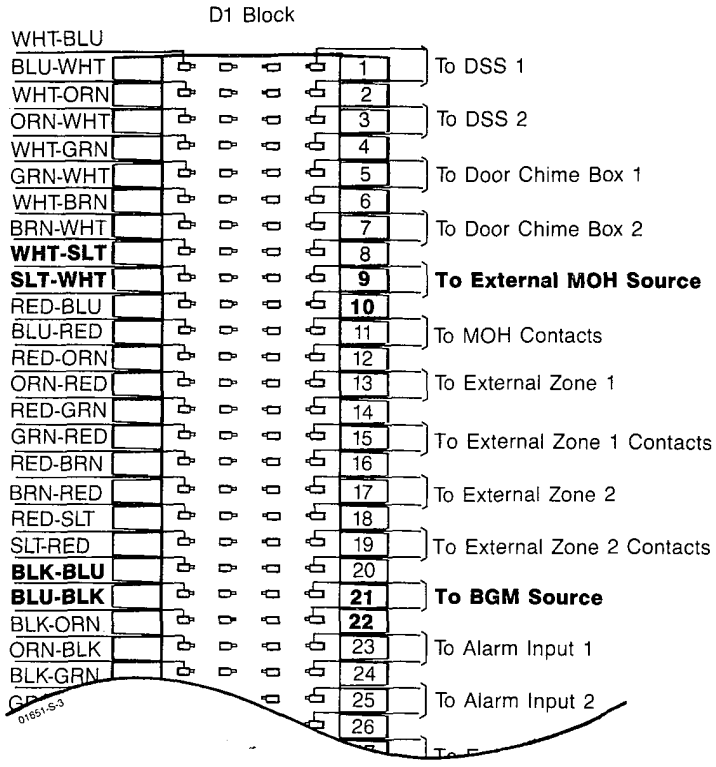

Figure 6-1 BACKGROUND MUSIC INSTALLATION

DOOR CHIME BOX

Introduction

This section provides information on the installation of the Door Chime Box. Two Door Chime Boxes are permitted.

Installation (Figure 6-2)

Specifications:
500 feet (152.4M) wire maximum of 24 AWG.

(1) Connect a wire to the terminal marked R on the back of the box. Connect the other end to clip 5 on the D1 block for box 1 or clip 7 for box 2.

(2) Connect a wire to the terminal marked C on the back of the box. Connect the other end to clip 6 on the D1 block for box 1 or clip 8 for box 2.

(3) SW1 on the B-DDU-A board must be in the proper position for the boxes to function. Located on SW1 are switches D1 and D2. If box 1 is used, move switch D1 to the position marked L1. If box 2 is used, move switch D2 to the position marked L1. If 2 boxes are used, move both D1 and D2 to the position marked L1.

(4) Adjust the audio level of the Door Chime Box(es) with VR 1 that is located on the B-DDU-A PCB.

(5) Program necessary information — Programs 12, 32.

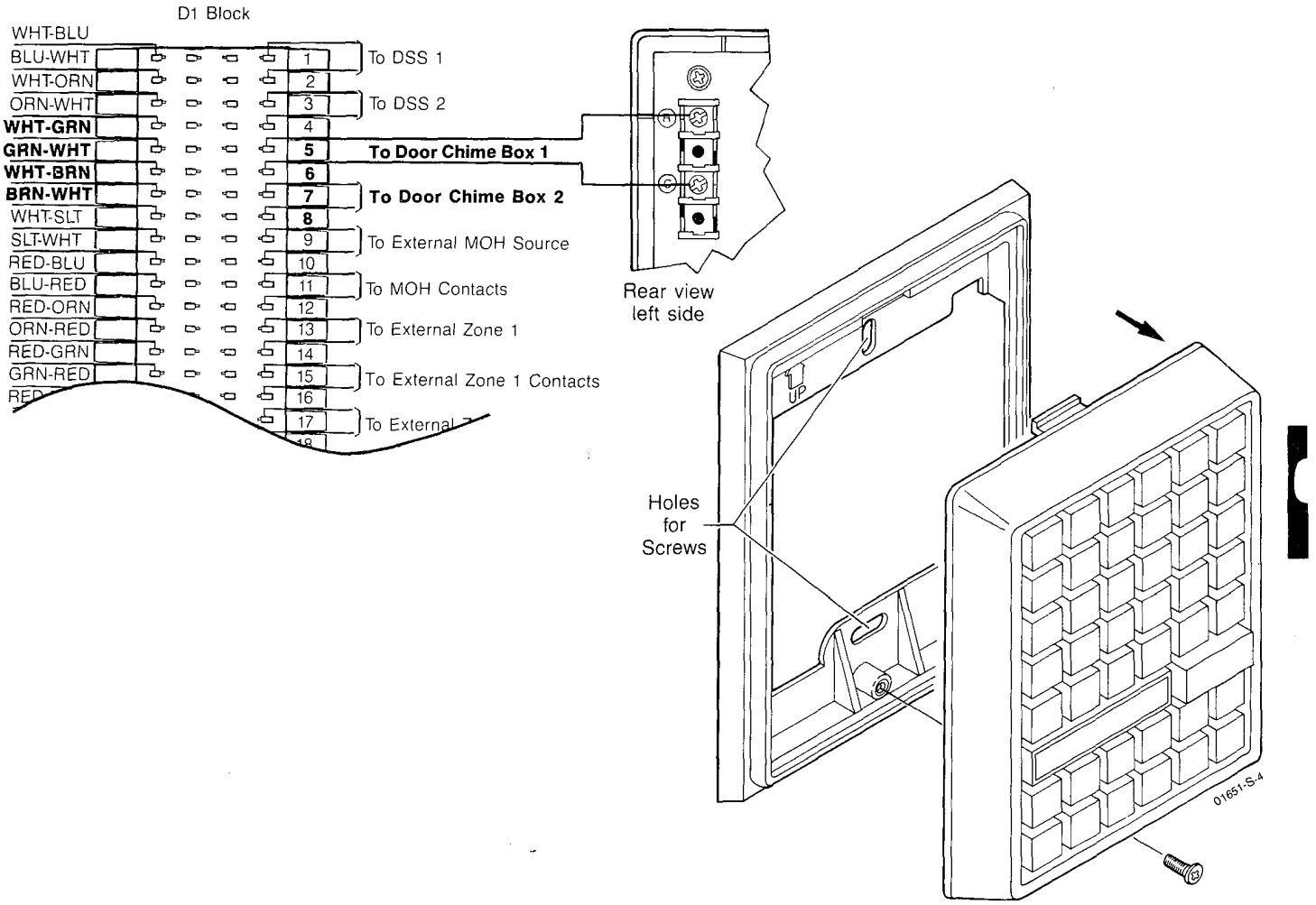

Figure 6-2 DOOR CHIME BOX INSTALLATION

DSS CONSOLE

Introduction

This section provides information on the installation of the DSS Console. The Businesscom Plus 24/36/64 systems can accommodate two consoles.

Installation (Figure 6-3)

Specifications:
1000 feet (304.8 M) maximum of 24 AWG. 500 feet (152.4 M) maximum of 24 AWG if two consoles are used and one is used as a Busy Lamp Field.

(1) Connect 2-pair twisted cable wires (only the WHT-BLU BLU-WHT wires) to the D1 block at clips 1, 2 for DSS Console 1. Connect 2-pair twisted cable wires (only the WHT-BLU and BLU-WHT wires) to the D1 block at clips 3, 4 for DSS Console 2. Connect the other ends of the wires to the appropriate modular jack. Connect the WHT-BLU wire to the terminal marked Red. Connect the BLU-WHT wire to the terminal marked Green.
(2) Plug one end of a line cord into a DSS Console and the other into the appropriate modular jack.
(3) Program necessary information — Programs 13, 39.

NOTE: DSS Console wiring is nonstandard.

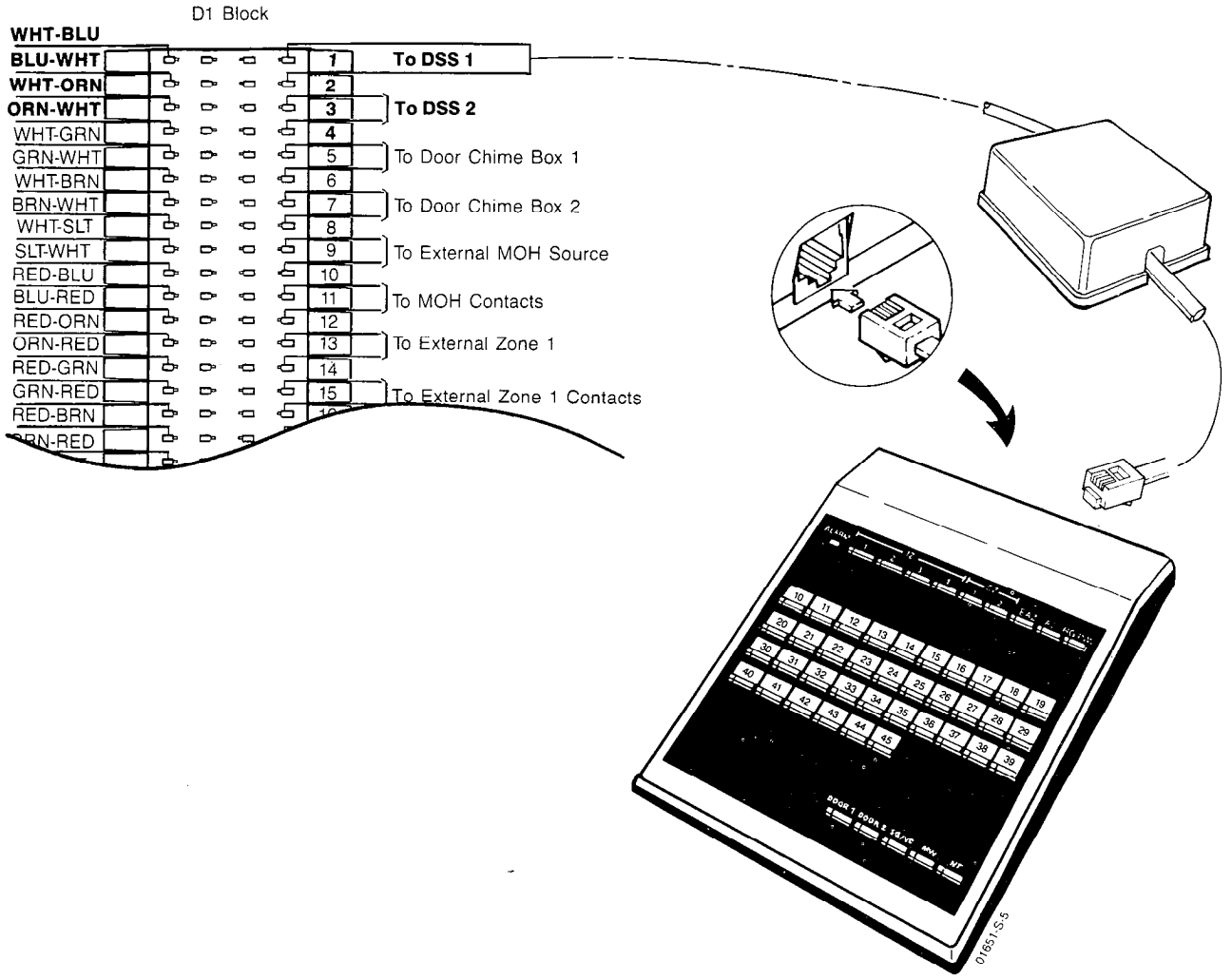

Figure 6-3 DSS CONSOLE INSTALLATION

EXTERNAL ALARM SIGNALS TO STATIONS

Introduction

This section provides information on the installation of an external alarm. Two alarms can be connected to the system. A B-HBU-A Series 3 PCB or later series is required.

Installation (Figure 6-4)

Specifications:
Loop Resistance: 1000 OHMS Max.

(1) Connect wires from external alarm 1 to terminals 23 and 24.
(2) Connect wires from external alarm 2 to terminals 25 and 26.
(3) Program necessary information — Programs 18, 28 and 53.

NOTE: Alarm inputs require an open circuit or a closed circuit to activate, depending on programming.

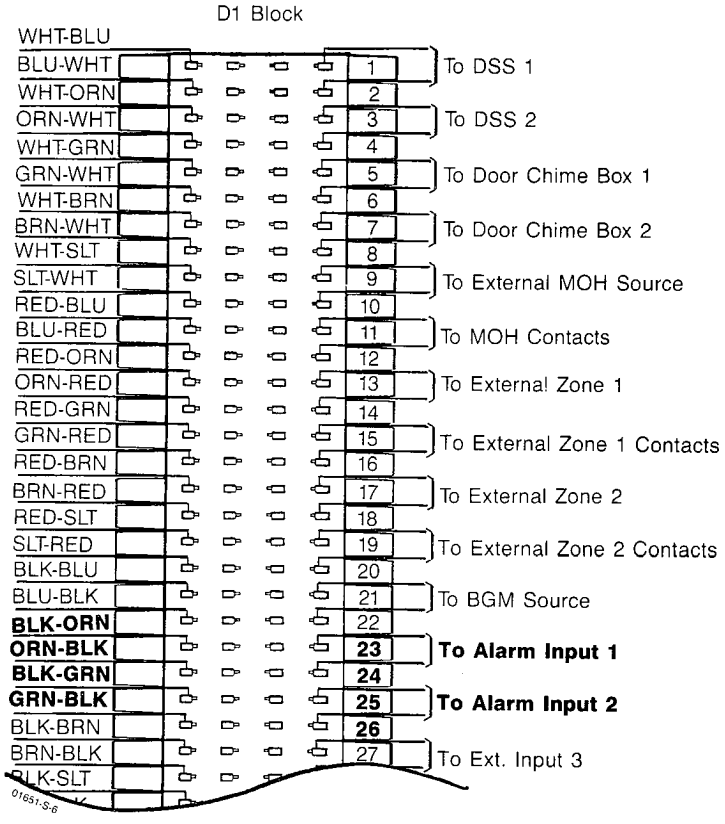

Figure 6-4 EXTERNAL ALARM SIGNALS TO STATIONS INSTALLATION

EXTERNAL PAGING CONTACTS

Description

This section provides information on the installation of external devices to External Paging Contacts. Normally open contacts are provided for external zones. When a zone is activated, the contacts close. When BGM is sent to a zone the contacts become continually closed. The relays for each zone are energized when Paging amplifiers are in use, including CO audible and BGM, if programmed. The relays are located on the B-GCU-A board.

Installation (Figure 6-5)

Specifications:
Current Rating: 1.25A for 24 VDC resistive loads

(1) Connect wires to clips 15, 16 on the D1 block for the first set of External Paging Contacts. Connect the other ends to appropriate device.
(2) Connect wires to clips 19, 20 on the D1 block for the second set of External Paging Contacts. Connect the other ends to appropriate device.
(3) Contacts remain closed for the duration of the page announcement for each respective external zone.

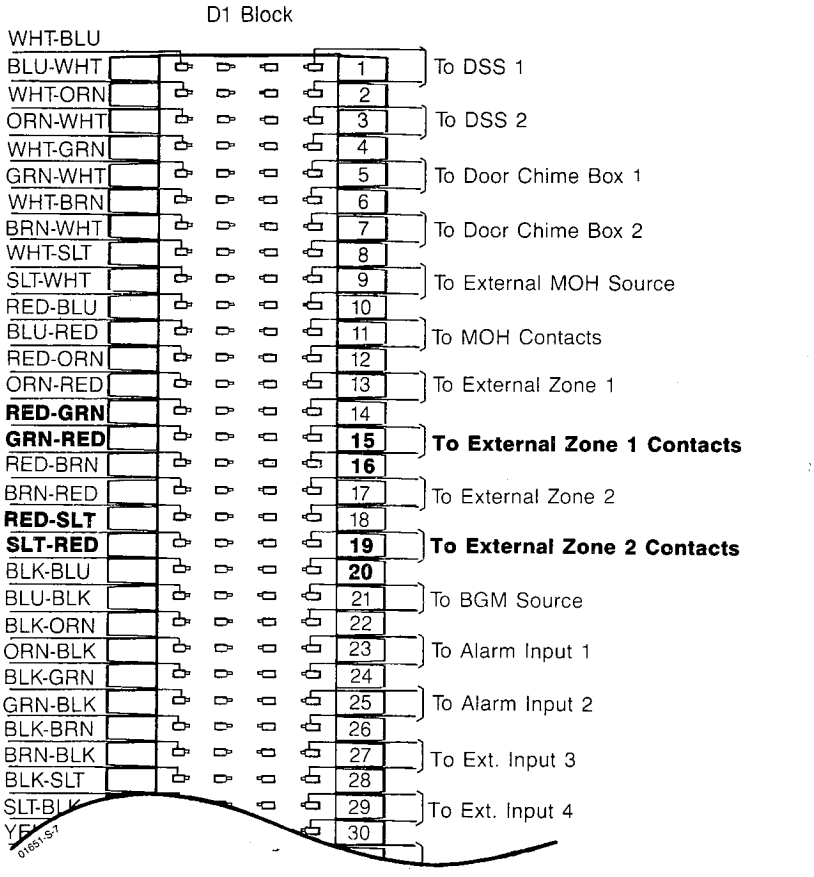

Figure 6-5 EXTERNAL PAGING CONTACTS WIRING

EXTERNAL PAGING OUTPUT

Introduction

This section provides information on the installation of external devices to external zones. External zones can receive CO audible, BGM, External Alarm Signals and Paging announcements. Speakers can be used to broadcast these signals at the zones.

Installation (Figure 6-6)

Specifications:
Output Impedance: 600 OHMs
Output Level: Nominal 250 mV (- 10 dBm)
Maximum Output: 400mV RMS

(1) Connect wires from clips 13, 14 on the D1 block to an amplifier for external zone 1. The amplifier inputs must match specifications above. Speaker attachment can now be made to your amplifier.
(2) Connect wires from clips 17, 18 on the D1 block to an amplifier for external zone 2. The amplifier inputs must match specifications above. Speaker attachment can now be made to your amplifier.
(3) Program necessary information — Programs 2, 18, 26 and 28.
(4) Adjust the volume level of external zone 1 with VR 1 that is located on the B-GCU-A PCB.
(5) Adjust the volume level of external zone 2 with VR 2 that is located on the B-GCU-A PCB.

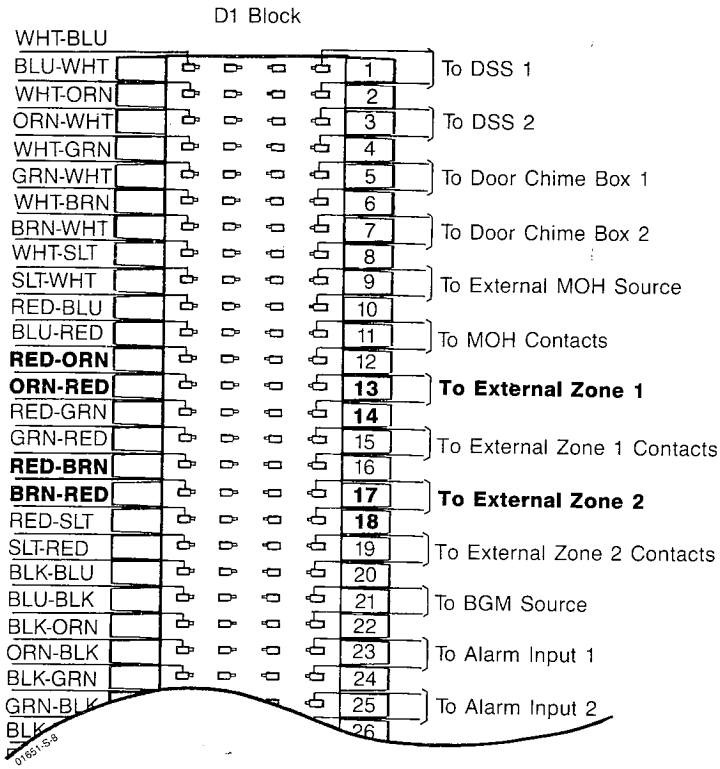

Figure 6-6 EXTERNAL PAGING OUTPUT WIRING

MUSIC ON HOLD (MOH)

Introduction

This section provides information on the installation of an external source of Music On Hold. Internally-synthesized Music On Hold is available with the system. However, an external source can be used as a substitute.

Installation (Figure 6-7)

Specifications:
Input Impedance: 600 OHMs
Input Level: Nominal 250 mV (- 10 dBm)
Maximum Level: 1 Volt RMS

(1) Connect inputs from an external MOH source to clips 9, 10 on the D1 block.
(2) SW1 on the B-TSU-A board is used to select either internal MOH or external MOH. If internal MOH is used, move SW1 to the position marked 1. If an external source is used, move SW1 to the opposite position.
(3) Adjust the audio level of MOH with VR 1 that is located on the B-TSU-A PCB.

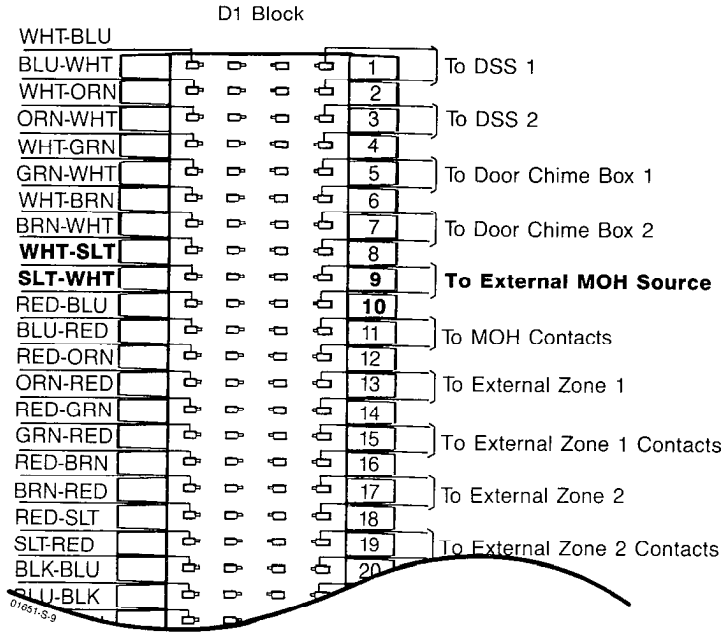

Figure 6-7 MUSIC ON HOLD (EXTERNAL) INSTALLATION

MUSIC ON HOLD CONTACTS

Introduction

This section provides information on the installation of an external device to Music On Hold Contacts. The B-HBU-A board has an auxiliary relay for MOH. This relay provides a closure for control of an audio source. The relay is energized whenever a call is placed on Hold.

Installation (Figure 6-8)

Specifications:
Current Rating: 1.25A for 24 VDC resistive loads

(1) Connect wires to clips 11, 12 on the D1 block. Connect the other ends to appropriate device.

OFF-PREMISES EXTENSION

(See Appendix C)

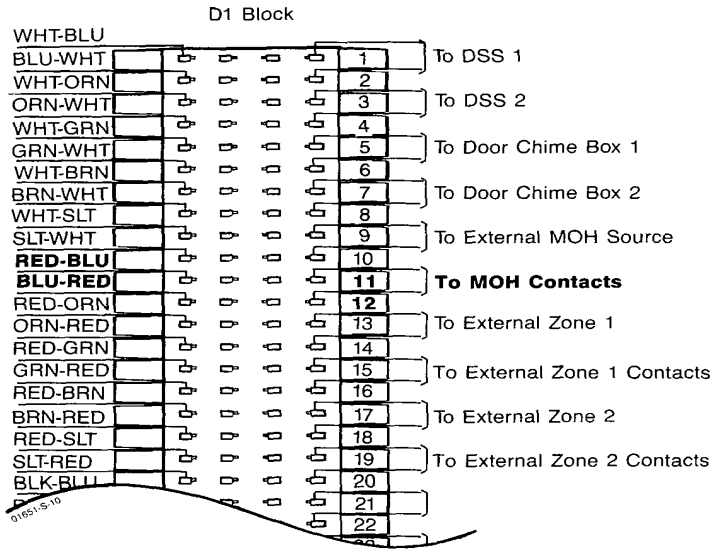

Figure 6-8 MUSIC ON HOLD CONTACTS WIRING

POWER FAILURE EXTERNAL BELLS

Description

This section provides information on the installation of Power Failure External Bells. Power Failure External Bells, which are customer provided items, provide ringing for incoming calls during AC power failure. Normal ringing is not maintained during a power failure. Power failure single line sets (500/2500) can be used in place of power failure bells.

NOTE: Only installers certified by the FCC are permitted to perform Power Failure strappings.

Installation (Figure 6-9)

(1) Connect external bell wires to the C1 block at clips 1, 2 for PF line 1, clips 3, 4 for PF line 2, clips 5, 6 for PF line 3, etc. (Tables 5-1 and 5-2).

(2) PFC straps must be bridged in the 1, 2 positions for each line installed. The PFC straps are located on the B-8MDU-A, B-12MDU-A, B-PFU-A PC boards located in the 24/36/64 KSUs, respectively. (See Figure 6-9 for Businesscom Plus 64 PCB.) The strappings are as follows:

BOARD 1		BOARD 2	
Strap	Line	Strap	Line
PFC 1, 2	1	PFC 1, 2	13
PFC 3, 4	2	PFC 3, 4	14
PFC 5, 6	3	PFC 5, 6	15
PFC 7, 8	4	PFC 7, 8	16
PFC 9, 10	5	PFC 9, 10	17
PFC 11, 12	6	PFC 11, 12	18
PFC 13, 14	7	PFC 13, 14	19
PFC 15, 16	8	PFC 15, 16	20
PFC 17, 18	9	PFC 17, 18	21
PFC 19, 20	10	PFC 19, 20	22
PFC 21, 22	11	PFC 21, 22	23
PFC 23, 24	12	PFC 23, 24	24

Cut Through Power Failure Operation

In power failure operation, lines cut through the following stations:

Line	Port	Line	Port
1	10	13	22
2	11	14	23
3	12	15	24
4	13	16	25
5	14	17	26
6	15	18	27
7	16	19	28
8	17	20	29
9	18	21	30
10	19	22	31
11	20	23	32
12	21	24	33

Businesscom Plus key telephones can provide answer-only operation during a power failure. Power Failure External Bells or ringers are required to provide an indication of an incoming call. A key telephone used for answer-only power failure service is connected to one specific line during power failure, and none of its keys or indications functions.

A standard 500/2500 type single line set can be temporarily installed to provide incoming and outgoing power failure operation at a power failure port. Power failure bells can be replaced with standard 500/2500 type single line sets for permanent power failure-only operation. Calls in progress when power fails or when power returns are lost.

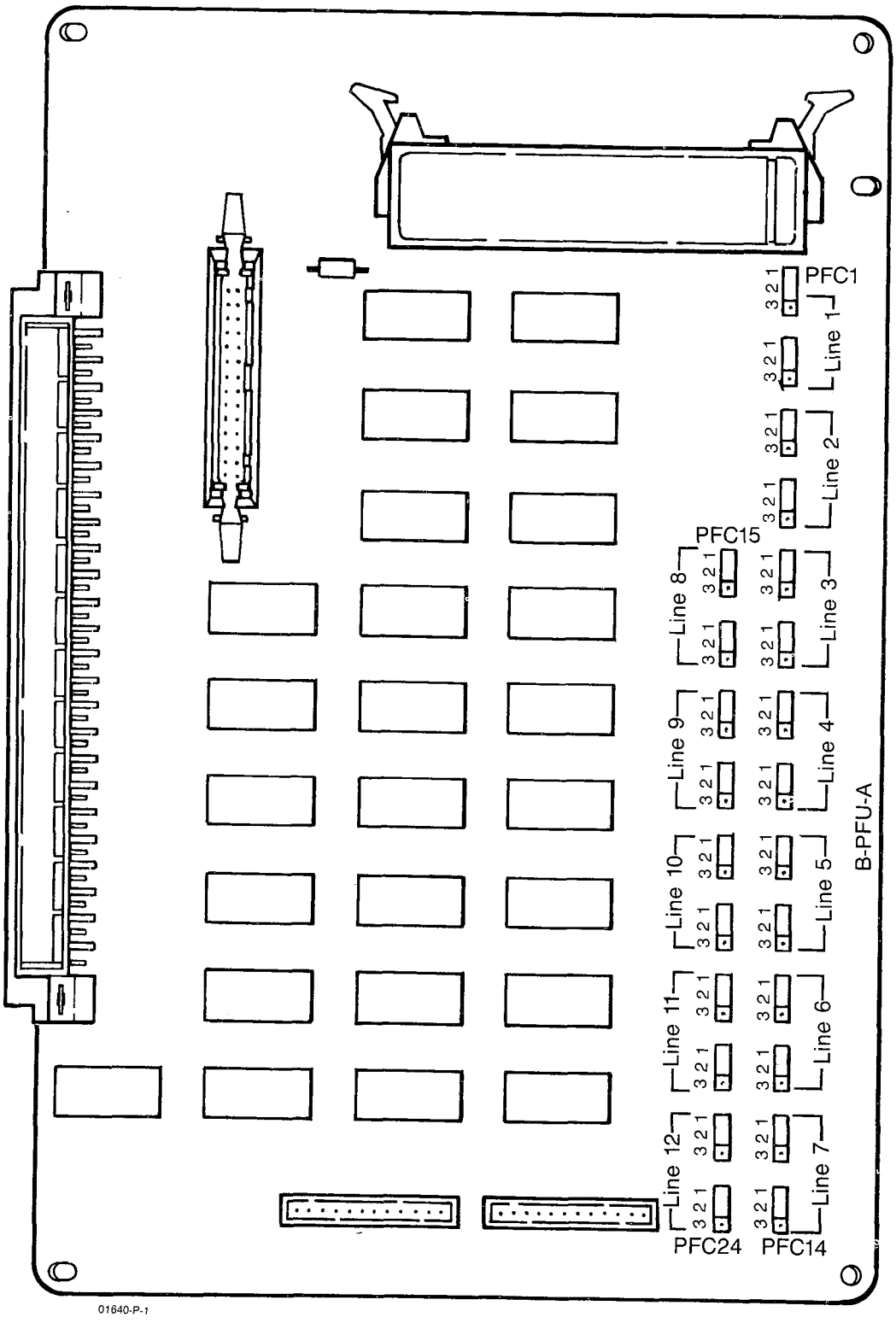

Figure 6-9 BUSINESSCOM PLUS 64 B-PFU-A PCB POWER FAILURE STRAPS

REMOTE BUSY LINE INDICATION (FAX)

Description:

The Remote Busy Line Indication interface provides busy-line indication when some remote device is using one of the lines connected to the system. This provides LED indication when the remote device is in the off-hook state. A B-HBU-A Series 3 or later is required to properly interface the equipment to the Businesscom Plus system. Programming is required for FAX Lines when they are installed in the system. Program 3, DISA Line, FAX Line, Common Use Line.

Installation (Figure 6-10):

Connect as follows:

NOTE: Ext. Inputs 3, 4, 5 or 6 can be used.

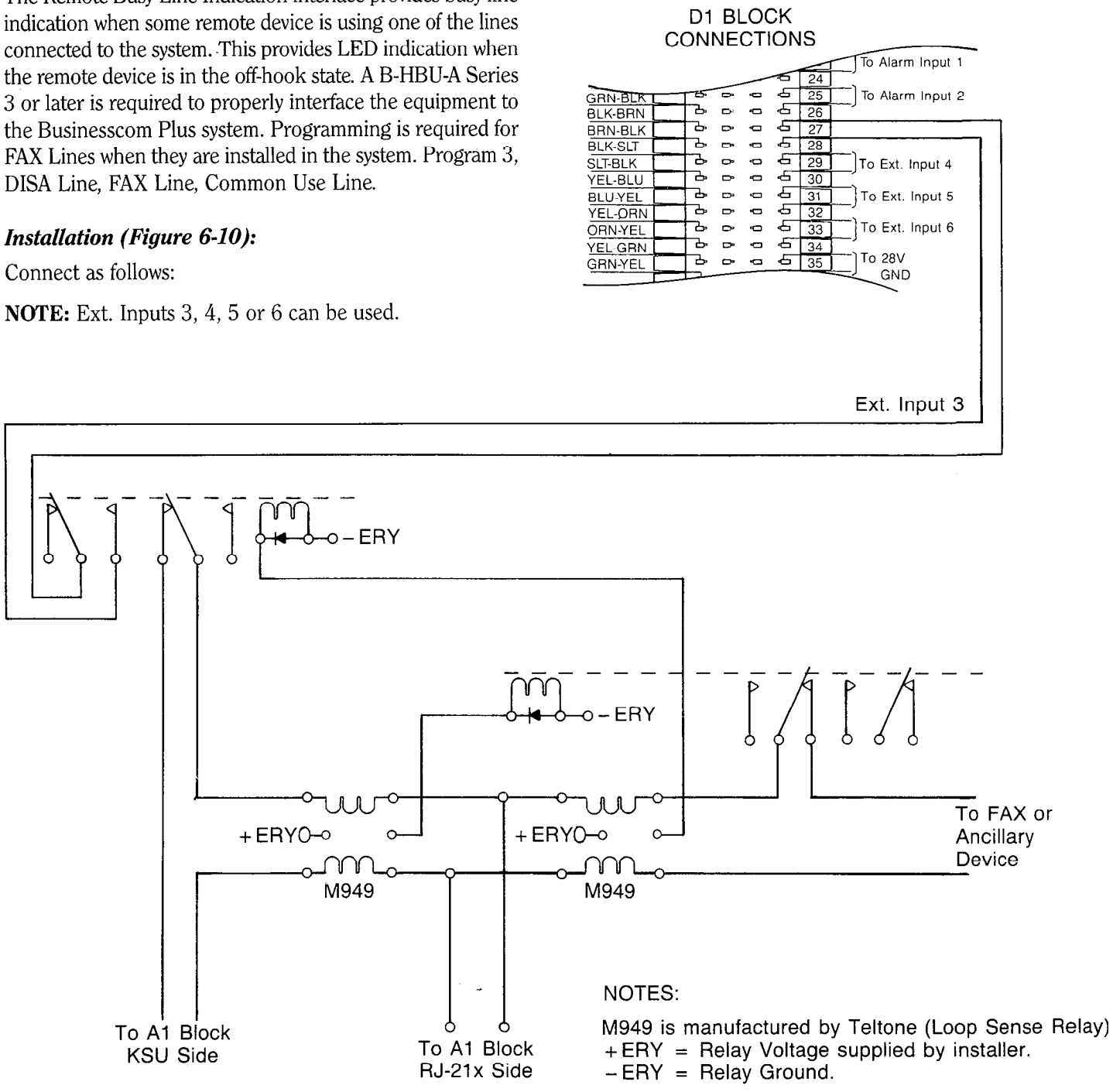

Figure 6-10 REMOTE BUSY LINE INDICATION (FAX) INSTALLATION

SPEAKERPHONE (B-SPDU-A PCB)

Description

This section provides information on the installation of Speakerphone PCBs. Executive Display telephones are factory equipped with speakerphones. Standard telephones are not factory equipped with speakerphones but speakerphones can be installed on these telephones. The maximum number of speakerphones permitted per system is as follows:

System	Maximum
24	12
36	12
64	24

Installation (Figure 6-11)

(1) Remove the two screws on the bottom of the telephone.
(2) Remove ribbon cable from connector C1 on B-TBU-A board along with the retaining screw. Remove board.
(3) Insert B-SPDU-A board and replace retaining screw.
(4) Insert ribbon cable into connector CN1 on B-SPDU-A board.
(5) Replace top of telephone and screws on bottom.

NOTE: Room acoustics (e.g., high ceilings, room material) and noise (e.g., background noise) can affect the proper operation of speakerphones. Care must be taken in the selection of the location for Speakerphone units.

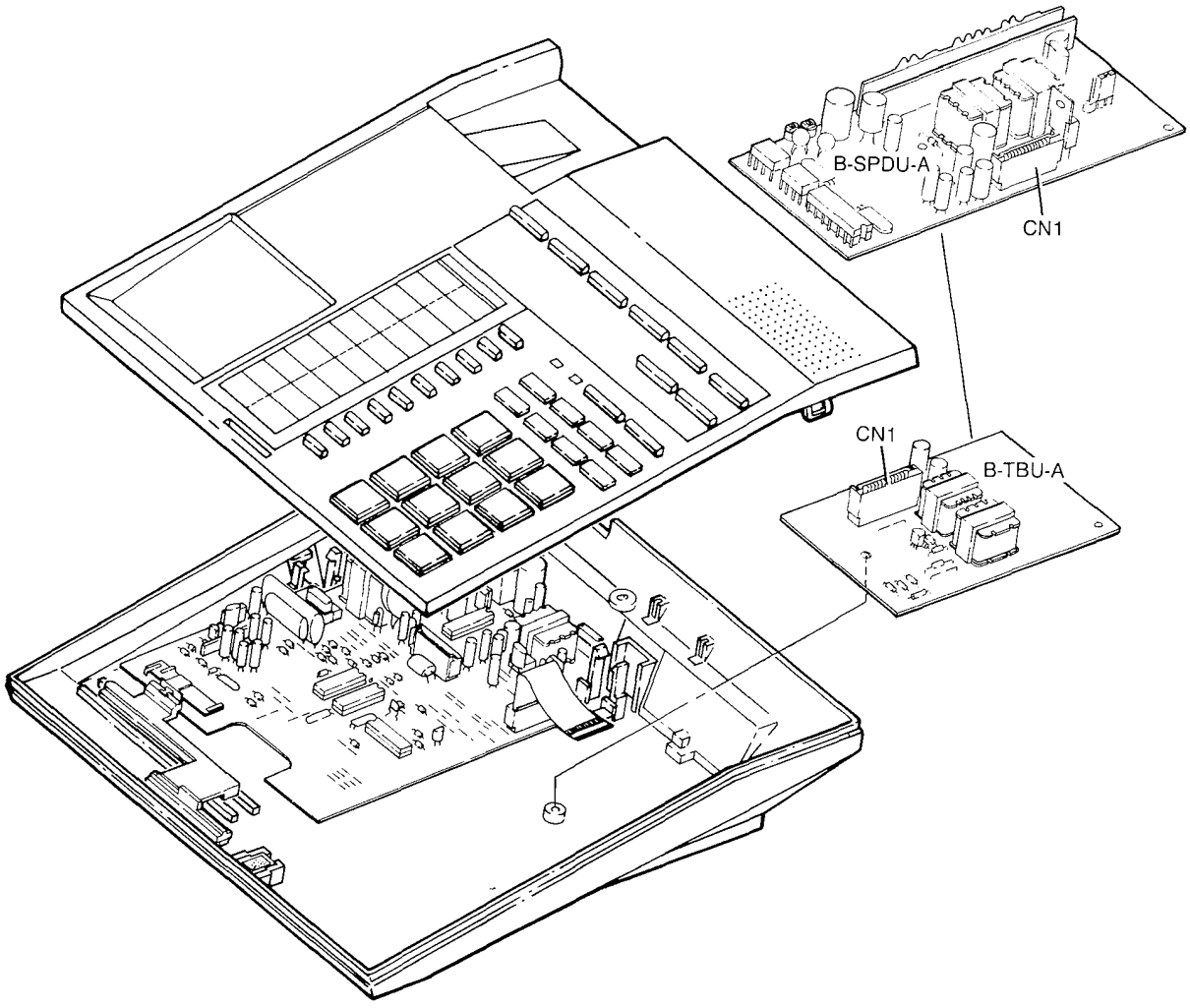

Figure 6-11 SPEAKERPHONE PCB INSTALLATION

WALL-MOUNTING INSTALLATION

Description

This section provides information on the installation of the Wall-Mounting Kit. Businesscom Plus telephones can be wall-mounted using this kit.

Installation (Figure 6-12)

(a) Wall-Mounting (without AT&T Wall Plate):

(1) The wall-mounting housing has four pilot holes. Insert the wood screws that are provided into the pilot holes.

(2) Insert the housing onto the base of the telephone. Four snap connectors are used for this.

(3) Connect the six-wire line cord that is supplied to the telephone on one end and the wall receptacle on the other.

(4) Install the handset hook.

(b) Wall-Mounting (to AT&T Wall Plate):

(1) Install the metal wall-mounting bracket. Four machine screws (supplied) are used to anchor the bracket to the housing.

(2) Insert the housing onto the base of the telephone. Four snap connectors are used for this.

(3) Connect the line cord that is supplied, to the telephone on one end and the wall receptacle on the other.

(4) Align telephone housing with two mounting pins on the wall plate.

(5) Pull down slightly on telephone to secure on pins.

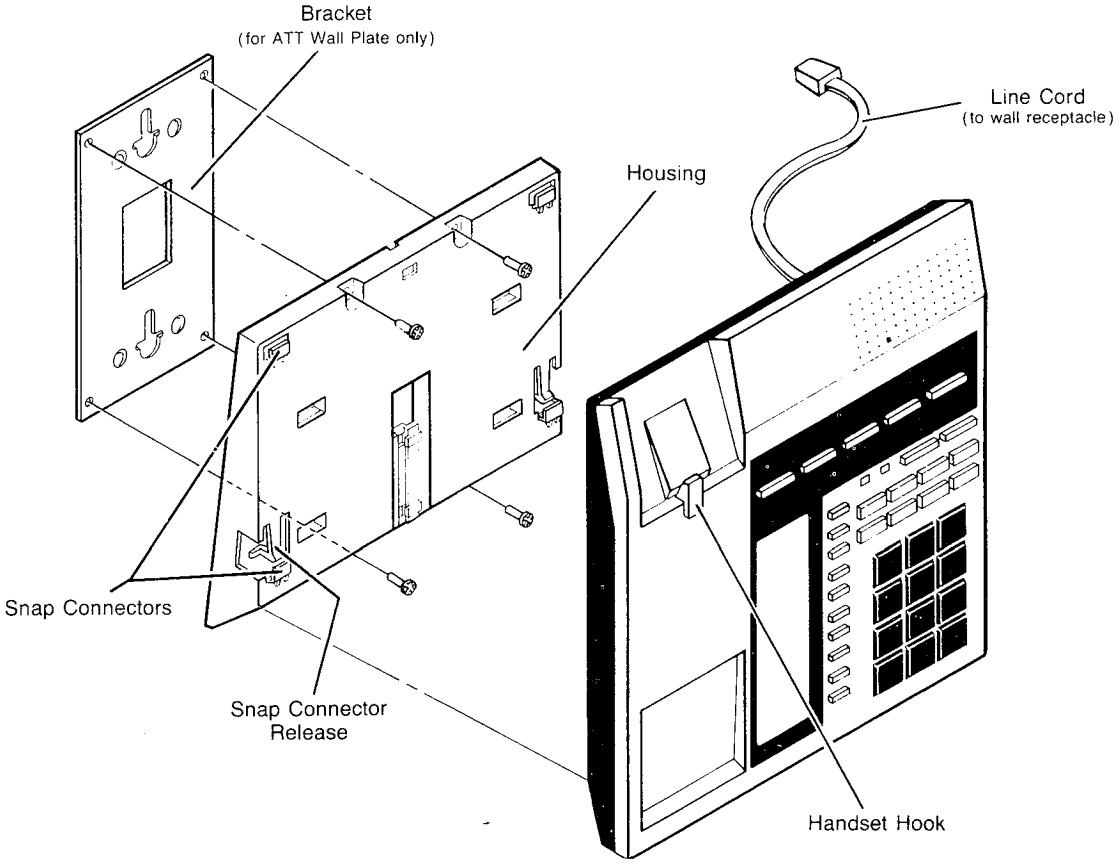

Figure 6-12 WALL-MOUNTING INSTALLATION

BUSINESSCOM PLUS 24/36/64
ELECTRONIC KEY TELEPHONE SYSTEMS
SECTION 7, PROGRAMMING

CONTENTS PAGE

1. INTRODUCTION

1.01 The PROGRAMMING Section provides the information necessary to program the system. The Program Record Form (PRF) provided in Appendix A is a convenient record that should be used for data entry along with this section.

2. DESCRIPTION

NOTE: All system programming must be done at port 10 with a display telephone. Not all field installations have a display telephone available.

2.01 The system provides three methods of data changes to memory:

(1) Initialization
(2) Programming
(3) Buffer Memory Erasure

Before programming, the system must be initialized.

2.02 The following steps must be followed for complete system initialization (see Figure 7-1):

(1) Disconnect lithium battery located on board B-MPU-A.
(2) Place the WR switch in the up position (i.e., initial position).
(3) Plug the power supply in and turn it on.
(4) Wait approximately 10 seconds then move the WR switch to the down position (i.e., normal).
(5) Plug in the lithium battery. Data are now protected against power failure.
(6) Press programming button as illustrated in Figure 7-2. Remove access door and use a blunt edged, non-conductive item to press the button.
(7) Run Program 91 as follows:
    (a) Enter program access code 91.
    (b) Press ✱.
    (c) Display: 91 A.
    (d) Press ✱
    (e) Press # to exit program.
    (f) Press programming button to exit programming mode.

    This program initializes the Speed Dial Number bins, resets the Alarm settings and loads default values under the telephone DSS keys.
(8) Press programming button to exit programming mode.

CAUTION: DO NOT RUN PROGRAM 91 AFTER PROGRAMMING IS COMPLETE. THIS PROGRAM NOT ONLY INITIALIZES THE SPEED DIAL NUMBER BINS BUT ALSO ERASES ALL SYSTEM SPEED DIAL NUMBERS.

CAUTION: DO NOT PERFORM STEPS A-F UPON SUBSEQUENT PROGRAMMING UNLESS SYSTEM REINITIALIZATION IS REQUIRED.

2.03 To prepare the system for data entry, the programming button must be pressed. Figure 7-2 illustrates the location of the button. To remove the programming access door gently press on the left side of the door. Use a thin non-conductive object to press the programming button. *Do not use a pointed object.* Press gently. Programming readiness is indicated when the date/time display extinguishes and a "00" appears on the display. When all programming is complete, press the button again. Exit from the programming mode is indicated when the date/time display again appears. Replace the cover.

NOTE: The system is functional during programming. The programming phone is *not.*

2.04 If at any time during programming the "*" button is pressed and subsequent data entry is denied, software limits have probably been exceeded. For instance, if station number 95 is entered, subsequent data for that station is denied. Station number 95 exceeds the maximum allowable limits of station number designations, 10-79.

2.05 When data entry is complete but programming exit is denied by the indication of an E on the display, a programming error was made. The use of Program 90 can help to locate the program which contains the error.

NOTE: The following are used throughout the programming section and are defined in the following manner: b—blank space, X—a digit.

2.06 It may be necessary to reinitialize a system. The following is used for just that situation. It cancels all but Speed Dial memory. To reinitialize the system proceed as follows:

NOTE: Do Not Disconnect Lithium Battery.

(1) Move WR switch to up position (i.e., initial position).
(2) Be sure power supply is off for at least 10 seconds.
(3) Wait approximately 10 seconds then move the WR switch to the down position (i.e., normal).
(4) Reprogram the system.

2.07 If at any time during programming it becomes necessary to erase data entered during a programming session, run Program 99. Data entered during a programming session are stored in a buffer. The data are moved to system memory upon programming exit. Program 99 erases only data stored in the buffer.

To cancel buffer data, proceed as follows:

(1) Enter program access code 99.
(2) Press *.
(3) Display: 99 C.
(4) Press * to exit programming mode.

All buffer data are now erased and the system is no longer in the programming mode. To enter new data, the programming mode must be reentered.

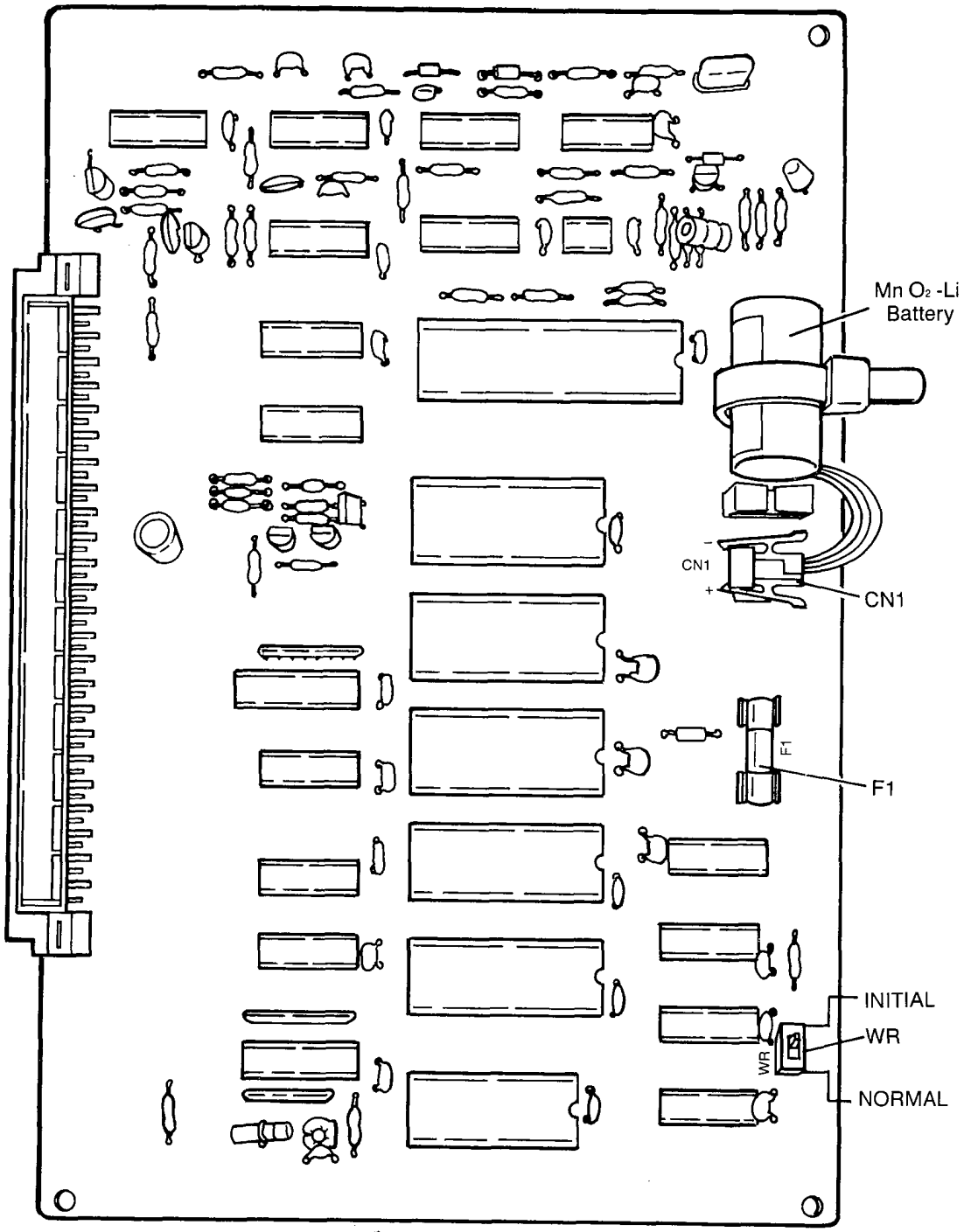

Figure 7-1 PROGRAMMING SWITCH—WR

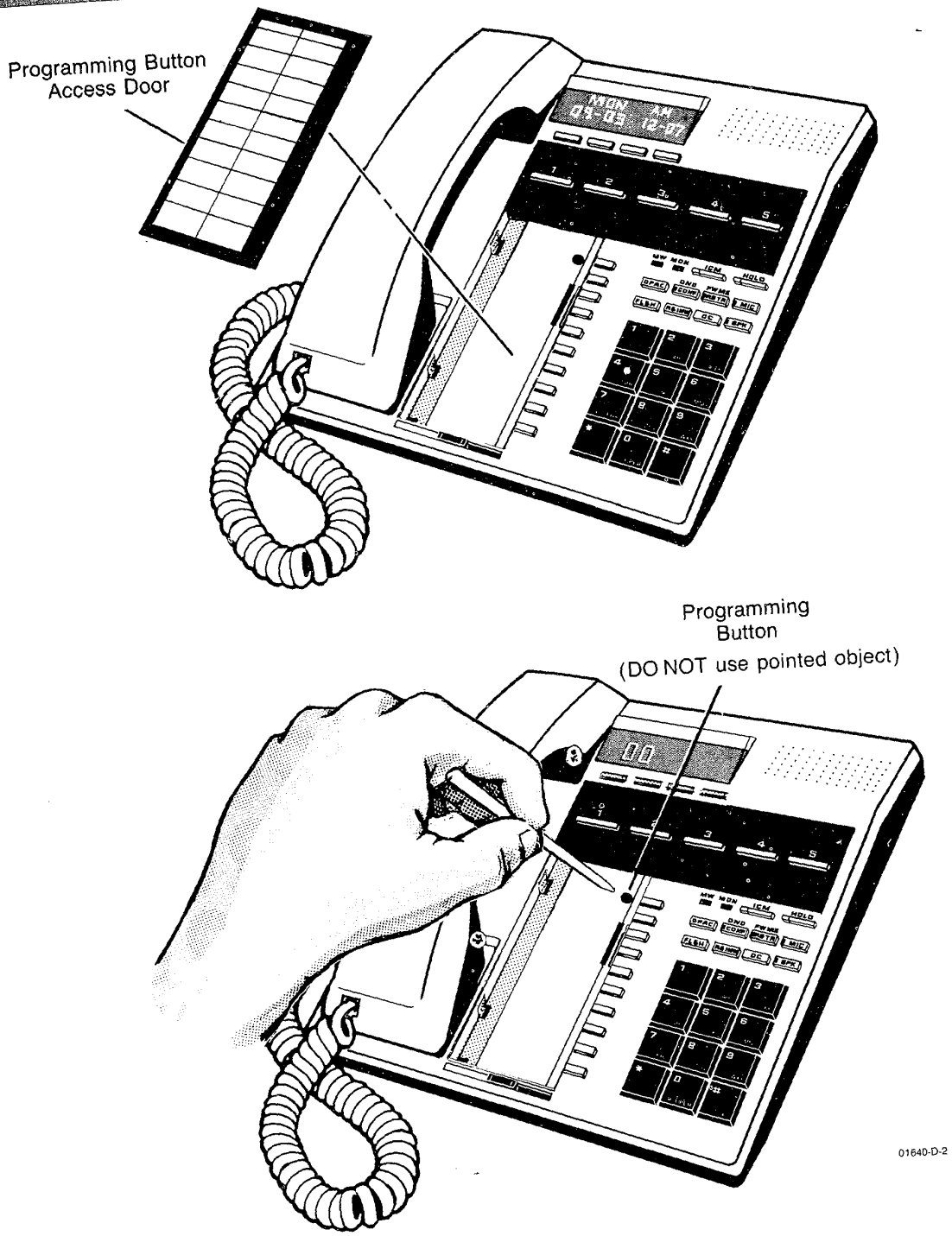

Figure 7-2 ENTERING THE PROGRAMMING MODE

PROGRAM 1: LINE TYPE, DIAL MODE, CO QUEUEING GROUP

(1) Enter program access code 01.
(2) Press ✱.
(3) Display: 01-00.
(4) Enter CO line number from A/B boxes.
(5) Press ✱.
(6) Display: 01-XX-XXXXX.
(7) Enter data from C/D/E/F/G boxes.
(8) Press ✱.
(9) Display: 01-XX-XXXXX.
(10) To enter data for next CO line, repeat steps 7 and 8.
(11) Press # to exit program.

PROGRAM 2: CO LINE GROUP ASSIGNMENTS

(1) Enter program access code 02.
(2) Press ✱.
(3) Display: 02-00.
(4) Enter CO group number from A/B boxes.
(5) Press ✱.
(6) Display: 02-XX-XX XX.
(7) Enter CO line number from C/D boxes.
(8) Press ✱.
(9) Display: 02-XX-XX-XX.
(10) Enter CO line number from E/F boxes.
(11) Press ✱.
(12) Display: 02-XX-XX-XX.
(13) Press ✱.
(14) To enter data for next CO line group, repeat steps 7 through 11.
(15) Press # to exit program.

PROGRAM 3: DISA LINE, FAX LINE, COMMON USE LINE

(1) Enter program access code 03.
(2) Press ✱.
(3) Display: 03-00.
(4) Enter CO line number from A/B boxes.
(5) Press ✱.
(6) Display: 03-XX-XXX.
(7) Enter data from C/D/E boxes.
(8) Press ✱.
(9) To add additional line data, repeat steps 7 and 8.
(10) Press # to exit program.

PROGRAM 4: EXECUTIVE OVERRIDE (BARGE IN)

(1) Enter program access code 04.
(2) Press ✱.
(3) Display: 04-00.
(4) Enter port number from A/B boxes.
(5) Press ✱.
(6) Display: 04-XX-X.
(7) Enter data from C box.
(8) Press ✱.
(9) To enter data for next port, repeat steps 7 and 8.
(10) Press # to exit program.

PROGRAM 5: UNSUPERVISED CONFERENCE

(1) Enter program access code 05.
(2) Press *.
(3) Display: 05-X.
(4) Enter the data from box A.
(5) Press *.
(6) Press # to exit program.

PROGRAM 6: CO LINE OUTWARD ACCESS ASSIGNMENT

(1) Enter program access code 06.
(2) Press *.
(3) Display: 06-00.
(4) Enter port number from A/B boxes.
(5) Press *.
(6) Display: 06-XX-XX XX.
(7) Enter CO group number from C/D boxes.
(8) Press *.
(9) Display: 06-XX-XX-XX.
(10) Enter CO group number from E/F boxes.
(11) Press *.
(12) To enter data for next port, repeat steps 7 through 11.
(13) Press # to exit program.

PROGRAM 7: CO LINE INCOMING/AUDIBLE ASSIGNMENT

(1) Enter program access code 07.
(2) Press *.
(3) Display: 07-00.
(4) Enter port number from A/B boxes.
(5) Press *.
(6) Display: 07-XX-1-XXX.
(7) Enter primary group number from C/D boxes.
(8) Enter primary group audible data from E box.
(9) Press *.
(10) Display: 07-XX-2-XXX.
(11) Enter secondary group number from F/G boxes.
(12) Enter secondary group audible data from H box.
(13) Press *.
(14) To enter data for next port, repeat steps 7 through 13.
(15) Press # to exit program.

PROGRAM 8: NIGHT CLASS OF SERVICE, CONFIRMATION TONE, INSTRUMENT TYPE, DO NOT DISTURB, PAGING GROUPS

(1) Enter program access code 08.
(2) Press *.
(3) Display: 08-00.
(4) Enter port number from A/B boxes.
(5) Press *.
(6) Display: 08-XX-XXXXX.
(7) Enter data from the C/D/E/F/G boxes.
(8) Press *.
(9) Display: 08-XX-XXXXX.
(10) To enter data for next port, repeat steps 7 and 8.
(11) Press # to exit program.

PROGRAM 9: EXECUTIVE CALL FORWARD

(1) Enter program access code 09.
(2) Press ✱.
(3) Display: 09-1-XX XX.
(4) Enter port number from A/B boxes.
(5) Press ✱.
(6) Display: 09-2-XX-XX.
(7) Enter port number from C/D boxes.
(8) Press ✱.
(9) To enter data for additional pairs, repeat steps 4 through 8.
(10) Press # to exit program.

PROGRAM 10: DUAL HANDSFREE HOTLINE

(1) Enter program access code 10.
(2) Press ✱.
(3) Display: 10-XX XX XX.
(4) Enter port number from A/B boxes.
(5) Press ✱.
(6) Display: 10-XX-XX XX.
(7) Enter port number from C/D boxes.
(8) Press ✱.
(9) Display: 10-XX-XX-XX.
(10) Enter port number from E/F boxes.
(11) Press ✱.
(12) Display: 10-XX XX XX.
(13) To enter data for additional pairs, repeat steps 4 through 11.
(14) Press # to exit program.

PROGRAM 11: GROUP HUNT

(1) Enter program access code 11.
(2) Press ✱.
(3) Display: 11-0.
(4) Enter hunting group number from A box.
(5) Press ✱.
(6) Display: 11-X 1-XX.
(7) Enter port number from B/C boxes.
(8) Press ✱.
(9) To enter data for additional ports, repeat steps 7 and
(10) To enter data for additional hunting groups, repeat ste 7 and 8. †
(11) Press # to exit program.

† If fewer than eight stations are entered into the previo group, press ✱ until the next group number appears on t display. Now repeat steps 7 and 8.

PROGRAM 12: DOOR CHIME BOX

(1) Enter program access code 12.
(2) Press ✱.
(3) Display: 12 01-XX.
(4) Enter port number from A/B boxes.
(5) Press ✱.
(6) Display: 12 02-XX.
(7) To enter additional ports, repeat steps 4 and 5.
(8) Press # to exit program.

PROGRAM 13: DSS CONSOLE PORT ASSIGNMENT

(1) Enter program access code 13.
(2) Press ✱.
(3) Display: 13-01-XX.
(4) Enter first DSS port number from A/B (bin 1) box
(5) Press ✱.
(6) Display: 13-02-XX.
(7) Enter second DSS port number from A/B (bin 2) box
(8) Press # to exit program.

PROGRAM 14: FLEXIBLE STATION NUMBER ASSIGNMENT †

(1) Enter program access code 14.
(2) Press *.
(3) Display: 14-00.
(4) Enter port number from A/B boxes.
(5) Press *.
(6) Display: 14-XX-XX.
(7) Enter port number from C/D boxes.
(8) Press *.
(9) Display: 14-XX-XX.
(10) To enter data for next port, repeat steps 7 and 8.
(11) Press # to exit program.

†It is recommended that this program be entered last to avoid confusion.

PROGRAM 15: FLEXIBLE LINE APPEARANCE

(1) Enter program access code 15.
(2) Press *.
(3) Display: 15-X.
(4) Enter data from A box.
(5) Press *.
(6) Press # to exit program.

PROGRAM 16: CO CALL WAITING

(1) Enter program access code 16.
(2) Press *.
(3) Display: 16-00.
(4) Enter port number from A/B boxes.
(5) Press *.
(6) Display: 16-XX-X.
(7) Enter data from C box.
(8) Press *.
(9) To enter data for next port, repeat steps 7 and 8.
(10) Press # to exit program.

PROGRAM 17: NIGHT TRANSFER

(1) Enter program access code 17.
(2) Press *.
(3) Display: 17-X.
(4) Enter data from A box.
(5) Press *.
(6) Press # to exit program.

PROGRAM 18: EXTERNAL PAGING OUTPUT

(1) Enter program access code 18.
(2) Press *.
(3) Display: 18-0.
(4) Enter zone data from A box.
(5) Press *.
(6) Display: 18-X-XX XXX.
(7) Enter CO group number from B/C boxes.
(8) Press *.
(9) Display: 18-X-XX-XXX.
(10) Enter data from D/E/F boxes.
(11) Press *.
(12) To enter data for next zone, repeat steps 7 through 11.
(13) Press # to exit program.

PROGRAM 19: ALL EXTERNAL ZONE PAGING

(1) Enter program access code 19.
(2) Press *.
(3) Display: 19-X.
(4) Enter data from A box.
(5) Press *.
(6) Press # to exit program.

PROGRAM 20: RINGING LINE PREFERENCE

(1) Enter program access code 20.
(2) Press *.
(3) Display: 20-X.
(4) Enter data from A box.
(5) Press *.
(6) Press # to exit program.

PROGRAM 22: EXCLUSIVE HOLD

(1) Enter program access code 22.
(2) Press ∗.
(3) Display: 22-X.
(4) Enter data from A box.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 23: INTERCOM CALL WAITING

(1) Enter program access code 23.
(2) Press ∗.
(3) Display: 23-00.
(4) Enter port number from A/B boxes.
(5) Press ∗.
(6) Display: 23-XX-X.
(7) Enter data from C box.
(8) Press ∗.
(9) To enter data for next port, repeat steps 7 and 8.
(10) Press # to exit program.

PROGRAM 24: VOICE ANNOUNCE/TONE SIGNAL CALL

(1) Enter program access code 24.
(2) Press ∗.
(3) Display: 24-X.
(4) Enter data from A box.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 25: MICROPHONE ON/OFF

(1) Enter program access code 25.
(2) Press ∗.
(3) Display: 25-X.
(4) Enter data from A box.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 26: BACKGROUND MUSIC

(1) Enter program access code 26.
(2) Press ∗.
(3) Display: 26-X.
(4) Enter data from A box.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 27: ROOM MONITOR

(1) Enter program access code 27.
(2) Press ∗.
(3) Display: 27-X.
(4) Enter data from A box.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 28: ALARM SENSOR

(1) Enter program access code 28.
(2) Press ∗.
(3) Display: 28-0.
(4) Enter alarm number from A box.
(5) Press ∗.
(6) Display: 28-X-X X.
(7) Enter data from B box.
(8) Press ∗.
(9) Display: 28-X-X-X.
(10) Enter data from C box.
(11) Press ∗.
(12) Display: 28-X-X X.
(13) To enter data for next alarm sensor, repeat steps 7 through 11.
(14) Press # to exit program.

PROGRAM 30: MULTI-LINE CONFERENCE

(1) Enter program access code 30.
(2) Press ∗.
(3) Display: 30-X.
(4) Enter data from A box.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 31: THREE MINUTE WARNING TONE

(1) Enter program access code 31.
(2) Press ∗.
(3) Display: 31-X.
(4) Enter data from A box.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 32: DOOR CHIME BOX SIGNAL

(1) Enter program access code 32.
(2) Press ∗.
(3) Display: 32-X.
(4) Enter data from A box.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 33: SINGLE STEP ACCESS

(1) Enter program access code 33.
(2) Press ∗.
(3) Display: 33-X.
(4) Enter data from A box.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 35: EXCLUSIVE HOLD RECALL

(1) Enter program access code 35.
(2) Press ∗.
(3) Display: 35-XXX.
(4) Enter data from A/B/C boxes.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 36: EXCLUSIVE HOLD RECALL DURATION

(1) Enter program access code 36.
(2) Press ∗.
(3) Display: 36-XXX.
(4) Enter data from A/B/C boxes.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 37: SYSTEM HOLD RECALL

(1) Enter program access code 37.
(2) Press ∗.
(3) Display: 37-XXX.
(4) Enter data from A/B/C boxes.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 38: CALL TRANSFER TIMER

(1) Enter program access code 38.
(2) Press ∗.
(3) Display: 38-XXX.
(4) Enter data from A/B/C boxes.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 39: DSS TRANSFER TIMER

(1) Enter program access code 39.
(2) Press ∗.
(3) Display: 39-XXX.
(4) Enter data from A/B/C boxes.
(5) Press ∗.
(6) Press # to exit program.

PROGRAM 40: CLASS OF SERVICE

(1) Enter program access code 40.
(2) Press ✱.
(3) Display: 40-00.
(4) Enter port number from A/B boxes.
(5) Press ✱.
(6) Display: 40-XX-X.
(7) Enter Class of Service data from C box.
(8) Press ✱.
(9) Display: 40-XX-X.
(10) To enter data for next port, repeat steps 7 and 8.
(11) Press # to exit program.

PROGRAM 41: PERMITTED CODES †

(1) Enter program access code 41.
(2) Press ✱.
(3) Display: 41-00.
(4) Enter data from A/B boxes.
(5) Press ✱.
(6) Display: bbbb. ††
(7) Enter Permitted Code data from C/D/E/F/G/H/I/J/K /L/M/N boxes.
(8) Display: XXXXXXXX. †††
(9) Press ✱.
(10) Display: 41-XX.
(11) To enter additional codes, repeat steps 4 through 7.
(12) Press # to exit program.

† The OPAC key can be used to erase a Permitted Code during its programming.

†† If data has been previously entered, it appears instead of blanks.

††† The display cannot exceed 8 digits. As more digits are added, the first entered are removed from display. To check a Permitted Code which exceeds 8 digits, enter the access code, press ✱ followed by the code designation, e.g., 01 is the first code. The first 8 digits are displayed. Press ✱ again. The remaining digits are displayed.

PROGRAM 42: PERMITTED CODE DIGITS

(1) Enter program access code 42.
(2) Press ✱.
(3) Display: 42-XX.
(4) Enter Permitted Code Digits data from A/B boxes.
(5) Press ✱.
(6) Press # to exit program.

PROGRAM 43: PRIVATE BRANCH EXCHANGE (PBX) ACCESS CODES †

(1) Enter program access code 43.
(2) Press ✱.
(3) Display: 43-0.
(4) Enter Code Number from A box.
(5) Press ✱.
(6) Display: 43-X-b. ††
(7) Enter Access Code data from B/C boxes.
(8) Press ✱.
(9) To enter next code, repeat steps 7 and 8.
(10) Press # to exit program.

† The OPAC key can be used to erase a PBX access coc during its programming.

†† If a PBX Access Code is already in software, display w read: 43-X-XX.

PROGRAM 44: COMMON UNRESTRICTED CODES †

(1) Enter program access code 44.
(2) Press ✱.
(3) Display: 44-0.
(4) Enter Code Number from A box.
(5) Press ✱.
(6) Display: 44-X-bbbb. ††
(7) Enter Common Unrestricted Code data from B/C/D/E boxes.
(8) Press ✱.
(9) To enter next code, repeat steps 7 and 8.
(10) Press # to exit program.

† The OPAC key can be used to erase a Common Unrestricted Code during its programming.

†† If a Common Unrestricted Code is already in software, display will read: 44-X-X... .

PROGRAM 45: DIGIT ABSORBING †

(1) Enter program access code 45.
(2) Press ✱.
(3) Display: 45-0.
(4) Enter Digit Absorbing Number from A box.
(5) Press ✱.
(6) Display: 45-X-b. ††
(7) Enter data from B box.
(8) Press ✱.
(9) Display: 45-X-b.
(10) To enter next digit, repeat steps 7 and 8.
(11) Press # to exit program.

† The OPAC key can be used to erase a Digit Absorbing entry during its programming.

†† If a digit number is already in software, display will read: 45-X-X.

PROGRAM 46: SECOND DIGIT RESTRICTION

(1) Enter program access code 46.
(2) Press ✱.
(3) Display: 46-X.
(4) Enter data from A box.
(5) Press ✱.
(6) Press # to exit program.

PROGRAM 47: RECALL LINE PREFERENCE

(1) Enter program access code 47.
(2) Press ✱.
(3) Display: 47-X.
(4) Enter data from A box.
(5) Press ✱.
(6) Press # to exit program.

PROGRAM 48: NIGHT CLASS OF SERVICE SELECTION

(1) Enter program access code 48.
(2) Press ✱.
(3) Display: 48-X.
(4) Enter data from A box.
(5) Press ✱.
(6) Press # to exit program.

PROGRAM 49: EXCLUDED SYSTEM FEATURES

(1) Enter program access code 49.
(2) Press ✱.
(3) Display: 49-0.
(4) Enter Function Group Number from A box.
(5) Press ✱.
(6) Display: 49-X-X.
(7) Enter data from B box.
(8) Press ✱.
(9) Display: 49-X-X.
(10) To enter data for the next Function Group Number, repeat steps 7 and 8.
(11) Press # to exit program.

PROGRAM 50: CALL DURATION TIMER

(1) Enter program access code 50.
(2) Press ✱.
(3) Display: 50-X.
(4) Enter data from A box.
(5) Press ✱.
(6) Press # to exit program.

PROGRAM 51: CALL DURATION START TIMER

(1) Enter program access code 51.
(2) Press ✱.
(3) Display: 51-XXX.
(4) Enter data from A/B/C boxes.
(5) Press ✱.
(6) Press # to exit program.

PROGRAM 52: PAGING SPLASH TONE

(1) Enter program access code 52.
(2) Press ✱.
(3) Display: 52-X.
(4) Enter data from A box.
(5) Press ✱.
(6) Press # to exit program.

PROGRAM 53: ALARM SIGNAL TONE

(1) Enter program access code 53.
(2) Press ✱.
(3) Display: 53-0.
(4) Enter port number from A/B boxes.
(5) Press ✱.
(6) Display: 53-XX-X.
(7) Enter data from C box.
(8) Press ✱.
(9) To enter data for next port, repeat steps 7 and 8.
(10) Press # to exit program.

PROGRAM 54: RELEASE OF ABANDONED CALLS ON HOLD

(1) Enter program access code 54.
(2) Press ✱.
(3) Display: 54-X.
(4) Enter data from A box.
(5) Press ✱.
(6) Press # to exit program.

PROGRAM 55: DO NOT DISTURB (DND) OVERRIDE BY DSS CONSOLE

(1) Enter program access code 55.
(2) Press ✱.
(3) Display: 55-X.
(4) Enter data from A box.
(5) Press ✱.
(6) Press # to exit program.

PROGRAM 56: FLASH TYPE/TIMING

(1) Enter program access code 56.
(2) Press ✱.
(3) Display: 56-0.
(4) Enter data from A box.
(5) Press ✱.
(6) Display: 56-X-XXX.
(7) Enter data from B/C/D boxes.
(8) Press ✱.
(9) To enter additional data, repeat steps 7 and 8.
(10) Press # to exit program.

PROGRAM 57: DIAL-PULSE SENDER SPEED

(1) Enter program access code 57.
(2) Press *.
(3) Display: 57-00.
(4) Enter CO Line number from A/B boxes.
(5) Press *.
(6) Display: 57-XX-X.
(7) Enter data from C box.
(8) Press *.
(9) To enter data for next CO line, repeat steps 7 and 8.
(10) Press # to exit program.

PROGRAM 58: MAKE/BREAK RATIO

(1) Enter program access code 58.
(2) Press *.
(3) Display: 58-X.
(4) Enter data from A box.
(5) Press *.
(6) Press # to exit program.

PROGRAM 60: CO AUDIBLE RATE ASSIGNMENT

(1) Enter program access code 60.
(2) Press *.
(3) Display: 60-00.
(4) Enter port number from A/B boxes.
(5) Press *.
(6) Display: 60-XX-X.
(7) Enter data from C box.
(8) Press *.
(9) To enter data for next port, repeat steps 7 and 8.
(10) Press # to exit program.

PROGRAM 61: CO AUDIBLE RATE ASSIGNMENT TIMER

(1) Enter programming access code 61.
(2) Press *.
(3) Display: 61-XXX.
(4) Enter data from A/B/C boxes.
(5) Press *.
(6) Display: 61-XXX.
(7) Press # to exit program.

PROGRAM 90: ERROR CHECK

(1) Enter program access code 90.
(2) Press *.
(3) Display: E—(error)
EO—(no error)
(4) Press *.
(5) Display: (if error) 90 XX †
(if no error) E0
(6) Press # to exit program.
(7) If error, enter access code of program in error. Re-enter data for that program according to program instructions.

† XX represents the number of the program which contains an error. Error here refers to an entry which exceeds the scope of software parameters.

PROGRAM 91: SPEED DIAL NUMBER INITIALIZATION

(1) Enter program access code 91.
(2) Press *.
(3) Display: 91 A.
(4) Press *.
(5) Press # to exit program.

PROGRAM 99: PROGRAMMING CANCELATION

(1) Enter program access code 99.
(2) Press *.
(3) Display: 99 C.
(4) Press * to exit programming mode.

BUSINESSCOM PLUS 24/36/64
ELECTRONIC KEY TELEPHONE SYSTEMS
SECTION 8, MAINTENANCE

CONTENTS PAGE

1. INTRODUCTION

1.01 The MAINTENANCE Section deals with trouble-shooting. It should be used in conjunction with the INSTALLATION Section.

2. DESCRIPTION

2.01 The first part of this section deals with telephone troubleshooting, while the second part deals with system troubleshooting.

2.02 It is not necessary to test each individual telephone with the test procedure (it is meant only as an aid to troubleshooting).

WARNING: BE SURE POWER IS OFF BEFORE DISCONNECTING OR CONNECTING POWER SUPPLY TO KSU OR INSTALLING OR REMOVING PCBs.

3. TELEPHONE TROUBLESHOOTING

3.01 Table 8-1 is a troubleshooting procedure fo telephones. When the procedure is finished, be sur to unplug and replug the telephone again before normal use

4. TELEPHONE TROUBLESHOOTING (without a meter)

4.01 The following is a troubleshooting guide for systen installations.

SYMPTOMS	POSSIBLE CAUSE
No LEDs light on phone. Phone will not function. Talk battery in handset.	Pairs reversed (jack wires)
No LEDs light on phone. Phone will not function. Talk battery in handset.	Pairs split (BLK-GRN reversed)
No LEDs light on phone. Phone will not function. Talk battery in handset.	Pairs split (RED-YEL reversed)
Phone functions. Cannot be called handsfree. Handset mode works fine.	GRN-RED (reversed) **NOTE:** Audio pair is polarity sensitive.
No sidetone or audio in handset or speaker. All keys and LEDs functional.	GRN-RED (open)
Talk battery in handset. Keys and LEDs not functional.	BLK-YEL (reversed or open)

Table 8-1 TELEPHONE TEST PROCEDURE

NO.	ITEM	OPERATION	INDICATION	NOTE
	Power on	Plug in modular connector while depressing programming switch.		
1.	RAM check		OK: Tone A (600/450/16Hz) NG: Tone C (600Hz) or no tone * If NG, selftest does not advance.	
2.	Off-hook	Raise handset	Tone A: stop	
3.	CO Line key	Press CO key	Corresponding Red LED : on	
		Press CO key after pressing TIMER key	Corresponding Red LED : on	*
		Press CO key after pressing CLOCK key	Corresponding Green LED : on	*
4.	DSS key (1-10)	Press DSS keys (1-10)	Binary coded indication on CO1-CO4 LEDs	
5.	Dial key	Press keys 1-7	Binary coded indication on CO1-CO4 LEDs	†
			Indicate on LCD	*
		Press key 8	Tone B (450/16Hz)	
		Press key 9	Tone C (600Hz)	
		Press key *	Mute tone C	
		Press key 0	Tone C	
		Press key #	Tone off	
6.	ALARM key	Press ALARM	All LCD segments : on	*
7.	CHECK key	Press CHECK	All LCD segments : off	*
8.	Function keys check	Press MIC	MIC LED : on	
		Press RG·INW	MON LED : on	
		Press CONF	DND LED : on	
		Press RG·TR	RG TR LED : on	
		Press DC	RG TR LED : off	
		Press ICM	ICM LED : on	
		Press HOLD	HOLD LED : on	
		Press OPAC	MW LED : on	
		Press SPK	SPK LED : on	
		Press FLASH	SPK LED : off	
At end, unplug phone and replug.				

* Omit this step for Standard telephones (non-Display).
† LEDs on Standard telephones light. Display telephone LEDs do not light.

T1651IM.8-1

5. POWER SUPPLY FUSES

WARNING: FOR PROTECTION AGAINST RISK OF FIRE, REPLACE FUSES ONLY WITH FUSES OF THE SAME TYPE AND RATING.

5.01 The following details the fuses in the Power Supply, their functions and their corresponding indications:

24/36 POWER SUPPLY		
Fuse	**Function**	**Indication of Failure**
3.0A (F0)	Power Supply Protection	Green Neon Lamp and all Power Supply LEDs extinguished
0.3A (F1)	Transformer Thermal Fuse Protection (located in Control Circuit)	All Power Supply LEDs extinguished
3.0A (F2)	Battery Protection	BAT LED extinguished
1.6A (F3)	5 Volt Supply Protection	5V LED extinguished
0.5A (F4)	12 Volt Supply Protection	12V LED extinguished
1.6A (F5)	28 Volt Supply Protection for Audio	A28V LED extinguished
3.0A (F6)	28 Volt Supply Protection for Telephones (1)	1-T28V LED extinguished
3.0A (F7)	28 Volt Supply Protection for Telephones (2)	2-T28V LED extinguished
	64 POWER SUPPLY	
6.0A (F0)	Power Supply Protection	Green Neon Lamp and all Power Supply LEDs extinguished
1.0A (F1)	Transformer Thermal Fuse Protection (located in Control Circuit)	All Power Supply LEDs extinguished
3.0A (F2)	Battery Protection	BAT LED extinguished
1.6A (F3)	5 Volt Supply Protection	5V LED extinguished
0.5A (F4)	12 Volt Supply Protection	12V LED extinguished
3.0A (F5)	28 Volt Supply Protection for Audio	A28V LED extinguished
3.0A (F6)	28 Volt Supply Protection for Telephones (1)	1-T28V LED extinguished
3.0A (F7)	28 Volt Supply Protection for Telephones (2)	2-T28V LED extinguished
3.0A (F8)	28 Volt Supply Protection for Telephones (3)	3-T28V LED extinguished
3.0A (F9)	28 Volt Supply Protection for Telephones (4)	4-T28V LED extinguished

C1651IM.1a

BUSINESSCOM PLUS 24/36/64
ELECTRONIC KEY TELEPHONE SYSTEMS
APPENDIX A
PROGRAM RECORD FORM

PROGRAM RECORD FORM

* A number outside and adjacent to box is a bin number. Programs 7, 9, 11, 12 and 13 have such bin numbers.

Program 1, Line Type, Dial Mode, CO Queueing Group

A	B	C	D	E	F	G
0	1					
0	2					
0	3					
0	4					
0	5					
0	6					
0	7					
0	8					
0	9					
1	0					
1	1					
1	2					
1	3					
1	4					
1	5					
1	6					
1	7					
1	8					
1	9					
2	0					
2	1					
2	2					
2	3					
2	4					

Initialized Values:
Line Type - 1
Dial Mode - 1
CO Queueing Group - 1
Not used - 0
Not used - 0

Program 2, CO Line Group Assignments

A	B	C	D	E	F
0	1				
0	2				
0	3				
0	4				
0	5				
0	6				
0	7				
0	8				
0	9				
1	0				
1	1				
1	2				
1	3				
1	4				
1	5				
1	6				
1	7				
1	8				
1	9				
2	0				
2	1				
2	2				
2	3				
2	4				
2	5				
2	6				
2	7				
2	8				
2	9				
3	0				

Initialized Values:
All lines in group 1

Program 3, DISA Line, FAX Line, Common Use Line

A	B	C	D	E
0	1			
0	2			
0	3			
0	4			
0	5			
0	6			
0	7			
0	8			
0	9			
1	0			
1	1			
1	2			
1	3			
1	4			
1	5			
1	6			
1	7			
1	8			
1	9			
2	0			
2	1			
2	2			
2	3			
2	4			

Initialized Values:
DISA Line - 0
FAX Line - 0
Common Use Line - 0

Program 4, Executive Override

Initialized Values: Executive Override - 0 for all ports

A	B	C
1	0	
1	1	
1	2	
1	3	
1	4	
1	5	
1	6	
1	7	
1	8	
1	9	
2	0	
2	1	
2	2	
2	3	
2	4	
2	5	
2	6	
2	7	
2	8	
2	9	
3	0	
3	1	
3	2	
3	3	
3	4	
3	5	
3	6	
3	7	
3	8	
3	9	
4	0	
4	1	

A	B	C
4	2	
4	3	
4	4	
4	5	
4	6	
4	7	
4	8	
4	9	
5	0	
5	1	
5	2	
5	3	
5	4	
5	5	
5	6	
5	7	
5	8	
5	9	
6	0	
6	1	
6	2	
6	3	
6	4	
6	5	
6	6	
6	7	
6	8	
6	9	
7	0	
7	1	
7	2	
7	3	

Program 5, Unsupervised Conference

A

☐

Initialized Values:
Unsupervised Conference - 0

Program 6, CO Line Outward Access Assignment

Initialized Values: Line group 1 assigned to all ports

A	B	C	D	E	F
1	0				
1	1				
1	2				
1	3				
1	4				
1	5				
1	6				
1	7				
1	8				
1	9				
2	0				
2	1				
2	2				
2	3				
2	4				
2	5				
2	6				
2	7				
2	8				
2	9				
3	0				
3	1				
3	2				
3	3				
3	4				
3	5				
3	6				
3	7				
3	8				
3	9				
4	0				
4	1				

A	B	C	D	E	F
4	2				
4	3				
4	4				
4	5				
4	6				
4	7				
4	8				
4	9				
5	0				
5	1				
5	2				
5	3				
5	4				
5	5				
5	6				
5	7				
5	8				
5	9				
6	0				
6	1				
6	2				
6	3				
6	4				
6	5				
6	6				
6	7				
6	8				
6	9				
7	0				
7	1				
7	2				
7	3				

Program 7, CO Line Incoming/Audible Assignment

Initialized Values: Line group 1 assigned to all ports
Only port 10 granted day/night audible

A	B	*	C	D	E	*	F	G	H
1	0	1				2			
1	1	1				2			
1	2	1				2			
1	3	1				2			
1	4	1				2			
1	5	1				2			
1	6	1				2			
1	7	1				2			
1	8	1				2			
1	9	1				2			
2	0	1				2			
2	1	1				2			
2	2	1				2			
2	3	1				2			
2	4	1				2			
2	5	1				2			
2	6	1				2			
2	7	1				2			
2	8	1				2			
2	9	1				2			
3	0	1				2			
3	1	1				2			
3	2	1				2			
3	3	1				2			
3	4	1				2			
3	5	1				2			
3	6	1				2			
3	7	1				2			
3	8	1				2			
3	9	1				2			
4	0	1				2			
4	1	1				2			

A	B	*	C	D	E	*	F	G	H
4	2	1				2			
4	3	1				2			
4	4	1				2			
4	5	1				2			
4	6	1				2			
4	7	1				2			
4	8	1				2			
4	9	1				2			
5	0	1				2			
5	1	1				2			
5	2	1				2			
5	3	1				2			
5	4	1				2			
5	5	1				2			
5	6	1				2			
5	7	1				2			
5	8	1				2			
5	9	1				2			
6	0	1				2			
6	1	1				2			
6	2	1				2			
6	3	1				2			
6	4	1				2			
6	5	1				2			
6	6	1				2			
6	7	1				2			
6	8	1				2			
6	9	1				2			
7	0	1				2			
7	1	1				2			
7	2	1				2			
7	3	1				2			

Program 8, Night Class of Service, Confirmation Tone, Instrument Type, Do Not Disturb, Paging Groups

Initialized Values:
Night Class of Service - 0
Confirmation Tone - 0
Instrument Type - 0
Do Not Disturb - 0
Paging Groups - 1

A	B	C	D	E	F	G
1	0					
1	1					
1	2					
1	3					
1	4					
1	5					
1	6					
1	7			3		1
1	8			3		1
1	9					
2	0					
2	1					
2	2					
2	3					
2	4					
2	5					
2	6					
2	7					
2	8					
2	9					
3	0					
3	1					
3	2					
3	3					
3	4					
3	5					
3	6					
3	7					
3	8					
3	9					
4	0					
4	1					
4	2					
4	3					
4	4					
4	5					
4	6					
4	7					
4	8					
4	9					
5	0					
5	1					
5	2					
5	3					
5	4					
5	5					
5	6					
5	7					
5	8					
5	9					
6	0					
6	1					
6	2					
6	3					
6	4					
6	5					
6	6					
6	7					
6	8					
6	9					
7	0					
7	1					
7	2					
7	3					

Program 9, Executive Call Forward

*	A	B	C	D
1				
2				
3				
4				
5				
6				
7				
8				

Initialized Values:
Executive Call Forward - not programmed

Program 10, Dual Handsfree Hotline

A	B	C	D	E	F

Initialized Values:
Dual Handsfree Hotline - not programmed

Program 11, Group Hunt

A	*	B	C
0	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

Initialized Values:
Group Hunt - not programmed

A	*	B	C
1	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

A	*	B	C
2	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

A	*	B	C
3	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

A	*	B	C
4	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

A	*	B	C
5	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

A	*	B	C
6	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

A	*	B	C
7	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

A	*	B	C
8	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

A	*	B	C
9	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

Program 12, Door Chime Box

*	A	B
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Initialized Values:
Door Chime Box - no ports assigned

Program 13, DSS Conscle Port Assignment

*	A	B
1		
2		

Initialized Values:
No ports assigned

Program 14, Flexible Station Number Assignment

Initialized Values: Station numbers same as port numbers

A	B	C	D
1	0		
1	1		
1	2		
1	3		
1	4		
1	5		
1	6		
1	7		
1	8		
1	9		
2	0		
2	1		
2	2		
2	3		
2	4		
2	5		
2	6		
2	7		
2	8		
2	9		
3	0		
3	1		
3	2		
3	3		
3	4		
3	5		
3	6		
3	7		
3	8		
3	9		
4	0		
4	1		

A	B	C	D
4	2		
4	3		
4	4		
4	5		
4	6		
4	7		
4	8		
4	9		
5	0		
5	1		
5	2		
5	3		
5	4		
5	5		
5	6		
5	7		
5	8		
5	9		
6	0		
6	1		
6	2		
6	3		
6	4		
6	5		
6	6		
6	7		
6	8		
6	9		
7	0		
7	1		
7	2		
7	3		

Program 16, CO Call Waiting

Initialized Values: CO Call Waiting - all ports programmed

A	B	C
1	0	
1	1	
1	2	
1	3	
1	4	
1	5	
1	6	
1	7	
1	8	
1	9	
2	0	
2	1	
2	2	
2	3	
2	4	
2	5	
2	6	
2	7	
2	8	
2	9	
3	0	
3	1	
3	2	
3	3	
3	4	
3	5	
3	6	
3	7	
3	8	
3	9	
4	0	
4	1	

A	B	C
4	2	
4	3	
4	4	
4	5	
4	6	
4	7	
4	8	
4	9	
5	0	
5	1	
5	2	
5	3	
5	4	
5	5	
5	6	
5	7	
5	8	
5	9	
6	0	
6	1	
6	2	
6	3	
6	4	
6	5	
6	6	
6	7	
6	8	
6	9	
7	0	
7	1	
7	2	
7	3	

Program 15, Flexible Line Appearance

A
☐ ○

Initialized Values:
Flexible Line Appearance - not programmed

Program 17, Night Transfer

A
☐

Initialized Values:
Night Transfer - only system programming port can enable

Program 18, External Paging Output

A	B	C	D	E	F
1					
2					

Initialized Values:
CO Line group - none
BGM - 0
Alarm tones - 0, 0

Program 19, All External Zone Paging

A
☐

Initialized Values:
All External Zone Paging - 1

Program 20, Ringing Line Preference

A
☐

Initialized Values:
Ringing Line Preference - 2

Program 22, Exclusive Hold

A
☐

Initialized Values:
Exclusive Hold - 1

Program 23, Intercom Call Waiting

Initialized Values: Intercom Call Waiting - all ports - 1

A	B	C
1	0	
1	1	
1	2	
1	3	
1	4	
1	5	
1	6	
1	7	
1	8	
1	9	
2	0	
2	1	
2	2	
2	3	
2	4	
2	5	
2	6	
2	7	
2	8	
2	9	
3	0	
3	1	
3	2	
3	3	
3	4	
3	5	
3	6	
3	7	
3	8	
3	9	
4	0	
4	1	

A	B	C
4	2	
4	3	
4	4	
4	5	
4	6	
4	7	
4	8	
4	9	
5	0	
5	1	
5	2	
5	3	
5	4	
5	5	
5	6	
5	7	
5	8	
5	9	
6	0	
6	1	
6	2	
6	3	
6	4	
6	5	
6	6	
6	7	
6	8	
6	9	
7	0	
7	1	
7	2	
7	3	

Program 24, Voice Announce/Tone Signal Call

A

☐

Initialized Values:
Voice Announce/Tone Signal Call - 0

Program 25, Microphone On/Off

A

☐

Initialized Values:
Microphone On/Off - 0

Program 26, Background Music (BGM)

A

☐

Initialized Values:
Background Music - 0

Program 27, Room Monitor

A

☐

Initialized Values:
Room Monitor - 1

Program 28, Alarm Sensor

A B C

1 ☐ ☐
2 ☐ ☐

Initialized Values:
Alarm Sensor 1 - 0
Alarm Sensor 2 - 0

Program 30, Multi-Line Conference

A

☐

Initialized Values:
Multi-Line Conference - 1

Program 31, Three Minute Warning Tone

A

☐

Initialized Values:
Three Minute Warning Tone - 0

Program 32, Door Chime Box Signal

A

☐

Initialized Values:
Door Chime Box Signal - 0

Program 33, Single Step Access

A

☐

Initialized Values:
Single Step Access - 1

Program 35, Exclusive Hold Recall

A B C

☐☐☐

Initialized Values:
Exclusive Hold Recall - 006

Program 36, Exclusive Hold Recall Duration

A B C

Initialized Values:
Exclusive Hold Recall
Duration - 003

Program 37, System Hold Recall

A B C

Initialized Values:
System Hold Recall - 006

Program 38, Call Transfer Timer

A B C

Initialized Values:
Call Transfer Timer - 003

Program 39, DSS Transfer Timer

A B C

Initialized Values:
DSS Transfer Timer - 006

Program 40, Class of Service

Initialized Values: Class of Service - 0 for all ports

A	B	C
1	0	
1	1	
1	2	
1	3	
1	4	
1	5	
1	6	
1	7	
1	8	
1	9	
2	0	
2	1	
2	2	
2	3	
2	4	
2	5	
2	6	
2	7	
2	8	
2	9	
3	0	
3	1	
3	2	
3	3	
3	4	
3	5	
3	6	
3	7	
3	8	
3	9	
4	0	
4	1	

A	B	C
4	2	
4	3	
4	4	
4	5	
4	6	
4	7	
4	8	
4	9	
5	0	
5	1	
5	2	
5	3	
5	4	
5	5	
5	6	
5	7	
5	8	
5	9	
6	0	
6	1	
6	2	
6	3	
6	4	
6	5	
6	6	
6	7	
6	8	
6	9	
7	0	
7	1	
7	2	
7	3	

Program 41, Permitted Codes

A	B	C	D	E	F	G	H	I	J	K	L	M	N
0	1												
0	2												
0	3												
0	4												
0	5												
0	6												
0	7												
0	8												
0	9												
1	0												
1	1												
1	2												
1	3												
1	4												
1	5												
1	6												
1	7												
1	8												
1	9												
2	0												
2	1												
2	2												
2	3												
2	4												
2	5												
2	6												
2	7												
2	8												
2	9												
3	0												

Initialized Values:
Permitted codes - not programmed

Program 42, Permitted Code Digits

A	B

Initialized Values:
Permitted Code Digits - 00

Program 43, Private Branch Exchange (PBX) Access Codes

A	B	C
1		
2		
3		
4		

Initialized Values:
PBX Access Codes - all blanks

Program 44, Common Unrestricted Codes

A	B	C	D	E
1				
2				
3				
4				

Initialized Values:
Common Unrestricted Codes - all blanks

Program 45, Digit Absorbing

A	B
1	
2	
3	
4	

Initialized Values:
Digit Absorbing - all blanks

Program 46, Second Digit Restriction

A

Initialized Values:
Second Digit Restriction - 0

Program 47, Recall Line Preference

A

Initialized Values:
Recall Line Preference - 1

Program 48, Night Class of Service Selection

A

Initialized Values:
Night Class of Service Selection - 7

Program 49, Excluded System Features *

A	B
1	
2	
3	
4	
5	
7	

Initialized Values:
Excluded System Features - 0

*Group 6 is not used

Program 50, Call Duration Timer

A

Initialized Values:
Call Duration Timer - 0

Program 51, Call Duration Start Timer

A	B	C

Initialized Values:
Call Duration Start Timer - 020

Program 52, Paging Splash Tone

A

Initialized Values:
Paging Splash Tone - 1

Program 53, Alarm Signal Tone

Initialized Values: Alarm Signal Tone - 0 for all ports

A	B	C
1	0	
1	1	
1	2	
1	3	
1	4	
1	5	
1	6	
1	7	
1	8	
1	9	
2	0	
2	1	
2	2	
2	3	
2	4	
2	5	
2	6	
2	7	
2	8	
2	9	
3	0	
3	1	
3	2	
3	3	
3	4	
3	5	
3	6	
3	7	
3	8	
3	9	
4	0	
4	1	

A	B	C
4	2	
4	3	
4	4	
4	5	
4	6	
4	7	
4	8	
4	9	
5	0	
5	1	
5	2	
5	3	
5	4	
5	5	
5	6	
5	7	
5	8	
5	9	
6	0	
6	1	
6	2	
6	3	
6	4	
6	5	
6	6	
6	7	
6	8	
6	9	
7	0	
7	1	
7	2	
7	3	

Program 54, Release of Abandoned Calls On Hold

A

Initialized Values:
Release of Abandoned calls on Hold - 2

Program 55, DND Override by DSS Console

A

Initialized Values:
DND Override by DSS Console - Not programmed

Program 56, Flash Type/Timing

A	B	C	D
1			
2			

Initialized Values:
CO line - 015
PBX line - 007

Program 57, Dial-Pulse Sender Speed

A	B	C
0	1	
0	2	
0	3	
0	4	
0	5	
0	6	
0	7	
0	8	
0	9	
1	0	
1	1	
1	2	
1	3	
1	4	
1	5	
1	6	
1	7	
1	8	
1	9	
2	0	
2	1	
2	2	
2	3	
2	4	

Initialized Values:
Dial-Pulse Sender Speed - 0

Program 58, Make/Break Ratio

A

Initialized Values:
Make / Break Ratio - 1

Program 60, CO Audible Rate Assignment

Initialized Values: CO Audible Rate Assignment - 0

A	B	C
1	0	
1	1	
1	2	
1	3	
1	4	
1	5	
1	6	
1	7	
1	8	
1	9	
2	0	
2	1	
2	2	
2	3	
2	4	
2	5	
2	6	
2	7	
2	8	
2	9	
3	0	
3	1	
3	2	
3	3	
3	4	
3	5	
3	6	
3	7	
3	8	
3	9	
4	0	
4	1	

A	B	C
4	2	
4	3	
4	4	
4	5	
4	6	
4	7	
4	8	
4	9	
5	0	
5	1	
5	2	
5	3	
5	4	
5	5	
5	6	
5	7	
5	8	
5	9	
6	0	
6	1	
6	2	
6	3	
6	4	
6	5	
6	6	
6	7	
6	8	
6	9	
7	0	
7	1	
7	2	
7	3	

Program 61, CO Audible Rate Assignment Timer

A	B	C

Initialized Values:
CO Audible Rate Assignment Timer - 000

BUSINESSCOM PLUS 24/36/64
ELECTRONIC KEY TELEPHONE SYSTEMS
APPENDIX B
OPERATIONAL SPECIFICATIONS

AUTOMATIC INTERCOM ANSWER (Permanent)

This feature permits the single-step answer of an Intercom call.

To initiate Automatic Intercom Answer:

- *(Incoming Intercom call.)*
- *Lift handset or press SPK key.*

BACKGROUND MUSIC (BGM)
(Optional/Programmable)

This feature permits idle stations and external zones to receive an external music source. Background Music is disabled at a given station when Room Monitor is in use at that station.

To initiate BGM:

- *Press #. BGM heard at speaker.*

To cancel BGM:

- *Press #.*

CALL FORWARD WITH FOLLOW-ME (Permanent)

This feature permits the automatic transfer (Call Forward) of an Intercom call to a second station. The destination of the forwarded call can be changed to yet a third station and so on (Follow-Me).

To initiate Call Forward:

- *Press RG.TR key.*
- *Dial originating station number.*
- *Dial destination station number.*
- *Press RG.TR key. RG.TR LED flashes intermitten Single splash tone is heard at originating station. RG. key flashes at destination station.*

To initiate or change Follow-Me:

- *Press RG.TR key.*
- *Dial originating station number.*
- *Dial new destination station number.*
- *Press RG.TR key. RG.TR key LED extinguishes at destination station and flashes at new destinat station.*

NOTE: Calls cannot be forwarded to a station that h invoked Do Not Disturb.

To cancel Call Forward:

- *Press RG.TR key.*
- *Dial originating station number.*
- *Press RG.TR key. RG.TR LEDs at both static extinguish.*

NOTE: The originating station OR the destination stati can change the destination of the Follow-Me. Cancelation Call Forward is possible by the originating station only.

CALL MONITOR (Permanent)

This feature permits on-hook dialing of an Intercom or CO line telephone number.

To initiate Call Monitor:

- *Press the SPK key. LED lights. (If Single Step Access is programmed, the user need only press an idle Line key.)*
- *Press idle CO Line key. LED illuminates. Dial tone audible.*
- *Establish CO call.*
- *Lift handset. (Stations with speakerphones need not lift the handset to establish two-way conversation.)*
- *Conversation possible.*

CALL PICKUP (Permanent)

This feature permits any station to intercept an Intercom call intended for another station.

To initiate Call Pickup:

- *(Intercom call to another station).*
- *Lift handset.*
- *Dial # if in same Paging group or dial the called station number. (If there is more than one incoming Intercom call, the use of # selects the first incoming call.)*

CALL TRANSFER ANNOUNCED (Voice Announce/Tone Signal Call and Timer — Programmable)

This feature permits the voice announced transfer of an established CO call to a second station. Voice Announce must be programmed. If the call is not answered within a programmed period of time, it reverts back to the transferring station.

To initiate Call Transfer Announced (without DSS Console):

- *Establish CO call.*
- *Press ICM key and dial station number. Announcement possible.*
- *Called party must lift handset or press SPK key to seize transferred call.*
- *Transferring station hangs up.*

To initiate Call Transfer Announced (with DSS Console):

- *Establish CO call.*
- *Press DSS Console key. CO call put on Hold. Announcement possible.*
- *Called party must lift handset or press SPK key to seize transferred call.*
- *Transferring station depresses RG INW key of DSS Console and hangs up.*

CALL TRANSFER UNANNOUNCED (Voice Announce/Tone Signal Call and Timer — Programmable)

This feature permits the transfer of an established CO call, with ringing, to a second station. Tone Signal Call must be programmed. If the station is busy, the Call Transfer Unannounced does not proceed. If the transferred call is not answered within a programmed period of time, the call reverts back to the transferring station and re-rings briefly.

To initiate Call Transfer Unannounced (without DSS Console):

- *Establish CO call.*
- *Press ICM key. CO Line key LED flashes.*
- *Dial desired station number.*
- *Press RG INW key. CO Line key LED lights steadily.*
- *Hang up. Called station receives tone and CO Line key flashes.*

To initiate Call Transfer Unannounced (with DSS Console):

- *Establish CO call.*
- *Press DSS key.*
- *Press RG INW key on console.*
- *Hang up.*

CALL WAITING (Programmable)

This feature permits incoming CO and Intercom calls to ring through to a station that is busy on another call.

Two types of Call Waiting are available:

(a) CO Call Waiting — if a user has seized a CO line, an incoming call on another CO line is still permitted to ring through.

(b) Intercom Call Waiting — if a user has seized an Intercom line, another incoming Intercom call is still allowed to ring through.

To initiate Intercom Call Waiting (without DSS Console):

- *Call station (station busy).* †
- *Dial 1. Called station receives signal tone.*

To initiate Intercom Call Waiting (with DSS Console):

- *Call station (busy).*
- *Press SG/VC key. Called station receives signal tone.*

† If Intercom Call Waiting is programmed for the Automatic mode, the called station receives a signal tone without dialing 1.

NOTE: If the called station user presses the Check key (on Display telephones), the number of the calling station is displayed. Press CLOCK key to return time/date display.

CALLBACK (Permanent)

This feature permits a user to receive a signal tone when a previously called busy station becomes idle. If the caller then seizes the Intercom link, the idle station is called. The user at the calling station must seize the Intercom link within 20 seconds or the Callback is canceled. Camp-On requests take priority over Callback requests. Callback is nonfunctional when Call Waiting is programmed for the Automatic mode.

To initiate Callback:

- *Use the telephone to dial station number (busy).*
- *Press *. Splash tone heard at initiating station through speaker.*
- *Hang up. Signal tone heard when station becomes idle.*
- *Lift handset. Idle station issued signal tone.*

To cancel Callback:

- *Lift handset or press SPK key.*
- *Press *.*
- *Press 1.*
- *Hang up or press SPK key.*

CAMP-ON (Permanent)

This feature permits the caller to a busy station to wait off-hook until the busy station resumes an idle condition. The station is automatically called when the idle condition is resumed. Camp-On requests take priority over Callback requests. Camp-On cannot be used if the Automatic mode of Call Waiting (Intercom) is programmed.

To initiate Camp-On:

- *Use the telephone to call a station (busy).*
- *Press 2. The busy signal stops.*
- *Do not hang up.*
- *Called station is automatically dialed when it resumes an idle condition. You hear ringing.*

CLOCK FEATURES

These features permit an Executive Display telephone user display access to the Alarm feature, Stopwatch and Call Duration Timer. The latter feature times the length of a CO call. All programming must be done at Port 10 (except for Alarm Settings).

(a) Alarm Setting (Programmable)
- *Lift handset or press SPK key.*
- *Press ALARM key.*
- *Dial 1 or 2. Two Alarm settings are available.*
- *Dial time in terms of 24 hour clock (e.g., 15:45 for 3:45 PM).*
- *Press* *.
- *Hang up or press SPK key.*

Alarm Stop
- *Press ALARM key.*

Alarm Display
- *Lift handset or press SPK key.*
- *Press ALARM key.*
- *Dial 1 or 2. Alarm displayed.*
- *Hang up or press SPK key.*

Alarm Clear
- *Lift handset or press SPK key.*
- *Press ALARM key.*
- *Dial 1 or 2.*
- *Press* *.
- *Hang up or press SPK key.*

(b) Call Duration Timer (Programmable)
- *Lift handset or press SPK key.*
- *Establish CO line call. Timer starts after programmed delay.*
- *Hang up or press SPK key. Timer stops.*
- *Press CLOCK key to clear display. Date/time displayed.*

NOTE: The Timer can be manually started by pressing the Timer key.

(c) Stopwatch (Permanent)
- *Press TIMER key. Timer starts.*
- *Press TIMER key. Timer stops.*
- *Press CLOCK key. Timer display cleared and date/time displayed.*

(d) Date/Time Setting (Programmable)
- *Lift handset or press SPK key.*
- *Press OPAC key.*
- *Press CLOCK key.*
- *Enter year (e.g., 1985).*
- *Press* *.
- *Enter month and date (e.g., 0120 for January 20).*
- *Press* *.
- *Enter number for day of week:*
  0—Sunday
  1—Monday
  2—Tuesday
  3—Wednesday
  4—Thursday
  5—Friday
  6—Saturday
- *Press* *.
- *Enter time in terms of 24 hour clock (e.g., 1305 for 1:05 PM).*
- *Press* *.
- *Hang up or press SPK key.*

CO LINE GROUPS (Programmable)

This feature permits the formation of 30 line groups. A line is permitted assignment to more than one group. Line groups provide a means of inward and outward access.

Incoming and/or outgoing access is programmable on a per station basis. Incoming audible, either day, night or day/night, is also programmable on a per station basis. Stations having access to incoming line groups and day audible receive ringing when Night Transfer is deactivated. Those having access to incoming line groups and night audible receive ringing when Night Transfer is activated. Two groups can be assignable to each station for incoming access and two groups for outgoing access.

COMMON USE LINE (Programmable)

This feature permits the addition of a line group for outgoing and incoming calls. Access is permitted to any station in the system regardless of that station's Class of Service.

COMPONENT COMMONALITY (Permanent)

This feature permits the integration of different system components allowing the formation of a single system. For example, Businesscom Plus 3 Line telephones can be used in a Businesscom Plus 5 Line configuration. A Businesscom Plus 8, 12 or 24 Line telephone can be used in a Businesscom Plus 8/12.

CONFERENCE

This feature permits internal and external parties to Conference. The system provides four types of Conference.

Add-On Conference (Permanent)

This feature permits six internal parties to Conference with each other.

To initiate Add-On Conference (internal parties only):

- *Establish first Intercom call using the telephone.*
- *Press CONF key once.*

To include more stations:

- *Establish Intercom call.*
- *Press CONF twice.*

Meet-Me Conference (Programmable)

This feature permits five internal parties to Conference with a Paging party after All Call or Internal Zone Paging has been initiated. Stations must join the Conference within 30 seconds.

To initiate Meet-Me Conference:

- *Initiate page using the telephone. (If all conferencing stations are not in the same Paging zone, All Call Paging must be used.)*
- *Press CONF key.*
- *Paged stations go off-hook and press CONF key. Meet-Me Conference is established.*

Multi-Line Conference (Programmable)

This feature permits two external parties to Conference w a maximum of six internal parties.

To initiate Multi-Line Conference:

- *Establish CO call.*
- *Press OPAC key.*
- *Press CONF key. CO Line key LED flashes intern tently.*
- *Establish second CO call.*
- *Press CONF key. Three-party Conference establish*

To add internal parties:

- *Press CONF key.*
- *Establish call with internal party.*
- *Press CONF key.*

Unsupervised Conference (Programmable)

This feature permits an internal party to establish Conference between two external parties. The Conference maintained after the initiator hangs up. The initiating stati can reenter the Conference. Both Multi-Line Conference a Release of Abandoned Calls on Hold must be programm in order for this feature to work.

To initiate Unsupervised Conference:

- *Establish CO call.*
- *Press OPAC key.*
- *Press CONF key. Line key flashes intermittently. MO if programmed, is heard at held station.*
- *Establish second CO call.*
- *Press CONF key. (Three-way Conference enabled.)*
- *Press OPAC key.*
- *Press CONF key.*
- *Hang up. Unsupervised Conference established.*

To reenter the Unsupervised Conference:

- *Lift handset or press SPK key.*
- *Press either Line key.*

To leave the Conference again:

- *Press OPAC key.*
- *Press CONF key.*
- *Hang up.*

CONFIRMATION TONE (Programmable)

This feature permits the initiation of a tone when a recognized telephone key depression occurs as a result of some user action.

To initiate Confirmation Tone:

- *Press* ✱.
- *Confirmation Tone is enabled.*

To cancel Confirmation Tone:

- *Press* ✱.

DIAL PULSE (DP) TO TONE (DTMF) CONVERSION (Permanent)

This feature permits outward dialing on a line programmed for Dial Pulse (DP) signaling using both Dial Pulse and Tone (DTMF) signaling.

To initiate DP to DTMF conversion:

- *Send Dial Pulse signals.*
- *Press #.*
- *Dial numbers. DTMF signals are sent.*

DIRECT INWARD SYSTEM ACCESS (DISA) (Programmable)

This feature permits external parties to call into the key system and access key system features, e.g., dial access to stations.

DIRECT STATION SELECTION (DSS) (Permanent)

This feature permits one button calling to parties in the system. Each telephone has 10 DSS keys. Each key can serve as a storage bin for a station number. When an Intercom link is seized and a function key is pressed, the stored number is dialed.

To store station numbers:

- *Lift handset or press SPK key.*
- *Press DC key.*
- *Dial #.*
- *Press function key.*
- *Dial station number.*
- *To store another station number, do not hang up. Repeat all above steps except first.*
- *Hang up or press SPK key when finished.*

To initiate DSS Intercom Call:

- *Lift handset or press SPK key.*
- *Press function key.*

DIRECT STATION SELECTION (DSS) CONSOLE (Optional/Programmable)

This feature permits console access to the following features:

(a) Call Transfer Announced
(b) Call Transfer Unannounced
(c) DND Override by DSS Console
(d) Door Chime Box
(e) Hold (System)
(f) External Alarm Signals to Stations (LED)
(g) Message Waiting
(h) Night Transfer
(i) Paging, All Call
(j) Paging, All External Zone
(k) Paging, External Zone
(l) Paging, Internal Zone

Console access to these features is discussed under each individual feature item.

DISPLAY TELEPHONE FEATURES (Permanent)

These features permit various feature checks at Display telephones:

(a) System Speed Dial Number Check
- *Press CHECK key.*
- *Press DC key.*
- *Dial System Speed Dial number. System Speed Dial number displayed.*

NOTE: If the number is greater than 12 digits, press * to display the remaining numbers.

(b) DSS Station Number Check
- *Press CHECK key.*
- *Press ICM key.*
- *Press function key. Station number displayed.*
- *Press CLOCK key. Display cleared.*

(c) Intercom Call Station Number Check
- *(Before answering an incoming ICM call.)*
- *Press CHECK key. Calling station number displayed.*

(d) Message Waiting Originator Station Check
- *Press CHECK key.*
- *Press *. Station number displayed.*

(e) Station Speed Dial Number Check
- *Press CHECK key.*
- *Press DC key.*
- *Press function key. Station Speed Dial number displayed.*
- *Press CLOCK key. Display cleared.*

DO NOT DISTURB (DND) (Programmable)

This feature permits incoming CO and/or Intercom audible to be blocked at a given station when activated at that station. Three levels of DND are programmable:

(a) Incoming CO audible is blocked with one key depression. LED flashes (level 1).

(b) Incoming CO/ICM audible are blocked with one key depression. LED lights steadily (level 2).

(c) 1. Incoming CO/ICM audible are blocked with one key depression. LED lights steadily (level 3).
2. Incoming CO audible is blocked with a second key depression. LED flashes (level 3).

To initiate DND: (level 1)
- *Press DND key once. LED flashes. Incoming CO audible blocked.*

To cancel DND: (level 1)
- *Press DND key once. LED extinguishes. Normal mode resumed.*

To initiate DND: (level 2)
- *Press DND key once. LED lights steadily. Incoming ICM/CO audible blocked.*

To cancel DND: (level 2)
- *Press DND key once. LED extinguishes. Normal mode resumed.*

To initiate DND: (level 3)
- *Press DND key once. DND LED lights steadily. ICM/CO incoming audible blocked.*
- *Press DND key again. DND LED flashes. CO audible blocked.*

To cancel DND: (level 3)
- *Press DND key until DND LED extinguishes. Normal mode resumed.*

If a station is receiving transferred ringing from another station, that station cannot invoke DND. Likewise, ringing cannot be transferred to a station where DND has been invoked.

DO NOT DISTURB OVERRIDE BY DSS CONSOLE (Programmable)

This feature permits the override of a DND condition at a station by a DSS Console. DSS Console override is unavailable at an Executive station of an Executive Call Forward pair when Executive Call Forward is activated.

To initiate DND Override by DSS Console:
- *Lift handset or press SPK key.*
- *Press DSS key of appropriate station in DND condition. DND overridden.*

DOOR CHIME BOX (Optional/Programmable)

This feature permits internal parties access to Door Chime Box functions. A Door Chime Box acts as a doorbell and intercom. Ten stations, if programmed, receive chime tones when the Door Chime Box button is pushed. If the chime box is answered, a two-way conversation is made possible. Two Door Chime Boxes are permitted. The number of chime tones is programmable. Door Chime Box 1, (88) issues a single tone when the Door Chime Box button is pressed. Door Chime Box 2, (89) issues a double chime tone when the Door Chime Box button is pressed.

To initiate a chime tone and conversation:

- *Press the chime tone button on the Door Chime Box. Programmed stations receive chime tones.*
- *Station user lifts handset. Chime tones cease. Conversation possible.*

To initiate a call to the Door Chime Box (without DSS Console):

- *Lift handset.*
- *Press ICM key.*
- *Dial 88 for Door Chime Box 1 or 89 for Door Chime Box 2. Conversation possible.*

To initiate a call to the Door Chime Box (with DSS Console):

- *Lift handset.*
- *Press DOOR key on console. ICM key lights. Conversation possible.*

DUAL COLOR LED (Permanent)

This feature permits two-color LED CO Line keys with the following characteristics:

(a) When a CO line is seized, the green LED at the initiating station illuminates. The red LEDs at all other stations illuminate.
(b) When a CO call is placed on either System Hold or Exclusive Hold, the green LED at the Hold initiating station flashes. The red LEDs at all other stations illuminate.
(c) When a CO call is transferred to another station, the green LED at that station illuminates. Red LEDs at all other stations illuminate.

Only Executive Display telephones have Dual Color LED function.

DUAL HANDSFREE HOTLINE (Programmable)

This feature permits a Secretary station to call two Manager stations simultaneously provided that both Manager stations are idle. Four Manager/Secretary pairs are permitted. Dual Handsfree Hotline is available only if both Manager stations are idle.

To initiate Dual Handsfree Hotline:

- *Seize Intercom line at Secretary station.*
- *Dial either Manager station number. Both stations are called. Handsfree Reply on Intercom available at both Manager Stations.*

NOTE: When one station answers by lifting the handset or pressing the SPK key, the other station call is terminated.

EXCLUDED SYSTEM FEATURES (Programmable)

This program permits certain features that are enabled upon initialization to be disabled. These are, by group:

(1) Meet-Me Paging, Meet-Me Conference, Call Pickup.
(2) Call Forward with Follow-Me, Night Transfer.
(3) Call Transfer Unannounced, Announced Call Transfer.
(4) Add-On Conference.
(5) Step Call, Camp-On, Message Waiting.
(6) Not Used.
(7) Class of Service Restriction Override for System Speed Dial numbers.

EXECUTIVE CALL FORWARD (Programmable)

This feature permits the transfer of incoming Intercom and CO calls, with ringing, from a station designated the Executive, to a second, designated the Secretary. Eight Executive/Secretary pairs are allowed. All Executive stations are permitted assignment to the same Secretary station. The Executive station must be programmed for DND (level 2) in order for this feature to operate properly. The Secretary station should not be programmed for DND.

To initiate Executive Call Forward:

- *Press DND key. LED lights steadily at Executive station and flashes at Secretary station. Incoming CO and Intercom calls transferred.*

To cancel Executive Call Forward:

- *Press DND key. LED extinguishes.*

EXECUTIVE OVERRIDE [Barge In] (Programmable)

This feature permits any station so programmed to enter a CO line conversation uninvited and with no warning.

To initiate Executive Override:

- *Lift handset or press SPK key.*
- *Press CO Line key in use.*

EXTERNAL ALARM SIGNALS TO STATIONS (Programmable)

This feature permits two inputs for connection with an external alarm system. Both station speakers and external zones can receive alarm tones. DSS Consoles have ALARM LEDs that indicate Alarm status.

FLASH (Permanent)

This feature permits a station user to acquire another dial tone without losing the line in use. It also permits access of PBX features including transfer.

To initiate Flash:

- *While using a line, press FLSH key. New dial tone available.*

FLEXIBLE LINE APPEARANCE (Programmable)

This feature permits CO line calls to appear on differe numbered Line keys. For example, a Businesscom Plus has 5 CO lines but a Businesscom Plus 3 Line telephone h only 3 CO Line keys. Programming allows the extra CO lin i.e., lines 4 and 5, to appear at different numbered keys a 3 Line telephone. Line 4 can be programmed to appear Line key 1, for instance.

FLEXIBLE STATION NUMBER ASSIGNMENT (Programmable)

This feature permits the reassignment of station numbe e.g., station 10 reassigned as station 12. Each number mu however, be dedicated to only one station. For instance, t stations cannot share the same number; there cannot be t station 12s.

GROUP HUNT (Programmable)

This feature permits stations to be grouped under a hu group number. When this number is dialed, an idle stati in the group is sought out sequentially. The hunt gro numbers are:

Hunt Group Numbers
0 to 9

To initiate Group Hunt:

- *Lift handset or press SPK key.*
- *Press ICM key.*
- *Press #.*
- *Dial Hunting Group Number. Idle station contacted.*

NOTE: If two Manager stations in a hunt group are pair to a Secretary station via Dual Handsfree Hotline, and Gro Hunt is initiated from the Secretary station, both Manag stations are called simultaneously.

GROUP HUNT TRANSFER (Programmable)

This feature permits the transfer of an established CO call with or without ringing (announced or unannounced) to an idle station in a hunt group. Hunt groups have designated group numbers. When a group number is dialed, an idle station within the group is sought out. The search is sequential starting from the first station entered into programming. If all stations are busy, the Unannounced Transfer does not proceed. If the transferred call is not answered within a programmed period of time, the call reverts back to the transferring party.

To initiate Group Hunt Transfer (announced):

- *Establish CO call.*
- *Press ICM key.*
- *Press #.*
- *Dial hunting group number. Idle station contacted.*
- *Announce call.*
- *Hang up.*

To initiate Group Hunt Transfer (unannounced):

- *Establish CO call.*
- *Press ICM key.*
- *Press # .*
- *Dial hunting group number. Idle station contacted.*
- *Press RG INW key. Ringing at called station.*
- *Hang up.*

HANDSFREE REPLY ON INTERCOM (Permanent)

This feature permits stations to engage in internal handsfree conversations.

To initiate Handsfree Reply on Intercom:

- *(Be sure microphone is enabled. MIC LED extinguished.)*
- *On incoming Intercom call, just talk.*

HOLD

This feature permits two types of Hold:
Calls on Exclusive Hold are retrievable at the Hold initiating station only. If an exclusively held call is not answered within a programmed period of time, a reminder signal is issued to the Hold initiating station. If the call remains unanswered for the duration of the recall period, Exclusive Hold is automatically canceled and the call is placed on System Hold.

System Hold can be initiated at any station. CO calls on System Hold are retrievable at any station. If a call on System Hold is not answered within a programmed period of time, a recall signal is issued to the initiating station. The recall can be disabled through programming.

Exclusive Hold (Programmable)

To initiate Exclusive Hold:

- *Establish CO call.*
- *Press HOLD key twice. MOH, if available, is heard by the external party. CO Line key flashes intermittently at initiating station and is steady at other stations.*

To retrieve a call on Exclusive Hold:

- *Lift handset or press SPK key.*
- *Press flashing Line key.*

System Hold (Permanent)

To initiate System Hold (without DSS):

- *Establish CO call.*
- *Press HOLD key. CO Line key LED flashes quickly at initiating station and slowly at other stations. MOH, if available, is heard by the external party.*

To retrieve a call on System Hold (without DSS):

- *Lift handset or press SPK key.*
- *Press flashing CO Line key.*

To initiate System Hold (with DSS):

- *Establish CO call.*
- *Press DSS, Paging or Door key. CO Line key flashes.*

To cancel System Hold (with DSS):

- *Lift handset or press SPK key.*
- *Press flashing CO Line key.*

INTERCOM (Voice Announce/Tone Signal—Programmable)

This feature permits either voice announced or tone signaled call for internal calls.

To initiate an Intercom call (Tone Signal):

- *Lift handset or press SPK key.*
- *Press ICM key.*
- *Dial extension number. Tone signal issued to called station.*

OR

- *Lift handset or press SPK key.*
- *Press ICM key.*
- *Dial extension number followed by 1. Voice announced call enabled at called station.*

To initiate an Intercom call (Voice Announce):

- *Lift handset or press SPK key.*
- *Press ICM key.*
- *Dial extension number. Splash tone issued to called station. Voice announced call enabled at station.*

OR

- *Lift handset or press SPK key.*
- *Press ICM key.*
- *Dial extension number followed by 1. Tone signal issued to called station.*

LAST NUMBER DIAL (Permanent)

This feature permits the storage of the last telephone number dialed under station DSS key 10 and erases any previously stored data. The last number dialed can be redialed by a two-or-three-step operation. The last DSS key on telephones is reserved as a Last Number Dial key by Program 91. If a Save or Speed Dial number is stored under the last DSS key, Last Number Dial capability is lost (using the DSS key) unless the bin is cleared. Last Number Dial is erased when Line Queueing is used.

To initiate Last Number Dial:

- *Seize idle CO line.*
- *Press DC key.*
- *Press *. Dial tone dropped. Last dialed number is redialed.*

OR

- *Seize idle CO line.*
- *Press last DSS key. Number dialed.*

Only Last Number Dial numbers are erased. If a Save or Speed Dial number is stored under key 10, it must be erased by a separate procedure as follows (this reinitializes the DSS key as a Last Number Dial bin):

- *Lift handset or press SPK key.*
- *Press DC key.*
- *Press *.*
- *Press DSS key 10.*
- *Press OPAC.*
- *Press *.*
- *Hang up.*

LINE QUEUEING (Queue Groups—Programmable)

This feature permits a station to wait in line in a group for an available CO line. When a line becomes available, the CO Line key LED flashes and initiates a recall tone to the queueing station. If the line is not seized within 20 seconds, the queue is dropped. Use of this feature erases Last Number Dial.

To queue for a CO line:

- *(CO line not available.)*
- *Lift handset or press SPK key.*
- *Press HOLD key. Dial tone audible.*
- *Dial CO line group number (1-4). HOLD LED flashes intermittently.*
- *Hang up or press SPK key.*
- *(Line becomes available.)*
- *Recall tone initiated and CO Line key and HOLD LEDs flash intermittently.*
- *Seize line. Telephones having speakerphones can seize the line by pressing the SPK key. Dial tone audible.*

NOTE: If more than eight stations are attempting to queue for a CO line, a reorder signal is initiated. If a user attempts to queue for a CO line which is not included in a queue group, a reorder signal is initiated.

MESSAGE WAITING (Permanent)

This feature permits a station or DSS Console to leave a Message Waiting indication (flashing MW lamp) at another station. The Message Waiting indication can be left at a busy station as well as an unanswered one. A Message Waiting can be left at several stations by a single station but if the initiator cancels the Message Waiting, all are canceled simultaneously.

To initiate Message Waiting (without DSS Console):

- *Dial Intercom number (busy or unanswered).*
- *Press 0. MW LED flashes intermittently.*
- *MW LED flashes at called station.*
- *Hang up.*
- *Called station user lifts handset or presses SPK key and presses ICM key followed by *. Originating station is called.*
- *MW LED extinguishes when originating station answers.*

To cancel Message Waiting (without DSS Console):

- *Lift handset or press SPK key.*
- *Press *.*
- *Press 0.*
- *Hang up or press SPK key. MW lamp extinguishes.*

To initiate Message Waiting (with DSS Console):

- *Lift handset or press SPK key.*
- *Press DSS key.*
- *Press MW key.*
- *Hang up.*

To cancel Message Waiting (with DSS Console):

- *Press MW key.*
- *Press DSS key.*

To reverse or cancel Message Waiting at destination station:

- *Lift handset or press SPK key.*
- *Press ICM key.*
- *Press *. (Busy signal or no answer at Message Waiting initiating station.)*
- *Press 0. (Reverses Message Waiting LED indications.)*
- (To cancel Message Waiting):
- *Press *.*
- *Press 0. Message Waiting canceled.*

MICROPHONE ON/OFF (Permanent)

This feature permits the programmer to change the normally on condition of the microphones, available upon initialization, to a normally off condition. The MIC key on the telephone is used to enable or disable the microphone. When the microphone is enabled, the MIC key's LED is extinguished.

To enable Microphone:

- *Press MIC key. LED extinguishes. Microphone enabled.*

To disable Microphone:

- *Press MIC key. LED illuminates. Microphone disabled.*

MUSIC ON HOLD (MOH) (Programmable)

This feature permits calls on Hold to hear music. The available selections are:

(1) "Greensleeves"
(2) "Home on the Range"
(3) External source — (not user programmable)

The music is selected by programming.

To change MOH:

- *At system programming station, lift handset or press SPK key.*
- *Press OPAC key.*
- *Press HOLD key.*
- *Dial 1 for "Greensleeves" or 2 for "Home on the Range."*
- *Hang up or press SPK key.*

NIGHT CLASS OF SERVICE (Programmable)

This feature permits stations programmed for Night Class of Service to assume a different Class of Service when Night Transfer is activated. This Class of Service overrides the normal Class of Service. This feature can be used to prohibit or limit a station's outward access.

NIGHT TRANSFER (Programmable)

This feature permits incoming CO audible at stations programmed for night audible when Night Transfer is activated. Night Class of Service is activated, for programmed stations, when Night Transfer is activated. Each station receives incoming audible only if programmed for night audible.

Programming allows two options of initiation:

(a) Only the system programming station can activate or deactivate Night Transfer.

(b) Any station can initiate Night Transfer for its particular CO audible group except for the system programming station which initiates for the whole system.

To initiate Night Transfer (without DSS Console):

- *Lift handset or press SPK key.*
- *Press RG TR.*
- *Press #. RG TR LED lights.*
- *Hang up or press SPK key.*

To cancel Night Transfer (without DSS Console):

- *Lift handset or press SPK key.*
- *Press RG TR twice. RG TR LED extinguishes.*
- *Hang up or press SPK key.*

To initiate Night Transfer (with DSS Console):

- *Press NT key on console. NT key LED illuminates.*

To cancel Night Transfer (with DSS Console):

- *Press NT key. NT key LED extinguishes.*

PAGING, ALL CALL (Paging Groups—Programmable)

This feature permits external zones and station speakers to receive All Call Paging.

To initiate All Call Paging (without DSS Console):

- *Lift handset or press SPK key.*
- *Press ICM key.*
- *Dial 80. Double splash tone heard if programmed.*
- *Paging available.*

To initiate All Call Paging (with DSS Console):

- *Lift handset or press SPK key.*
- *Press AC key on console. Double splash tone heard.*
- *Paging now available.*

PAGING, ALL EXTERNAL ZONE (Optional/Programmable)

This feature permits the external zones to receive All Call Paging.

To initiate All External Zone Paging (without DSS Console):

- *Lift handset or press SPK key.*
- *Dial 85. Double splash tone heard if programmed.*
- *Paging available.*

To initiate All External Zone Paging (with DSS Console):

- *Lift handset or press SPK key.*
- *Press EAZ key on console. Double splash tone heard if programmed.*
- *Paging available.*

PAGING, EXTERNAL ZONE (Optional/Permanent)

This feature permits the external zones to receive Paging announcements.

To initiate External Zone Paging (without DSS Console):

- *Seize Intercom line.*
- *Dial 86 for Zone 1 or 87 for Zone 2. Double splash tone is heard if programmed.*

To initiate External Zone Paging (with DSS Console):

- *Lift handset or press SPK key.*
- *Press EZ1 for Zone 1 or EZ2 for Zone 2 key on console. Double splash tone heard if programmed.*

PAGING, INTERNAL ZONE (Paging Groups — Programmable)

This feature permits stations programmed access to a Paging group to receive Internal Zone Paging.

To initiate Internal Zone Paging (without DSS Console):

- *Lift handset or press SPK key.*
- *Press ICM key.*
- *Dial zone number.*

Zone	Number
1	81
2	82
3	83
4	84

- *Paging available.*

To initiate Internal Zone Paging (with DSS Console):

- *Lift handset or press SPK key.*
- *Press IZ 1, 2, 3, 4 for Zones 1, 2, 3, 4, respectively. Double splash tone heard if programmed.*

PAGING, MEET-ME (Programmable)

This feature permits a party to engage in a private conversation with a Paging party. All Call or Internal Zone Paging can be used. The paged party must reply from a station programmed access to a Paging group. If Internal Zone Paging is used, the paged party must reply using a station programmed access to the particular group paged.

To initiate Meet-Me Paging:

- *Initiate an All Call or Internal Zone Paging using the telephone.*
- *Press #.*

To respond from a station:

- *Lift handset.*
- *Press #.*
- *Conversation possible.*

PRESELECTION (Permanent)

This feature permits a user to preselect a CO line. To preselect a line, press the desired Line key, lift the handset or press the SPK key within three seconds. A line cannot be preselected if a station is programmed for single button access.

PRIVATE LINE (Programmable)

This feature permits the dedication of a CO line to a specific station or stations for exclusive use by that station or stations.†

† Executive Override permits a second station to enter a Private Line conversation uninvited.

RECALL LINE PREFERENCE (Programmable)

This feature permits single-step seizure of a recall.

To initiate Recall Line Preference:

- *Lift handset or press SPK key.*

RELEASE OF ABANDONED CALLS ON HOLD (Programmable)

This feature permits the release of a CO line in a Hold status that has an abandoned call.

RING TRANSFER (Permanent)

This feature permits the transfer of incoming CO calls with ringing from one station, which has incoming access and audible, to a second station (destination station).

To initiate Ring Transfer:

- *Lift handset or press SPK key.*
- *Press RG TR key.*
- *Dial the extension of the destination station.*
- *Press ✻. Splash tone heard at originating station. RG TR LED flashes slowly at originating station and fast at transferred station.*
- *Hang up or press SPK key.*

To cancel Ring Transfer:

- *Lift handset or press SPK key.*
- *Press RG TR key twice. RG TR LED extinguishes.*
- *Hang up or press SPK key.*

RINGING LINE PREFERENCE (Programmable)

This feature permits single-step seizure of an incoming CO call. Selective use of this feature allows only those stations with either incoming access and audible or just incoming access to utilize Ringing Line Preference.

To initiate Ringing Line Preference:

- *(Incoming call or recalled idle line.)*
- *Lift handset or press SPK key. CO call is seized.*

ROOM MONITOR (Programmable)

This feature permits stations to monitor the environmental sounds of other stations. Room Monitor is unavailable to monitoring stations if the monitored station:

(a) Seizes a CO line or Intercom link.
(b) Lifts the handset or presses the SPK key (LED illuminates).

The monitor condition returns when the above, (a) and/or (b), are canceled. Room Monitor is unavailable to a monitoring station if it performs either of the above (a) and/or (b). The monitor condition returns following their cancelation.

To initiate Room Monitor (monitored station):

- *Lift handset or press SPK key at monitored station.*
- *Press OPAC key.*
- *Press FLSH key. MON lamp flashes.*
- *Hang up or press SPK key.*

To initiate Room Monitor (monitoring station):

- *Press OPAC key at monitoring station.*
- *Press FLSH key. MON lamp flashes intermittently.*

To cancel Room Monitor (monitored station):

- *Lift handset or press SPK key.*
- *Press OPAC key.*
- *Press FLSH key. MON lamp extinguishes.*
- *Hang up or press SPK key.*

To cancel Room Monitor (monitoring station):

- *Press OPAC key.*
- *Press FLSH key. MON lamp extinguishes.*

SAVE (Permanent)

This feature permits the storage of a telephone number in system memory. The number is retrievable for later use at the station that stored it. The stored number remains in memory until replaced by a new one. DSS key 9 is reserved by Program 91 as a Save storage bin. If another key is used, the Save is stored under the selected key and key 9.

To store Save:

- *Seize CO line.*
- *Dial number to be stored.*
- *Press OPAC key.*
- *Press DC key.*
- *Hang up. Number is stored.*

If a number other than a Save, e.g., Speed Dial number is stored under a Save, the Save does not operate unless the Save function is restored by the following procedure:

- *Lift handset or press SPK key.*
- *Press DC key. Dial tone audible.*
- *Press ✻. Dial tone ceases.*
- *Press DSS key.*
- *Press OPAC key.*
- *Press #.*
- *Hang up.*

To initiate Save:

- *Seize idle CO line.*
- *Press appropriate DSS key. Number dialed.*

SINGLE STEP ACCESS (Programmable)

This feature permits the seizure of an idle CO/Intercom line while the handset is on-hook.

To initiate Single Step Access:

- *Press idle Line key. CO line seized.*

SPEED DIAL (Permanent)

This feature permits two types of Speed Dial:

(a) System Speed Dial
(b) Station Speed Dial

System Speed Dial numbers are stored under a two-digit code by the system programming station and can be retrieved for use by any station in the system. Station Speed Dial numbers can be stored by any station and retrieved for use only by the station(s) that store them. Numbers can be chained—this is useful if a number exceeds the maximum allowed length. A Flash, stop, pause or DP to Tone (DTMF) Conversion can be stored as part of a Speed Dial number, but each reduces the maximum number of digits allowed by one. DSS keys 9 and 10 are reserved as Save and Last Number Dial, respectively, by Program 91. Speed Dial Numbers can be checked on Display telephones.

System Speed Dial

To store a System Speed Dial number:

- *(At system programming station) lift handset or press SPK key.*
- *Press DC key. Dial tone audible.*
- *Press ✻. Dial tone ceases.*
- *Enter two-digit code 00-99.*
- *Dial number.*
  To insert a Flash, press FLSH key.
  To insert a Stop, press CONF key.
  To insert a three-second Pause, press RG INW key.
  To insert a DP to Tone (DTMF) Conversion, press #.
- *Hang up or press SPK key.*

To retrieve a System Speed Dial number:

- *Lift handset or press SPK key at any station.*
- *Seize idle CO line.*
- *Press DC key. Dial tone audible.*
- *Enter two-digit code. Number dialed out.* †

† If a Flash, Stop or DP to Tone (DTMF) conversion is programmed, press ✻ to continue dialing when dialing initially ceases.

Station Speed Dial

To store a Station Speed Dial number:

- *Lift handset or press SPK key.*
- *Press DC key. Dial tone audible.*
- *Press ✻. Dial tone ceases.*
- *Press DSS key.*
- *Dial number (maximum of 18 digits).*
  To insert a Flash, press FLSH key.
  To insert a Stop, press CONF key.
  To insert a three-second Pause, press RG INW key.
  To insert a DP to Tone (DTMF) Conversion, press #.
- *Hang up.*

To retrieve a Station Speed Dial number:

- *Lift handset or press SPK key.*
- *Seize idle CO line.*
- *Press DSS key.* † Number dialed out. ††

† If a Flash, Stop or DP to Tone (DTMF) conversion is programmed, press ✻ to continue dialing when dialing initially ceases.

†† If chained numbers are involved, press the next DSS key after the previous one has dialed out.

STEP CALLING (Permanent)

This feature permits a station user to find and call an idle station in the system. The stations are called sequentially from lowest to highest, e.g., if station 11 is busy, then station 12 is called and so on. If at any time during the Step Calling the user's station or an unoccupied port is called, a reorder tone is issued and the procedure is halted.

To initiate Step Calling:

- *Call Intercom station (busy).*
- *Press #. Next idle station automatically receives ringing.*

THREE MINUTE WARNING TONE (Programmable)

This feature permits the initiation of three quick splash tones through a station speaker during an outgoing call. The tones are initiated after every three-minute period.

TOLL RESTRICTION (Programmable)

This feature permits the restriction or limitation of the outward dialing capabilities of selected stations. A station is assigned a Class of Service and is permitted dialing access to those categories of numbers granted by that Class of Service.

TRANSFER RECALL DISPLAY (Permanent)

This feature permits an Executive Display telephone to display the line number of an incoming CO call and the number of the station to which the call is transferred. This feature is available only if a DSS Console is used to transfer the call and the transferred call reverts back to the transferring station.

To initiate Transfer Recall Display:

- *Press OPAC at display telephone.*
- *Press RG INW key on DSS Console. HOLD key lights.*

To Cancel Transfer Recall Display:

- *Press OPAC.*
- *Press RG INW key on DSS Console. HOLD key extinguishes.*

BUSINESSCOM PLUS 24/36/64
ELECTRONIC KEY TELEPHONE SYSTEMS
APPENDIX C
OFF-PREMISES EXTENSION
B-STU-D PCB

CONTENTS PAGE

1. INTRODUCTION

1.01 The B-STU-D Printed Circuit Board (PCB) (Part Number 15181) is used with the Businesscom Plus 24/36/64 Key Telephone Systems as an interface between the Key Service Unit (KSU) and single line telephones. The B-STU-D PCB must also be used if Direct Inward System Access (DISA) is required. It converts off-hook and dialing information to digital data for use by the Main Processing Unit (MPU). Digital data received from the MPU is converted to signals that are processed by single line telephones by the B-STU-D. The B-STU-D PCB can be used with either DTMF or Dial Pulse type telephones. DISA lines must be DTMF type lines. DTMF single line telephones (2500 type) must be served by DTMF Receivers which are installed on the B-STU-D PCB. Up to four MFRU's per B-STU-D are permitted.

NOTE: For simplification, single line telephones installed using this interface PCB will be referred to as Off-Premises Extensions (OPXs). Single line telephones can be installed on-premises or as Off-Premises Extensions (OPXs).

1.02 Each B-STU-D PCB functions as an interface for four single line stations. Only single line telephones can be used with a B-STU-D PCB. The ringing signal provided by an External Ringing Generator to the OPX is controlled by the B-STU-D PCB.

1.03 The maximum number of B-STU-D PCBs that can be installed in a system is as follows:

MAXIMUM NUMBER OF B-STU-D PCBs PER SYSTEM

SYSTEM	NUMBER OF B-STU-Ds
24	3
36	4
64	8

1.04 Specifications for the B-STU-D PCB are provided in Table C-1.

2. FEATURES

2.01 The following paragraphs provide operational specifications for a single line telephone whether on-premises or installed as an Off-Premises Extension (OPX).

ANSWERING A CALL

2.02 Incoming calls can be answered at any Off-Premises Extension. Programming determines which stations receive the signal.

To answer an external call which rings at the OPX:

- *Lift handset.*

PLACING AN EXTERNAL CALL

2.03 External calls can be initiated from any Off-Premises Extension provided that Class Of Service for that extension does not restrict the outgoing call.

To place an external call:

- *Lift handset.*
- *Listen for dial tone.*
- *Dial queue group number (1-4). Listen for CO dial tone.*
- *Dial desired number.*

OR

- *Lift handset. Listen for dial tone.*
- *Dial CO line access code (5).*
- *Dial the idle CO line number in 2 digits (01-24). Listen for outside dial tone.*
- *Dial desired number.*

NOTE:—Dialing 6 accesses the first available line.
—Dialing 0 accesses the first available line that is in any queue group.

LINE QUEUEING

2.04 Line Queueing enables an Off-Premises Extension to queue (wait in line) for an available outside line in a busy line group. The system signals the stations, in order, when the line group is available.

To queue for an outside line:

- *Lift handset.*
- *Dial queue group number (1-4). Listen for CO dial tone.*
- *If CO dial tone is not heard, indicating that all CO lines in that group are busy, dial the queue group number a second time. Intercom dial tone is heard if queue is accepted.*
- *Hang up. The station rings when the desired line becomes available.*
- *Lift handset when phone rings.*
- *Listen for outside dial tone.*
- *Dial desired number.*

PLACING AN INTERNAL CALL

2.05 Internal (Intercom) calls can be answered handsfree at key phones, or by using the handset at any phone.

To place an internal call from an Off-Premises Extension that can be answered handsfree at a key phone.

- *Lift handset. Listen for dial tone.*
- *Dial Intercom access code (7). Listen for Intercom dial tone.*
- *Dial desired station number.*

To place an internal call from an Off-Premises Extension that rings and must be answered with the handset:

- *Lift handset. Listen for dial tone.*
- *Dial Intercom access code (7). Listen for Intercom dial tone.*
- *Dial desired station number.*
- *Dial 1. If call is placed to another OPX, it is not necessary to dial the 1.*

TRANSFER

2.06 Transfer sends an external call from one station to another.

To transfer a call from an Off-Premises Extension:

- *Press and release hookswitch. Listen for Intercom dial tone.*
- *Dial desired station number.*
- *After the called party responds by using the handset (not handsfree), hang up.*

PAGING

2.07 There are three types of Paging: ***All Call, Internal Zone*** and ***External Zone.*** All Call Paging is sent to all external zones and to those stations programmed to receive Paging announcements. Internal Zone Paging provides Paging to a select group of stations. External Zone Paging requires optional customer-provided speakers and other equipment.

All Call Paging

To initiate All Call Paging from an Off-Premises Extension:

- *Lift handset.*
- *Dial 80.*
- *Make announcement.*

Internal Zone Paging

To initiate Internal Zone Paging from an Off-Premises Extension:

- *Lift handset.*
- *Dial the desired internal zone.*
- *Make announcement.*

Internal Zones

Zone 1 - Dial 81
Zone 2 - Dial 82
Zone 3 - Dial 83
Zone 4 - Dial 84

External Zone Paging

To initiate External Zone Paging from an Off-Premises Extension:

- *Lift handset.*
- *Dial the desired external zone.*
- *Make announcement.*

External Zones

Zone 1 - Dial 86
Zone 2 - Dial 87
Zone 1 & 2 - Dial 85

CALL PICKUP

2.08 To intercept an incoming call or to pick up a call on Hold at another station:

- *Lift handset.*
- *Dial 5. Listen for dial tone.*
- *Dial two-digit line number (01-24) of held or ringing CO line.*

3. INSTALLATION

3.01 The following paragraphs provide step-by-step instructions for installing a B-STU-D PCB.

3.02 DTMF signaling requires that a B-MFRU-B PCB be plugged into each CN connector, labeled CN1-CN4, on the B-STU-D PCB serving a DTMF station (Figure C-1).

If using on-premises single line telephones with internal battery, S1 and S2 are strapped 1-2 (Figure C-1). If using Off-Premises Extensions through telco equipment, an external talk battery must be used; S1 and S2 are strapped 2-3 (See Figures C-1 & C-2). Insert the B-STU-D PCB into the appropriate B-STU slot in the KSU.

3.03 To connect each single line station to the Main Distribution Frame (MDF) at the KSU location:

- *Connect the pair of wires from the station to the D clips of the AT/AR pair on the B block corresponding to the station number being installed (Figure C-2, Tables C-2 & C-3).*
- *Install bridging clips.*

3.04 The B-STU-D PCB requires an External Ring Generator such as the TIE Ring Generator (Part Number 12185). This Ring Generator has been designed to work using the 28 volts from the KSU. (Other manufacturer's Ring Generators should not use the 28 volts from the KSU as their primary source of power.)

3.05 If an External Ring Generator is utilized, it must provide non-interrupted ring generator output in the range of 90V at a nominal frequency of 20Hz.

3.06 Each B-STU-D PCB must be connected to a ring generator source. Connections to the MDF are made as follows:

- *Connect the output terminals from the RG to the D clips of the first circuit (BT/BR) pair on the B block (Figure C-2, Tables C-2 & C-3).*
- *Install bridging clips.*
- *Connect the input terminal designated + (from the RG) to the second circuit (BT) clip (Figure C-2, Tables C-2 & C-3).*
- *Connect the input terminal designated G (from the RG) to the second circuit (BR) clip (Figure C-2, Tables C-2 & C-3).*†
- *Install bridging clips.*†

† Omit if the TIE Ring Generator box is **not** used.

3.07 When a B-STU-D PCB is installed utilizing a telco facility (such as an OL13B or OL13C), an earth ground is required. To connect an earth ground:

- *Connect a wire from the fourth circuit (BT/BR) clips to an earth ground (Figure C-2).*
- *Install bridging clips.*

4 BT is used as reference ground for OPXs.

4 BR is used as ground for MOU protection on B-STU-D PCBs.

Also, an external battery is required. To connect an external battery:

- *Connect a wire from the third circuit (BT clip) to the external battery positive terminal, and a wire from the third circuit (BR clip) to the negative terminal. MAKE SURE NEITHER BATTERY TERMINAL IS GROUNDED (Figure C-2).*
- *Install bridging clips.*

NOTE: Each OPX key should be identified at the DSS Console to remind the attendant that call announcing is not possible at an OPX and that it is not possible to override an OPX.

4. PROGRAMMING

4.01 When programming a Businesscom Plus 24, 36 or 64 system use the Maintenance and Installation Manual (01651 IMG Issue).

4.02 The following options must be considered for programming:

a. *If CO line dial access is required, queue groups must be established. System initialization places all lines into queue group number 1.*
b. *Toll and dial or access restrictions are as indicated in the appropriate installation manual.*
c. *DTMF/Dial Pulse Off-Premises Stations require programming.*

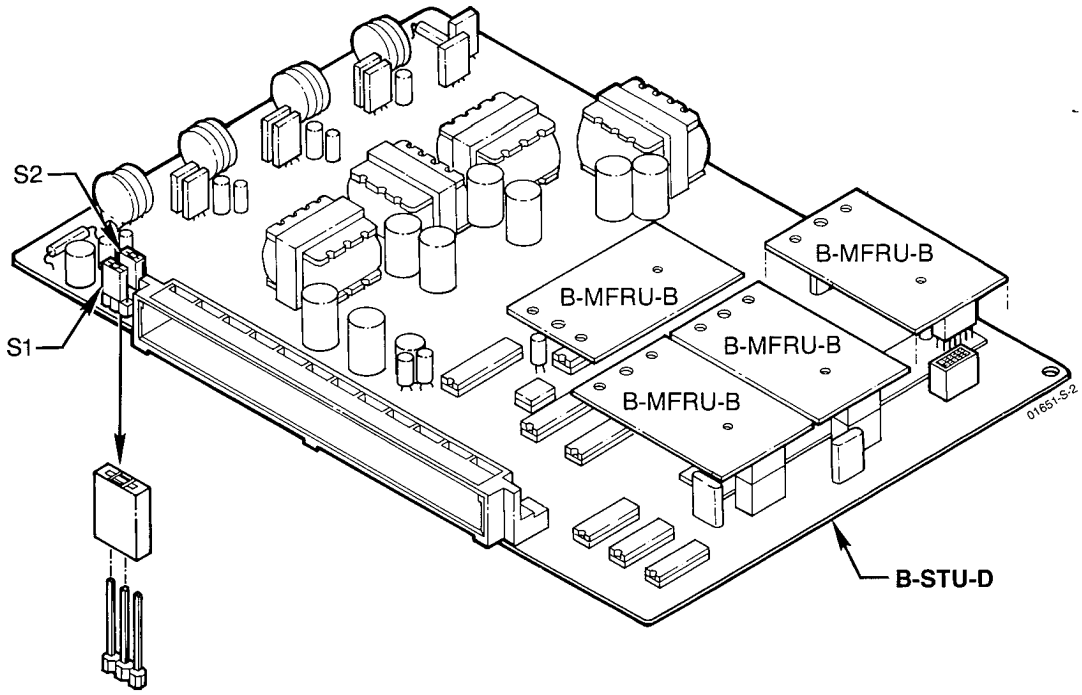

Figure C-1 B-STU-D PRINTED CIRCUIT BOARD

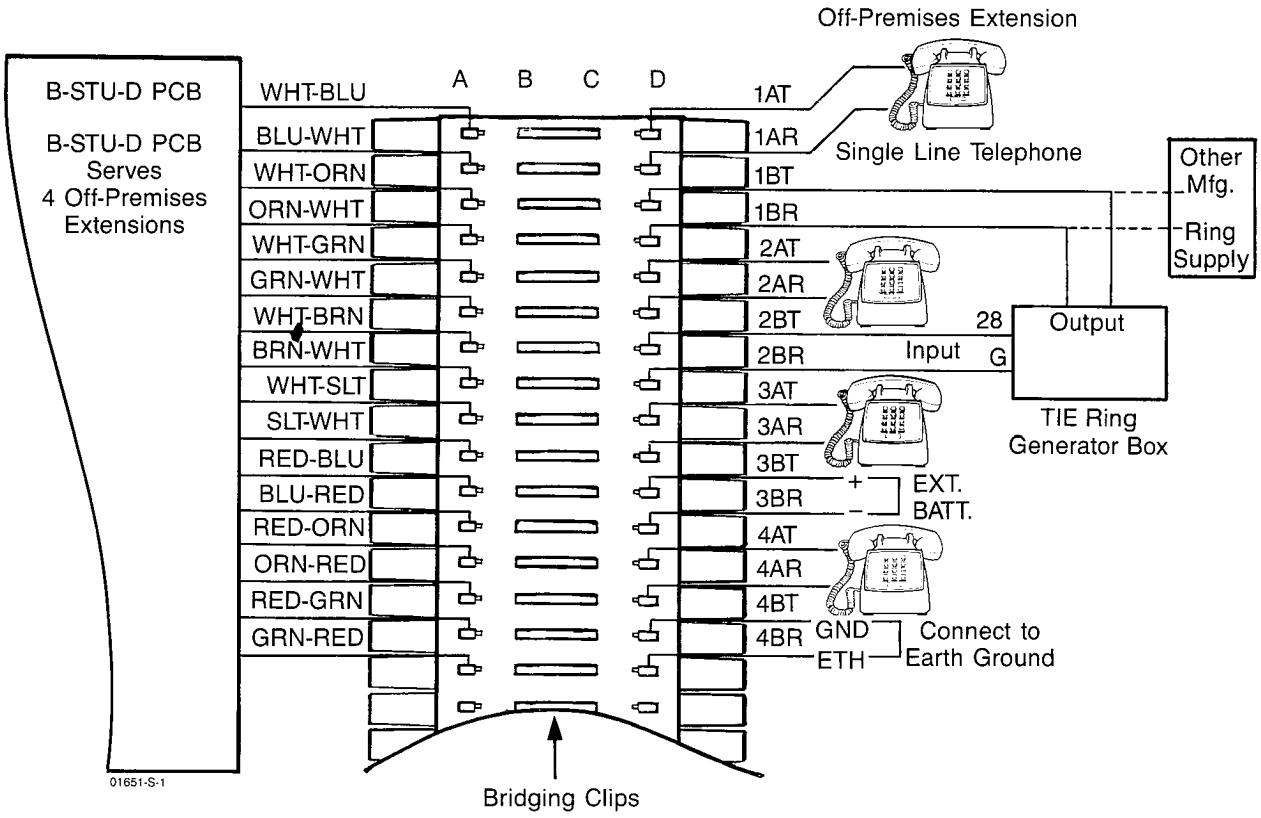

Figure C-2 OFF-PREMISES EXTENSION CONNECTIONS

Table C-1 B-STU-D PCB SPECIFICATIONS

Electrical: Dial Pulse Rate: 10 or 20 Pulses Per Second ± 3PPS Make/Break Ratio: 33/67± 10%
Cable Requirements: On-Premises Single Line Telephone, Internal Battery: Loop Limit (max.) 300 ohms: 22 AWG, 8000 feet (2.4 km) 24 AWG, 5000 feet (1.5 km) Off-Premises Station through TELCO Equipment, External Battery: 24 Volt Battery, OL13B Interface 48 Volt Battery, OL13C Interface

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Table C-2 B-STU-D STATION BLOCK CONNECTIONS

25 PAIR CABLE		"B" CONNECTING BLOCKS		CIRCUIT
Conn Pin	Color Code	Block Term.	Function	Function
26	WHT-BLU	1	AT	TIP Circuit 1
1	BLU-WHT	2	AR	RING Circuit 1
27	WHT-ORN	3	BT	RING Signal In
2	ORN-WHT	4	BR	RING Signal In
28	WHT-GRN	5	AT	TIP Circuit 2
3	GRN-WHT	6	AR	RING Circuit 2
29	WHT-BRN	7	BT	+ [28 V DC
4	BRN-WHT	8	BR	– [OUT
30	WHT-SLT	9	AT	TIP Circuit 3
5	SLT-WHT	10	AR	RING Circuit 3
31	RED-BLU	11	BT	+ EX. 48V
6	BLU-RED	12	BR	– EX. GND
32	RED-ORN	13	AT	TIP Circuit 4
7	ORN-RED	14	AR	RING Circuit 4
33	RED-GRN	15	BT	GND
8	GRN-RED	16	BR	ETH
34	RED-BRN	17	AT	TIP Circuit 1
9	BRN-RED	18	AR	RING Circuit 1
35	RED-SLT	19	BT	RING Signal In
10	SLT-RED	20	BR	RING Signal In
36	BLK-BLU	21	AT	TIP Circuit 2
11	BLU-BLK	22	AR	RING Circuit 2
37	BLK-ORN	23	BT	+ [28 V DC
12	ORN-BLK	24	BR	– [OUT
38	BLK-GRN	25	AT	TIP Circuit 3
13	GRN-BLK	26	AR	RING Circuit 3
39	BLK-BRN	27	BT	+ EX. 48V
14	BRN-BLK	28	BR	– EX. GND
40	BLK-SLT	29	AT	TIP Circuit 4
15	SLT-BLK	30	AR	RING Circuit 4
41	YEL-BLU	31	BT	GND
16	BLU-YEL	32	BR	ETH
42	YEL-ORN	33	AT	TIP Circuit 1
17	ORN-YEL	34	AR	RING Circuit 1
43	YEL-GRN	35	BT	RING Signal In
18	GRN-YEL	36	BR	RING Signal In
44	YEL-BRN	37	AT	TIP Circuit 2
19	BRN-YEL	38	AR	RING Circuit 2
45	YEL-SLT	39	BT	+ [28 V DC
20	SLT-YEL	40	BR	– [OUT
46	VIO-BLU	41	AT	TIP Circuit 3
21	BLU-VIO	42	AR	RING Circuit 3
47	VIO-ORN	43	BT	+ EX. 48V
22	ORN-VIO	44	BR	– EX. GND
48	VIO-GRN	45	AT	TIP Circuit 4
23	GRN-VIO	46	AR	RING Circuit 4
49	VIO-BRN	47	BT	GND
24	BRN-VIO	48	BR	ETH
50	VIO-SLT	49		
25	SLT-VIO	50		

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Table C-3 "B" BLOCK STATION LOCATIONS

PCB POSITION	BLOCK	FOR STATIONS
BSTU-A/D-1 BSTU-A/D-2 BSTU-A/D-3	B1	10 - 13 14 - 17 18 - 21
BSTU-A/D-4 BSTU-A/D-5 BSTU-A/D-6	B2	22 - 25 26 - 29 30 - 33
BSTU-A/D-7 BSTU-A/D-8 BSTU-A/D-9	B3	34 - 37 38 - 41 42 - 45
BSTU-A/D-10 BSTU-A/D-11 BSTU-A/D-12	B4	46 - 49 50 - 53 54 - 57
BSTU-A/D-13 BSTU-A/D-14 BSTU-A/D-15	B5	58 - 61 62 - 65 66 - 69
BSTU-A/D-16	B6	70 - 73

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TECHNICAL ASSISTANCE

When problems or questions arise during installation or servicing that cannot be resolved using this or related documents, contact TIE Technical Service Department as follows:

For assistance between 8:30 AM and 5:00 PM, Eastern time, call:

(203) 926-2033

For assistance in the event of an **ABSOLUTE** emergency at other times than those listed, call:

(203) 929-7920

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SYSTEM PRACTICE
PART NO. 01651 IMG
ISSUE 2-0 FEBRUARY 1986

TIME SET

LEFT HAND

OPAC

CLOCK

YEAR ---- *

-- MONTH -- DATE *

SUN
O *

---- 24 CLOCK *