TONE COMMANDER®

30e120
Installation Instructions

Changes in this revision –

- corrected description of switch positions on page 36

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Contents

Introduction

The Tone Commander 30e is an answering console for use in receptionist or departmental attendant positions, with Centrex or PABX systems. Line keys are provided for up to 30 LDN (Listed Directory Number) terminations or call processing loops. The companion 120 BLF/DSS console adds 24-digit autodialing, and station status display for 120 stations. The 120 console functions are controlled by keys on the 30e console.

Features include hold and transfer, single button call answer, line privacy, delayed ringing, night service, call status display, line and station name displays, Music On Hold, and a digital clock. Console parameters may be programmed by the installer for different system configurations.

A configuration programming mode is used by the installer to set console parameters as required by the telephone system. The attendant may program name displays, autodial numbers, ring delays, and the time-of-day clock. Switches can be set to prevent accidental programming changes.

The system includes a 30e CPU (Central Processing Unit) and a 120 CPU in the equipment room. Four consoles may be connected to a single CPU.

The basic 30e CPU is equipped with ports for 20 lines and two consoles. A 10-line expansion circuit board and a two-console expansion circuit board may be installed in the CPU to increase capacity to a maximum of 30 lines and four consoles, respectively.

The capacity of the 120 CPU is 120 lines. A second CPU and associated consoles may be added to increase system capacity to 240 stations at each position.

Please refer to the <u>System Description</u> section for detailed descriptions of all 30e120 features.

> Call Tone Commander Customer Service at **(800) 524-0024** if you have any questions about features, installation, or operation of the 30e120.

Tone Commander consoles are easy to install and configure. The step-by-step instructions in this manual guide the installer through the installation, preliminary testing, programming, and operational testing of the 30e120.

Installation consists of the following steps:

1. Ordering equipment *(page 5)*
2. Ordering lines *(page 6)*
3. Site preparation *(page 7)*
4. Configuration Sheet preparation *(page 8)*
5. Mounting equipment and blocks
6. Connecting lines to CPUs
7. Installing consoles and console cables
8. Preliminary testing
9. Installing optional equipment (night bell, paging, etc.)
10. Configuration programming – includes central office/PABX compatibility parameters, and several customer-preference items. The system's default values will be adequate for many installations.
11. DSS/Autodial number programming (with 120 console only)
12. Name display programming (with 120 console only)
13. Ring delay programming

1. Ordering Equipment

Order the optional PA-24 Paging/Chime Module and related equipment as required. Allow adequate time to ensure equipment availability at cutover.

Required for each 30e system

❑ (1) 30e Central Processing Unit (equipped for 20 attendant lines and 2 consoles)

❑ (1) 30e console for each attendant position (4 max.)

Required for systems with 21-30 attendant lines

❑ (1) LEC-10 Line Expansion Card

Required for systems with 3 or 4 consoles

❑ (1) CEC-2 Console Expansion Card

❑ (1-2) PSE-3 Power Supplies
      (each CPU can supply power to two 30e or 120 consoles; one PSE-3 is required to power every three additional 30e or 120 consoles)

Required for BLF/DSS option

❑ (1) 120 Central Processing Unit per 120 stations (2 CPUs max.)

❑ (1) 120 consoles per 120 stations (240 max..) for each attendant position

Additional required equipment

❑ (1) 66M1-50 split block + (1) male-terminated 25-pair cable

❑ (1) 66M1-50 split block + (2) female-terminated 25 pair cables for lines
      (only one cable required for 20 lines or less)

❑ (1) 66M1-50 split block + (2) female-terminated 25-pair cables per each 30 monitored stations
      (each 25-pair cable handles 15 stations)

❑ (2) 3 pair cables from the CPU to each console (500 ft. maximum length)

❑ (2) 6 position, 6 contact modular jacks per console

❑ (1) 117 VAC, 60 Hz grounded power outlet per CPU in the equipment room

❑ Sufficient space on a plywood sheet in the equipment room for mounting CPU, blocks, and ancillary equipment

❑ Cross connect wire and mounting hardware

2. Ordering Lines

IMPORTANT – The line features listed below are **required** for proper operation of the 30e and 120 consoles. Allow adequate time prior to cutover for the receipt and testing of all lines and programmed features.

Please refer to the <u>System Description</u> section for further information regarding line requirements.

Common requirements for all attendant and station lines

- ❑ Standard Centrex loop start lines
- ❑ Disconnect Supervision
- ❑ Call Pickup Terminate
- ❑ Must originate from the same Centrex Common Block

Requirements for all attendant lines

- ❑ Tone dialing
- ❑ Station Call Transfer
- ❑ Directed Call Pickup *without* Barge-In (non-Barge-In)
- ❑ *Do not* configure with Call Transfer-Attendant

Optional attendant line features

- ❑ Order (1) nonhunting Centrex line per 10 attendant lines per console (recommended for retrieving unanswered station calls). Refer to the <u>Answer Use</u> line feature described on page 54.

Requirements for all station lines

- ❑ Must be assigned to a Call Pickup Group
- ❑ *Do not* configure with Call Forward-No Answer to the attendant

Optional station/line features

Additional features may be optioned as required.

3. Site Preparation

Central Processing Unit (CPU)

The Central Processing Unit (CPU) should be installed in a clean, *dry* area which is secure but also accessible by maintenance personnel. This unit is designed for wall mounting only. Allow adequate wall space for ventilation, the necessary mounting blocks, and related equipment.

Ambient Environmental Requirements

1. Between 60° and 80° F (recommended).

2. Free of toxic fumes or static electricity (copiers).

3. At least 50 feet away from electromagnetic sources (arc welders).

4. Free from transient electrical load switching equipment (elevator rooms).

5. Between 5% and 95% noncondensing relative humidity.

Power Requirements

A dedicated, 15 amp, 117 VAC, 60 Hz circuit must be provided for the exclusive use of the CPU.

IMPORTANT – Ancillary or unrelated equipment should never draw power from the same circuit that powers the CPU.

The ground (3rd prong) on the power plug provides a safety ground to the chassis of the CPU, and is required for EMI shielding. It must be plugged into a grounded outlet.

Transient Surge and Spike Protection

While Tone Commander products comply to FCC rules part 68.306, Hazard Voltage Limitations, in those areas of high lightning activity, the use of external protection devices on all telephone lines and the power source is recommended.

Reference Grounding

Reference grounding of the 30e120 system is necessary for proper operation. This ground should be referenced to within 3 volts of telco ground.

Attendant Consoles

The consoles should be installed in a clear work space and away from plants that require frequent watering or counters that tempt the placement of beverages.

Ambient Environmental Requirements

It is recommended that the same environmental conditions be maintained for the consoles as one would maintain for a personal computer (PC) or data terminal.

Power Requirements

Console operating power is provided by the CPUs or a PSE-3 power supply located in the equipment room.

4. Configuration Sheet Preparation

Prior to installation of this system, the Configuration Sheets attached to the back of this manual should be completed with the information listed below. **Please leave the Configuration Sheets on site.**

System Programmable Features

Factory programmed values have been chosen to accommodate standard central office or PABX operating parameters and generally accepted customer requirements. These values may be adjusted to specific needs.

A space is provided on the Configuration Sheet for the Directed Call Pickup code required by the telephone system.

Station and Line Programmable Features

1. Phone number and name identification for each line.

2. Programmable features for each line (Privacy, Answer Use).

3. Station number and user name identification for each station. Include any additional functions to be dialed with the DSS number, such as an *FD* prefix.

4. Autodial numbers for spare DSS keys.

Sample Configuration Sheets are provided on the following three pages.

30e Configuration Sheet
System Programmable Features

STATION KEY	FEATURE	DIAL PAD KEYS	AVAILABLE VALUES	DEFAULT VALUE	ACTUAL VALUE
A	'ABANDON' Ring Time	2 - 9, 0	2 - 9 sec, 10 sec	5	5
B	'RECALL' Rings	1 - 9, 0	1 - 9 rings, no recall	3	3
C	'DCP DIAL' Sequence	0, 1	first, last	first (0)	first
D	'DIAL SPEED'	6, 0	slow (6 digits/sec), fast (10 digits/sec)	fast (0)	fast
E	'PAUSE' Time	2 - 9	200 - 900 msec	700	700
F	'FLASH' Time	5 - 9, 0	500 - 900 msec, 1 sec	600	500
G	Dial Tone 'DETECT' Time	1 - 9, 0	500, 600, 700 msec, 1, 1.2, 1.5, 1.8, 2 sec	700	600
H	'HOLD' Recall Time	3 - 6, 9, 1, 2, 0	30 - 60, 90 sec, 2, 3 min, no recall	90	60
I	Hold 'RELEASE' Time	1 - 8	45, 80, 200, 400, 600, 800 msec 1, 2 sec	600	600
J	'PARK' Recall Time	3 - 6, 9, 1, 2	30 - 60, 90 sec, 2, 3 min	90	60
K	Night 'BELL' Mode	1, 2	lines only, lines + stations	lines only (1)	lines only
L	Queue 'PRIORITY'	1 - 4	stations only, stations > lines, lines > stations, lines + stations (FIFO)	FIFO (4)	FIFO
M	'ALERT TYPE'	1, 2, 0	normal ringing, distinctive ringing, both	both (0)	both
N	'RNG TYPE'	1, 0	long, short	short (0)	short
O	'SYSTEM CAMP-ON'	0, *	off, on	off (0)	on
P	'RECORD STATS"	0, *	off, on	on (1)	on

DIRECTED CALL PICKUP CODE	D*7

30e Configuration Sheet
Line Programmable Features

(Default settings for all lines are shown in ***BOLD ITALICS***.)

LINE KEY NO.	LINE NAME I.D. or SPECIAL USAGE KEY • **Page** • **Night** • **Quick Mode** • **Override** • **Call Park**	PRIV. WHEN BUSY		ANS. USE		RING DELAY (***NO RINGING***, NO DELAY, 1-9 RINGS)	TELEPHONE NUMBERS
		OFF	ON	***OFF***	ON		
1	local 1	X		X		no delay	555-1980
2	local 2	X		X		no delay	555-1981
3	local 3	X			X	no delay	555-1982
4	local 4	X			X	no delay	555-1983
5	WATS band 0	X		X		no delay	208-3559
6	WATS band 5	X		X		no delay	280-7290
7	Hilldale FX	X		X		no delay	287-4739
8							
9							
10							
11	Page key		X	X		no ring	N/A
12							
13	Quick Mode key		X	X			
14	Override key		X	X		no ring	N/A
15	Call Park key		X	X		no ring	N/A

120 (#1) Configuration Sheet, DSS Keys 1-60

DSS keys are numbered vertically on the console.

DSS KEY	DSS / AUTODIAL NUMBER (24 digits max.)	USER NAME (14 characters max.)	DSS KEY	DSS / AUTODIAL NUMBER (24 digits max.)	USER NAME (14 characters max.)
1	FD4710	John F	31	FD4740	Susan R
2	FD4719	Bill Jones	32	FD4742	Rick T
3	FD4729	Jill K	33	FD4743	Linda P
4	FD4711	Jane W	34	FD4741	Ralf C
5	FD4712	Ronnie Y	35	FD4744	Greg O
6	FD4715	Kim L	36	FD4747	Sally T
7	FD4720	Jack S	37	FD4745	Bob W
8	FD4716	William F	38	FD4746	Clint E
9	FD4717	Sarah S	39	FD4748	Don R
10	FD4718	Robin R	40	FD4749	Katy C
11	FD4721	John L	41	FD4750	John F
12	FD4722	Bill T	42		
13	FD4737	Mike N	43		
14	FD4736	David T	44		
15	FD4723	Wayne K	45		
16	FD4713	Phillip R	46		
17	FD4714	Mary S	47		
18	FD4724	Steven E	48		
19	FD4725	Karen G	49		
20	FD4726	Robert T	50		
21	FD4727	Jim W	51		
22	FD4728	Pat K	52		
23	FD4730	Randy A	53		
24	FD4731	Kirk B	54		
25	FD4732	Cliff M	55		
26	FD4738	Paul C	56		
27	FD4739	Norm D	57		
28	FD4733	Art S	58		
29	FD4734	Jo P	59		
30	FD4735	Larry E	60		

Installation

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                 Important Safety Instructions

  1. Never install telephone wiring during a lightning storm.

  2. Never install telephone jacks in wet locations unless the jack is
     specifically designed for wet locations.

  3. Never touch uninsulated telephone wires or terminals unless the
     telephone line has been disconnected at the network interface.

  4. Use caution when installing or modifying telephone lines.
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Contents of Shipping Boxes

The Tone Commander 30e120 system is shipped in four boxes: one for each console, and one for each Central Processing Unit (CPU). Please compare the contents of these boxes with the lists below. Contact your distributor if any items are missing or damaged.

30e Console Box:

(1)	30e console	(1)	Attendant's Guide
(2)	7´ line cords	(1)	Quick Reference Card
(1)	handset with cord	(31)	clear keycaps
(1)	handset cradle	(4)	sheets of keycap labels
(2)	cradle mounting screws		

30e CPU Box:

(1)	30e CPU	(1)	mounting template
(1)	30e120 Installation Instructions	(3)	cable retainers

120 Console Box:

(1)	120 console	(1)	Attendant's Guide
(1)	7´ line cord	(1)	Quick Reference Card
(1)	12" line cord	(61)	clear keycaps
(1)	console tie bracket	(2)	sheets of keycap labels
(4)	tie bracket mounting screws		

120 CPU Box:

(1)	120 CPU	(1)	mounting template
(1)	30e120 Installation Instructions	(4)	cable retainers

CPU Installation

Refer to Figures 1 and 2.

Mounting CPUs

Refer to Figure 5.

1. Fasten a plywood sheet to the wall with hardware suitable for the wall material. The sheet should have enough room for all 30e and 120 CPUs, and any required ancillary equipment such as expansion console and night bell power supplies.

2. Using the supplied mounting template, mark and pre-drill the mounting holes for the 30e CPU.

   Make sure that the CPU mounting location is within 5 feet of a standard 117 VAC, 60 Hz grounded power outlet.

   Allow at least one foot of free space above and below the CPU for ventilation.

3. Drive in four suitable fasteners (such as #10×¾" pan head tapping screws), leaving the heads out ¼".

4. Remove the two cover screws, turn each CPU cover fastener so that the slots are horizontal, then remove the cover.

   When installation and testing are completed, replace the cover, turn each cover fastener so that the slots are vertical, then lock it in place with the cover screws to assure compliance with UL requirements. *If the cover screws need to be replaced, use 6-32×1/4" pan head machine screws.*

5. Hang the 30e CPU on the four mounting screws and tighten the screws.

6. Repeat steps 2-5 for each 120 CPU.

   Two 120 CPUs are required for systems that will monitor 121-240 stations.

7. Repeat steps 2-5 for each PSE-3 Expansion Power Supply. Only two mounting screws are required for each power supply.

Each 30e or 120 CPU can power two consoles. PSE-3 power supplies are required for systems with three or four consoles at each attendant position. One PSE-3 can power three 30e or 120 consoles.

> **All CPUs and PSE-3s must be powered from the same outlet box or power strip.**

Blocks

30e

1. Label each side of two split terminal blocks as shown in the Connector Designation columns of Tables 1 and 2.

2. Mount the blocks to the plywood sheet below the 30e CPU, using suitable fasteners.

120

1. Label each side of four split terminal blocks as shown in the Connector Designation columns of Tables 3-6.

   NOTE – Some cables and blocks may be omitted if the system will monitor less than 120 stations. Each cable has connections for 15 stations. Block #1 is required for console power.

2. Mount the blocks to the plywood sheet below the 120 CPU, using suitable fasteners.

Tone Commander 30e120 Installation Instructions

PSE-3

1. Label one side of a terminal block as shown in the Connector Designation column of Table 7.

2. Mount the block to the plywood sheet near the other system blocks, using suitable fasteners.

Cabling to Blocks

1. Punch down the cables to the blocks as shown in the Wire Color columns of Tables 1-7.

2. Plug the 25 pair cables into the appropriate CPU or power supply connectors. Route the cables through the slots at the bottom of the housings.

3. Secure the cables with the supplied connector clamps.

30e Expansion Cards

The basic 30e CPU can accommodate 20 attendant lines and two consoles. One LEC-10 Line Expansion Card (10 additional lines) and/or a CEC-2 Console Expansion Card (two additional consoles) may be installed in the 30e CPU to expand the system to 30 attendant lines and four consoles.

> *The CPU power cord must be unplugged before installing expansion cards.*

LEC-10 Line Card

The CPU is supplied with two LEC-10s installed in the leftmost slots, for attendant lines 1-20.

Plug the expansion LEC-10 into the connectors on the 30e CPU board. The components should face the right side of the 30e CPU.

CEC-2 Console Card

Plug the CEC-2 into the connectors in the center of the 30e CPU main circuit board. The components should face the right side of the CPU.

NOTE – A PSE-3 power supply is required for console positions #3 and #4. This unit can power three 30e and/or 120 consoles.
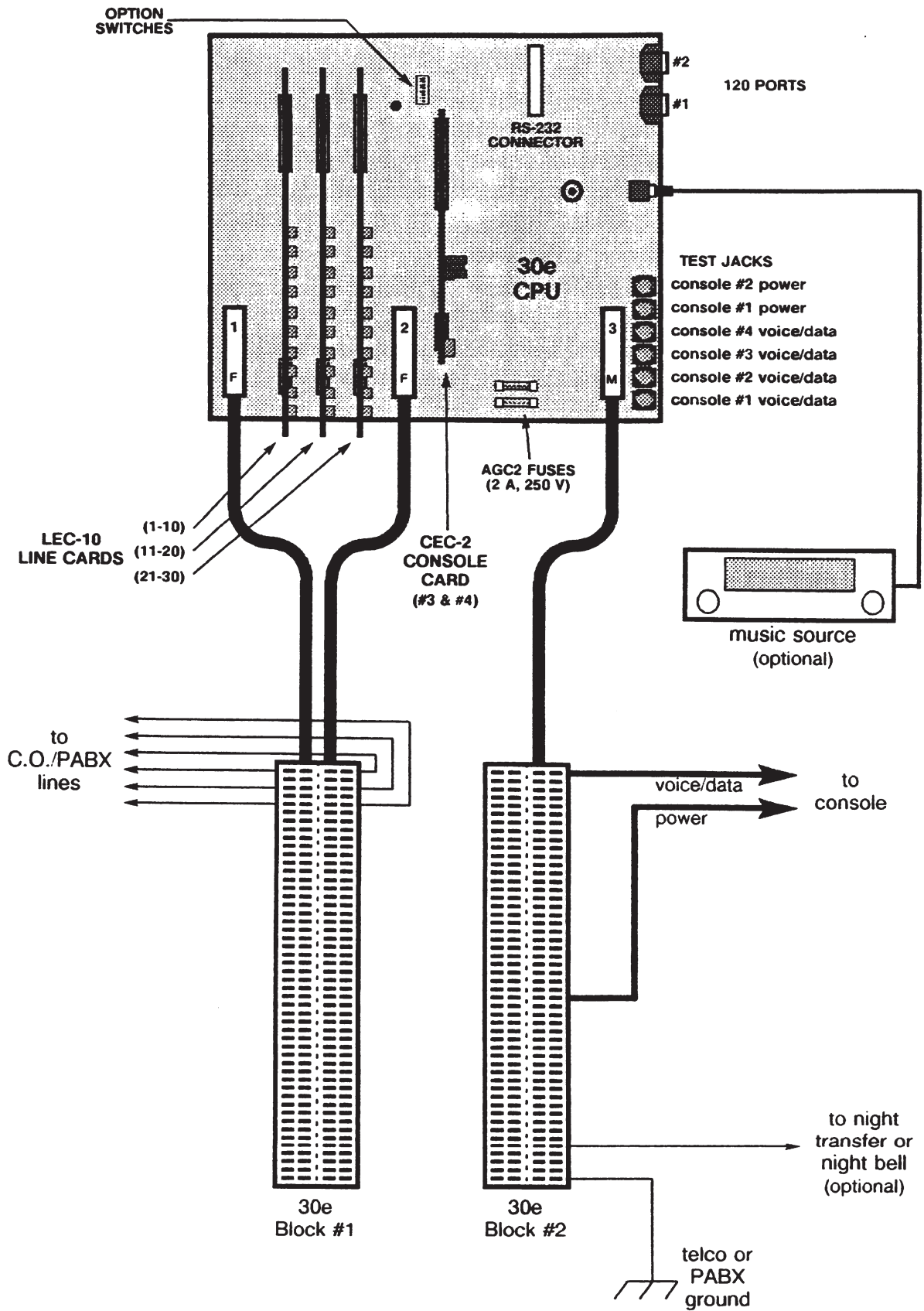
Figure 1 – **30e Typical Installation**
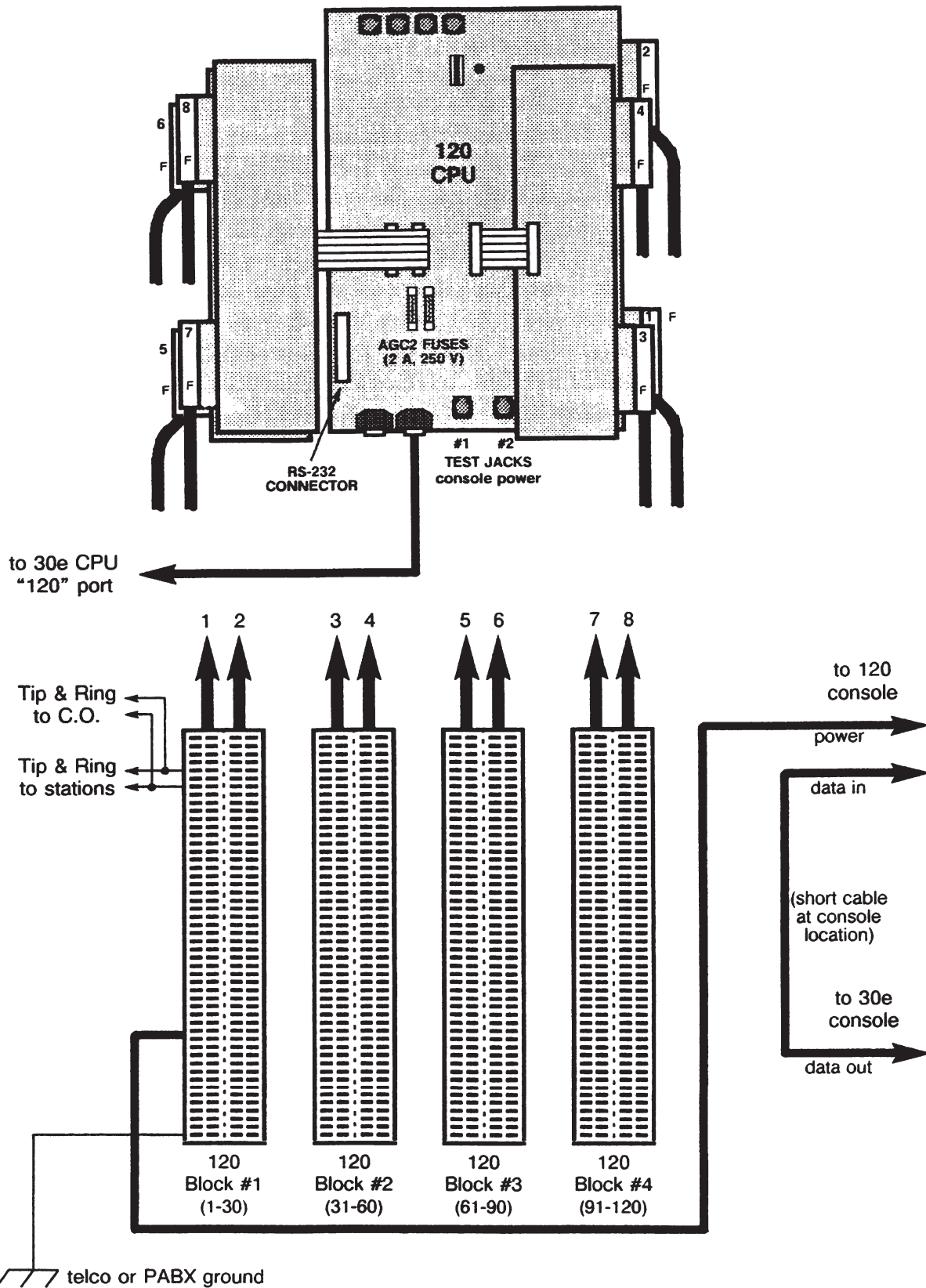
Figure 2 – 120 Typical Installation

PIN NO.	WIRE COLOR	CONNECTOR #1 DESIGNATION (left)	CONNECTOR #2 DESIGNATION (right)
26	WHT-BLU	1T	21T
1	BLU-WHT	1R	21R
27	WHT-ORN	2T	22T
2	ORN-WHT	2R	22R
28	WHT-GRN`	3T	23T
3	GRN-WHT	3R	23R
29	WHT-BRN	4T	24T
4	BRN-WHT	4R	24R
30	WHT-SLT	5T	25T
5	SLT-WHT	5R	25R
31	RED-BLU	6T	26T
6	BLU-RED	6R	26R
32	RED-ORN	7T	27T
7	ORN-RED	7R	27R
33	RED-GRN	8T	28T
8	GRN-RED	8R	28R
34	RED-BRN	9T	29T
9	BRN-RED	9R	29R
35	RED-SLT	10T	30T
10	SLT-RED	10R	30R
36	BLK-BLU	11T	—
11	BLU-BLK	11R	—
37	BLK-ORN	12T	—
12	ORN-BLK	12R	—
38	BLK-GRN	13T	—
13	GRN-BLK	13R	—
39	BLK-BRN	14T	—
14	BRN-BLK	14R	—
40	BLK-SLT	15T	—
15	SLT-BLK	15R	—
41	YEL-BLU	16T	—
16	BLU-YEL	16R	—
42	YEL-ORN	17T	—
17	ORN-YEL	17R	—
43	YEL-GRN	18T	—
18	GRN-YEL	18R	—
44	YEL-BRN	19T	—
19	BRN-YEL	19R	—
45	YEL-SLT	20T	—
20	SLT-YEL	20R	—
46	VIO-BLU	—	—
21	BLU-VIO	—	—
47	VIO-ORN	—	—
22	ORN-VIO	—	—
48	VIO-GRN	—	—
23	GRN-VIO	—	—
49	VIO-BRN	—	—
24	BRN-VIO	—	—
50	VIO-SLT	—	—
25	SLT-VIO	—	—

telco/PABX lines

Table 1
**30e Block #1
Pinout**

PIN NO.	WIRE COLOR	(left side of block unused)	CONNECTOR #3 DESIGNATION (right)	
26	WHT-BLU	–	1TN	
1	BLU-WHT	–	1RN	
27	WHT-ORN	–	1C1	console #1
2	ORN-WHT	–	1C2	voice/data
28	WHT-GRN	–	1C3	
3	GRN-WHT	–	1C4	
29	WHT-BRN	–	2TN	
4	BRN-WHT	–	2RN	
30	WHT-SLT	–	2C1	console #2
5	SLT-WHT	–	2C2	voice/data
31	RED-BLU	–	2C3	
6	BLU-RED	–	2C4	
32	RED-ORN	–	3TN	
7	ORN-RED	–	3RN	
33	RED-GRN	–	3C1	console #3
8	GRN-RED	–	3C2	voice/data
34	RED-BRN	–	3C3	
9	BRN-RED	–	3C4	
35	RED-SLT	–	4TN	
10	SLT-RED	–	4RN	
36	BLK-BLU	–	4C1	console #4
11	BLU-BLK	–	4C2	voice/data
37	BLK-ORN	–	4C3	
12	ORN-BLK	–	4C4	
38	BLK-GRN	–	–	
13	GRN-BLK	–	–	
39	BLK-BRN	–	1C+	
14	BRN-BLK	–	1C-	
40	BLK-SLT	–	1C+	console #1
15	SLT-BLK	–	1C-	power
41	YEL-BLU	–	1C+	
16	BLU-YEL	–	1C-	
42	YEL-ORN	–	–	
17	ORN-YEL	–	–	
43	YEL-GRN	–	2C+	
18	GRN-YEL	–	2C-	
44	YEL-BRN	–	2C+	console #2
19	BRN-YEL	–	2C-	power
45	YEL-SLT	–	2C+	
20	SLT-YEL	–	2C-	
46	VIO-BLU	–	–	
21	BLU-VIO	–	–	
47	VIO-ORN	–	MH+	music input
22	ORN-VIO	–	MH-	
48	VIO-GRN	–	–	
23	GRN-VIO	–	NTNC	
49	VIO-BRN	–	NTCO	night relay
24	BRN-VIO	–	NTNO	
50	VIO-SLT	–	–	
25	SLT-VIO	–	GRD	telco ground

**Table 2
30e Block #2
Pinout**

PIN NO.	WIRE COLOR	CONNECTOR #1 DESIGNATION (left)	CONNECTOR #2 DESIGNATION (right)	
26	WHT-BLU	T1	T16	
1	BLU-WHT	R1	R16	
27	WHT-ORN	T2	T17	
2	ORN-WHT	R2	R17	
28	WHT-GRN	T3	T18	
3	GRN-WHT	R3	R18	
29	WHT-BRN	T4	T19	
4	BRN-WHT	R4	R19	
30	WHT-SLT	T5	T20	
5	SLT-WHT	R5	R20	
31	RED-BLU	T6	T21	
6	BLU-RED	R6	R21	
32	RED-ORN	T7	T22	
7	ORN-RED	R7	R22	
33	RED-GRN	T8	T23	
8	GRN-RED	R8	R23	station monitor circuits
34	RED-BRN	T9	T24	
9	BRN-RED	R9	R24	
35	RED-SLT	T10	T25	
10	SLT-RED	R10	R25	
36	BLK-BLU	T11	T26	
11	BLU-BLK	R11	R26	
37	BLK-ORN	T12	T27	
12	ORN-BLK	R12	R27	
38	BLK-GRN	T13	T28	
13	GRN-BLK	R13	R28	
39	BLK-BRN	T14	T29	
14	BRN-BLK	R14	R29	
40	BLK-SLT	T15	T30	
15	SLT-BLK	R15	R30	
41	YEL-BLU	–	–	
16	BLU-YEL	–	–	
42	YEL-ORN	1C+	–	
17	ORN-YEL	1C-	–	
43	YEL-GRN	1C+	–	console #1 power
18	GRN-YEL	1C-	–	
44	YEL-BRN	1C+	–	
19	BRN-YEL	1C-	–	
45	YEL-SLT	–	–	
20	SLT-YEL	–	–	
46	VIO-BLU	2C+	–	
21	BLU-VIO	2C-	–	
47	VIO-ORN	2C+	–	
22	ORN-VIO	2C-	–	console #2 power
48	VIO-GRN	2C+	–	
23	GRN-VIO	2C-	–	
49	VIO-BRN	–	–	
24	BRN-VIO	–	–	
50	VIO-SLT	–	–	
25	SLT-VIO	GRD	–	

**Table 3
120 Block #1
Pinout**

PIN NO.	WIRE COLOR	CONNECTOR #3 DESIGNATION (left)	CONNECTOR #4 DESIGNATION (right)	
26	WHT-BLU	T31	T46	
1	BLU-WHT	R31	R46	
27	WHT-ORN	T32	T47	
2	ORN-WHT	R32	R47	
28	WHT-GRN	T33	T48	
3	GRN-WHT	R33	R48	
29	WHT-BRN	T34	T49	
4	BRN-WHT	R34	R49	
30	WHT-SLT	T35	T50	
5	SLT-WHT	R35	R50	
31	RED-BLU	T36	T51	
6	BLU-RED	R36	R51	
32	RED-ORN	T37	T52	
7	ORN-RED	R37	R52	
33	RED-GRN	T38	T53	station monitor circuits
8	GRN-RED	R38	R53	
34	RED-BRN	T39	T54	
9	BRN-RED	R39	R54	
35	RED-SLT	T40	T55	
10	SLT-RED	R40	R55	
36	BLK-BLU	T41	T56	
11	BLU-BLK	R41	R56	
37	BLK-ORN	T42	T57	
12	ORN-BLK	R42	R57	
38	BLK-GRN	T43	T58	
13	GRN-BLK	R43	R58	
39	BLK-BRN	T44	T59	
14	BRN-BLK	R44	R59	
40	BLK-SLT	T45	T60	
15	SLT-BLK	R45	R60	
41	YEL-BLU	—	—	
16	BLU-YEL	—	—	
42	YEL-ORN	—	—	
17	ORN-YEL	—	—	
43	YEL-GRN	—	—	
18	GRN-YEL	—	—	
44	YEL-BRN	—	—	
19	BRN-YEL	—	—	
45	YEL-SLT	—	—	
20	SLT-YEL	—	—	
46	VIO-BLU	—	—	
21	BLU-VIO	—	—	
47	VIO-ORN	—	—	
22	ORN-VIO	—	—	
48	VIO-GRN	—	—	
23	GRN-VIO	—	—	
49	VIO-BRN	—	—	
24	BRN-VIO	—	—	
50	VIO-SLT	—	—	
25	SLT-VIO	—	—	

**Table 4
120 Block #2
Pinout**

PIN NO.	WIRE COLOR	CONNECTOR #5 DESIGNATION (left)	CONNECTOR #6 DESIGNATION (right)	
26	WHT-BLU	T61	T76	
1	BLU-WHT	R61	R76	
27	WHT-ORN	T62	T77	
2	ORN-WHT	R62	R77	
28	WHT-GRN	T63	T78	
3	GRN-WHT	R63	R78	
29	WHT-BRN	T64	T79	
4	BRN-WHT	R64	R79	
30	WHT-SLT	T65	T80	
5	SLT-WHT	R65	R80	
31	RED-BLU	T66	T81	
6	BLU-RED	R66	R81	
32	RED-ORN	T67	T82	
7	ORN-RED	R67	R82	station monitor circuits
33	RED-GRN	T68	T83	
8	GRN-RED	R68	R83	
34	RED-BRN	T69	T84	
9	BRN-RED	R69	R84	
35	RED-SLT	T70	T85	
10	SLT-RED	R70	R85	
36	BLK-BLU	T71	T86	
11	BLU-BLK	R71	R86	
37	BLK-ORN	T72	T87	
12	ORN-BLK	R72	R87	
38	BLK-GRN	T73	T88	
13	GRN-BLK	R73	R88	
39	BLK-BRN	T74	T89	
14	BRN-BLK	R74	R89	
40	BLK-SLT	T75	T90	
15	SLT-BLK	R75	R90	
41	YEL-BLU	—	—	
16	BLU-YEL	—	—	
42	YEL-ORN	—	—	
17	ORN-YEL	—	—	
43	YEL-GRN	—	—	
18	GRN-YEL	—	—	
44	YEL-BRN	—	—	
19	BRN-YEL	—	—	
45	YEL-SLT	—	—	
20	SLT-YEL	—	—	
46	VIO-BLU	—	—	
21	BLU-VIO	—	—	
47	VIO-ORN	—	—	
22	ORN-VIO	—	—	
48	VIO-GRN	—	—	
23	GRN-VIO	—	—	
49	VIO-BRN	—	—	
24	BRN-VIO	—	—	
50	VIO-SLT	—	—	
25	SLT-VIO	—	—	

Table 5
120 Block #3 Pinout

PIN NO.	WIRE COLOR	CONNECTOR #7 DESIGNATION (left)	CONNECTOR #8 DESIGNATION (right)
26	WHT-BLU	T91	T106
1	BLU-WHT	R91	R106
27	WHT-ORN	T92	T107
2	ORN-WHT	R92	R107
28	WHT-GRN	T93	T108
3	GRN-WHT	R93	R108
29	WHT-BRN	T94	T109
4	BRN-WHT	R94	R109
30	WHT-SLT	T95	T110
5	SLT-WHT	R95	R110
31	RED-BLU	T96	T111
6	BLU-RED	R96	R111
32	RED-ORN	T97	T112
7	ORN-RED	R97	R112
33	RED-GRN	T98	T113
8	GRN-RED	R98	R113
34	RED-BRN	T99	T114
9	BRN-RED	R99	R114
35	RED-SLT	T100	T115
10	SLT-RED	R100	R115
36	BLK-BLU	T101	T116
11	BLU-BLK	R101	R116
37	BLK-ORN	T102	T117
12	ORN-BLK	R102	R117
38	BLK-GRN	T103	T118
13	GRN-BLK	R103	R118
39	BLK-BRN	T104	T119
14	BRN-BLK	R104	R119
40	BLK-SLT	T105	T120
15	SLT-BLK	R105	R120
41	YEL-BLU	—	—
16	BLU-YEL	—	—
42	YEL-ORN	—	—
17	ORN-YEL	—	—
43	YEL-GRN	—	—
18	GRN-YEL	—	—
44	YEL-BRN	—	—
19	BRN-YEL	—	—
45	YEL-SLT	—	—
20	SLT-YEL	—	—
46	VIO-BLU	—	—
21	BLU-VIO	—	—
47	VIO-ORN	—	—
22	ORN-VIO	—	—
48	VIO-GRN	—	—
23	GRN-VIO	—	—
49	VIO-BRN	—	—
24	BRN-VIO	—	—
50	VIO-SLT	—	—
25	SLT-VIO	—	—

station monitor circuits

Table 6
120 Block #4 Pinout

Tone Commander 30e120 Installation Instructions

Data Link Cable

port for
120 CPU #2
(stations
121-240)

120
port #1
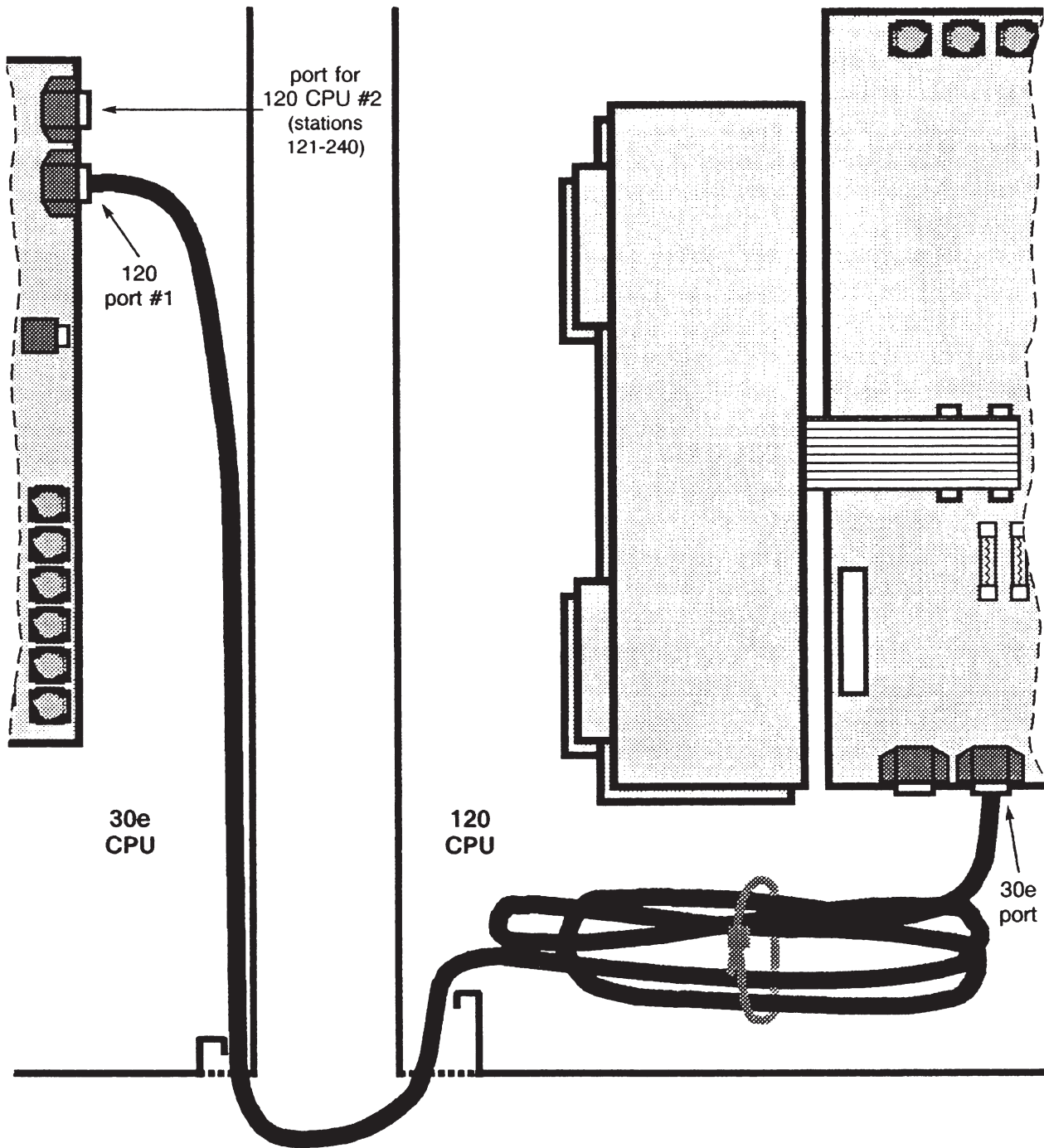
30e
CPU

120
CPU

30e
port

Figure 3

1. Plug the supplied data link cable to the "30e" port on the 120 CPU.

2. Plug the other end of the cable to the lower "120" port on the 30e CPU.

3. Route the cable through the slots at the bottom of the CPU housings.

4. ***Excess cable must be stored in the 120 CPU as shown to assure FCC Part 15 compliance.*** Secure with a cable tie.

5. If this installation has two 120 CPUs (121-240 stations), connect the second 120 CPU to the upper "120" port on the 30e CPU.

Reference Grounding

Reference grounding of the system is necessary for proper operation.
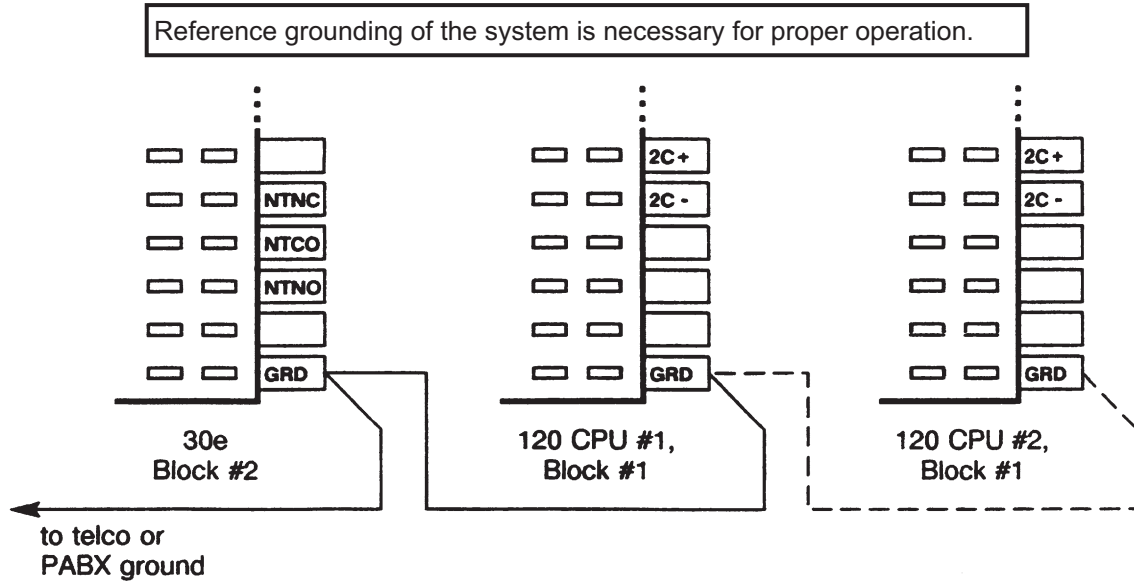
Figure 4

1. Connect telco or PABX ground to the GRD pin on the bottom of 30e block #2.

2. For each 120 CPU, connect telco or PABX ground to the GRD pin on the bottom right of 120 block #1. These connections may be "daisy chained" as shown.

   DO NOT connect this reference ground to the metal housing of any CPU or power supply!

CPU Chassis Grounding

This ground connection is required for safety and EMI shielding. It is usually provided by the 3rd wire on the CPU power cords. If the integrity of the power outlet ground is questionable, use the ground connection shown below for each 30e and 120 CPU.
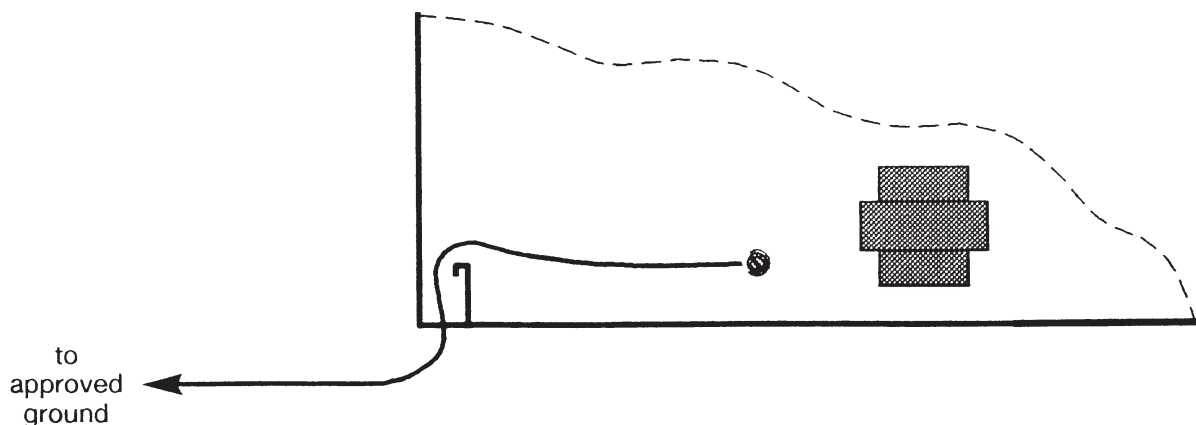
Figure 5

1. Connect a solid copper #10 or #12 AWG wire to the ground terminal on the CPU. The wire should be tightly clamped between the ground screw and the cup washer.

2. Connect the wire to an approved ground, such as MGN (multi-grounded neutral) from the power lines, building ground, a metallic cold water pipe, or a grounding rod.

Tone Commander 30e120 Installation Instructions

Connections to Telco/PABX Lines
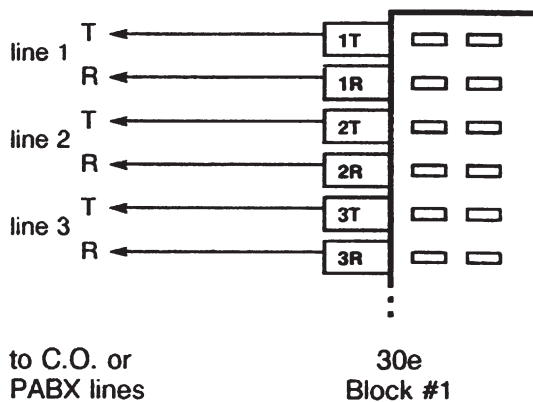
1. Connect Tip and Ring of each line to the associated *T* and *R* pair on the right side of 30e block #1.

   If the 30e is used with a key system, connect to the C.O. side of the line cards.

2. If this installation has stations in parallel with console lines, the stations should be connected to Tip and Ring at the telco/PABX block.
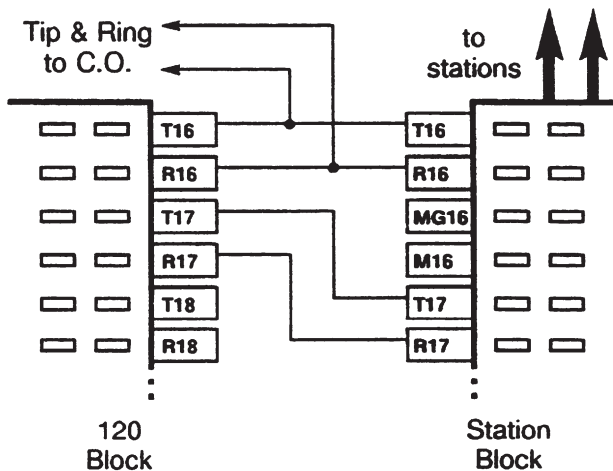
Figure 6

Line Testing

Connect a test telephone to each line; verify the presence of dial tone, and break dial tone by dialing a number.

The 30e allows DTMF tone dialing only – refer to the SYSTEM DESCRIPTION - Telco/PABX Requirements section.

Test any additional features ordered with the lines. Open circuit voltage must be approximately 48 volts.

Station Connections

Connect *T* and *R* on the 120 blocks to Tip and Ring of each station to be monitored. The 120 connects in parallel with the station sets.

Figure 7

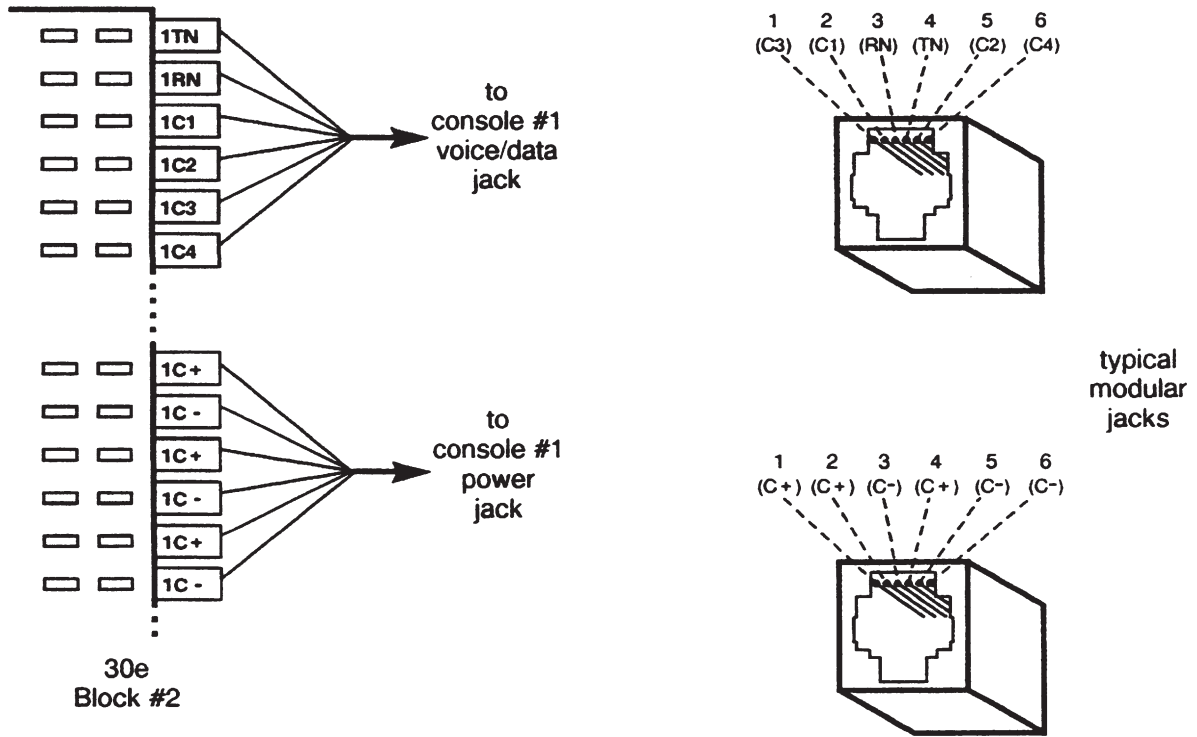## Console Cable Installation

30e Console Cables

Figure 8

Console Positions #1 and #2

Wall Jack Pinout	Wall Jack Typical Wire Color	Console #1 Designation (connector 1)	Console #2 Designation (connector 1)	Typical 3 Pair Console Cable Wire Color	(actual wire color)
1	WHT	1C3 (WHT-GRN)	2C3 (RED-BLU)	WHT-GRN	
2	BLK	1C1 (WHT-ORN)	2C1 (WHT-SLT)	WHT-ORN	
3	RED	1RN (BLU-WHT)	2RN (BRN-WHT)	BLU-WHT	
4	GRN	1TN (WHT-BLU)	2TN (WHT-BRN)	WHT-BLU	
5	YEL	1C2 (ORN-WHT)	2C2 (SLT-WHT)	ORN-WHT	
6	BLU	1C4 (GRN-WHT)	2C4 (BLU-RED)	GRN-WHT	

Table 8 – 30e Console "Voice/Data" Jack Pinout, Console Positions #1 and #2

Tone Commander 30e120 Installation Instructions

Wall Jack Pinout	Wall Jack Typical Wire Color	Console #1 Designation	Console #2 Designation	Typical 3 Pair Console Cable Wire Color	(actual wire color)
1	WHT	1C+ (YEL-BLU)	2C+ (YEL-SLT)	WHT-GRN	
2	BLK	1C+ (BLK-SLT)	2C+ (YEL-BRN)	WHT-ORN	
3	RED	1C- (BRN-BLK)	2C- (GRN-YEL)	BLU-WHT	
4	GRN	1C+ (BLK-BRN)	2C+ (YEL-GRN)	WHT-BLU	
5	YEL	1C- (SLY-BLK)	2C- (BRN-YEL)	ORN-WHT	
6	BLU	1C- (BLU-YEL)	2C- (SLT-YEL)	GRN-WHT	

Table 9 – **30e Console "Power" Jack Pinout, Console Positions #1 and #2**

All 30e console cables from positions #1 and #2 connect to 30e block #2. The total length of each console cable, including line cord and equipment room cross connects, must not exceed 500 feet.

CAUTION – Before connecting Voice/Data and Power, make sure that the CPU is powered down!

1. Install two 6 position, 6 contact modular telephone jacks within 6 feet of the console.
2. Label the jacks "30e voice/data" and "30e power".
3. Connect a 3 pair cable to each jack and run them to the equipment room.

   IMPORTANT – Whenever nonkey adapters are used in conjunction with existing multipair cable, verify that the adapters conform to Tables 8 and 9 above.
4. *Only if the colors of your cables differ from the typical colors*: fill out Tables 8 and 9 with the actual wire colors of the cables for each connection.
5. Punch down the "voice/data" cable to block #2 as listed in the Console #1 Designation column in Table 8.
6. Punch down the "power" cable to block #2 as listed in the Console #1 Designation column in Table 9.
7. If the system has two attendant positions, punch down the second console's cables to the pins listed in the Console #2 Designation columns of Tables 8 and 9.

Console Positions #3 and #4

Wall Jack Pinout	Wall Jack Typical Wire Color	Console #3 Designation	Console #4 Designation	Typical 3 Pair Console Cable Wire Color	(actual wire color)
1	WHT	3C3 (RED-BRN)	4C3 (BLK-ORN)	WHT-GRN	
2	BLK	3C1 (RED-GRN)	4C1 (BLK-BLU)	WHT-ORN	
3	RED	3RN (ORN-RED)	4RN (SLT-RED)	BLU-WHT	
4	GRN	3TN (RED-ORN)	4TN (RED-SLT)	WHT-BLU	
5	YEL	3C2 (GRN-RED)	4C2 (BLU-BLK)	ORN-WHT	
6	BLU	3C4 (BRN-RED)	4C4 (ORN-BLK)	GRN-WHT	

Table 10 – 30e Console "Voice/Data" Jack Pinout, Console Positions #3 and #4

Wall Jack Pinout	Wall Jack Typical Wire Color	Console #3 Designation	Console #4 Designation	Typical 3 Pair Console Cable Wire Color	(actual wire color)
1	WHT	3C+ (WHT-GRN)	4C+ (RED-GRN)	WHT-GRN	
2	BLK	3C+ (WHT-ORN)	4C+ (RED-ORN)	WHT-ORN	
3	RED	3C- (BLU-WHT)	4C- (BLU-RED)	BLU-WHT	
4	GRN	3C+ (WHT-BLU)	4C+ (RED-BLU)	WHT-BLU	
5	YEL	3C- (ORN-WHT)	4C- (ORN-RED)	ORN-WHT	
6	BLU	3C- (GRN-WHT)	4C- (GRN-RED)	GRN-WHT	

Table 11 – 30e Console "Power" Jack Pinout, Console Positions #3 and #4

A PSE-3 power supply is required for these consoles. Each supply can power three consoles, either 30e or 120 models. ***All PSE-3s must be powered from the same outlet box or power strip as the 30e and 120 CPUs.***

The "power" cables from 30e consoles at positions #3 and #4 must connect to the power supply block. The "voice/data" cables connect to 30e block #2.

The total length of each console cable, including line cord and equipment room cross connects, must not exceed 500 feet.

1. Install the jacks and cables in the same manner as those for positions #1 and #2.
2. Punch down the "voice/data" cables to block #2 as listed in Table 10.
3. Punch down the "power" cables to the PSE-3 block as listed in Table 11.

    NOTE – The colors listed in the Console Designation columns of Table 11 show the console at position #3 connected to power output #1, and console at position #4 connected to power output #2. This is just an example; any of the three power outputs may be used (refer to Table 7). **The PSE-3 contains three independent circuits. DO NOT connect them together – use a separate output for each console!**
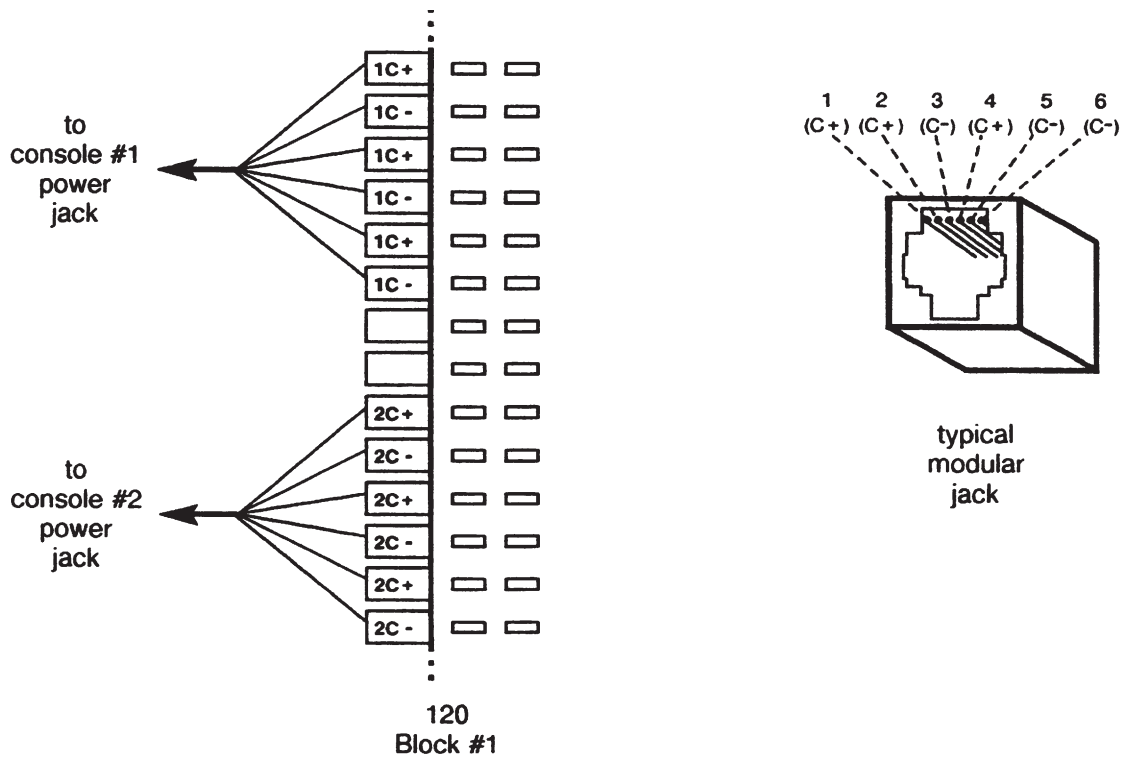
120 Console Cables

Figure 9

Console Positions #1 and #2

Wall Jack Pinout	Wall Jack Typical Wire Color	Console #1 Designation (connector 1)	Console #2 Designation (connector 1)	Typical 3 Pair Console Cable Wire Color	(actual wire color)
1	WHT	1C+ (YEL-BRN)	2C+ (VIO-GRN)	WHT-GRN	
2	BLK	1C+ (YEL-GRN)	2C+ (VIO-ORN)	WHT-ORN	
3	RED	1C- (ORN-YEL)	2C- (BLU-VIO)	BLU-WHT	
4	GRN	1C+ (YEL-ORN)	2C+ (VIO-BLU)	WHT-BLU	
5	YEL	1C- (GRN-YEL)	2C- (ORN-VIO)	ORN-WHT	
6	BLU	1C- (BRN-YEL)	2C- (GRN-VIO)	GRN-WHT	

Table 12– 120 Console "Power" Jack Pinout, Console Positions #1 and #2

The power cables from consoles #1 and #2 connect to 120 block #1. The total length of each console cable, including line cord and equipment room cross connects, must not exceed 500 feet.

1. Install a 6 position, 6 contact modular telephone jack within 6 feet of the console.

2. Label the jack "120 power".

3. Connect a 3 pair cable to the jack and run it to the equipment room.

   IMPORTANT – Whenever nonkey adapters are used in conjunction with existing multipair cable, verify that the adapters conform to Table 12 above.

4. *Only if the colors of your cables differ from the typical colors*: fill out Table 12 with the actual wire colors of the cable for each connection.

5. Punch down the cable to 120 block #1 as listed in the Console #1 Designation column in Table 12.

6. If the CPU has two attendant positions, punch down the second console's cable to the pins listed in the Console #2 Designation columns of Table 12.

Console Positions #3 and #4

Wall Jack Pinout	Wall Jack Typical Wire Color	Console #3 Designation	Console #4 Designation	Typical 3 Pair Console Cable Wire Color	(actual wire color)
1	WHT	3C+ (WHT-GRN)	4C+ (RED-GRN)	WHT-GRN	
2	BLK	3C+ (WHT-ORN)	4C+ (RED-ORN)	WHT-ORN	
3	RED	3C- (BLU-WHT)	4C- (BLU-RED)	BLU-WHT	
4	GRN	3C+ (WHT-BLU)	4C+ (RED-BLU)	WHT-BLU	
5	YEL	3C- (ORN-WHT)	4C- (ORN-RED)	ORN-WHT	
6	BLU	3C- (GRN-WHT)	4C- (GRN-RED)	GRN-WHT	

Table 13 – 120 Console "Power" Jack Pinout, Console Positions #3 and #4

A PSE-3 power supply is required for these consoles. Each supply can power three consoles, either 30e or 120 models.

The "power" cables from 120 consoles at attendant positions #3 and #4 connect to the power supply block.

The total length of each console cable, including line cord and equipment room cross connects, must not exceed 500 feet.

1. Install the jacks and cables in the same manner as those for console positions #1 and #2.

2. Punch down the "power" cables to the PSE-3 block as listed in Table 13.

   NOTE – The colors listed in the Console Designation columns of Table 13 show the console at position #3 connected to power output #1, and the console at position #4 connected to power output #2. This is just an example; any of the three power outputs may be used (refer to Table 7). **The PSE-3 contains three independent circuits. DO NOT connect them together – use a separate output for each console!**

Console Installation

Perform the steps in this section for each console position.
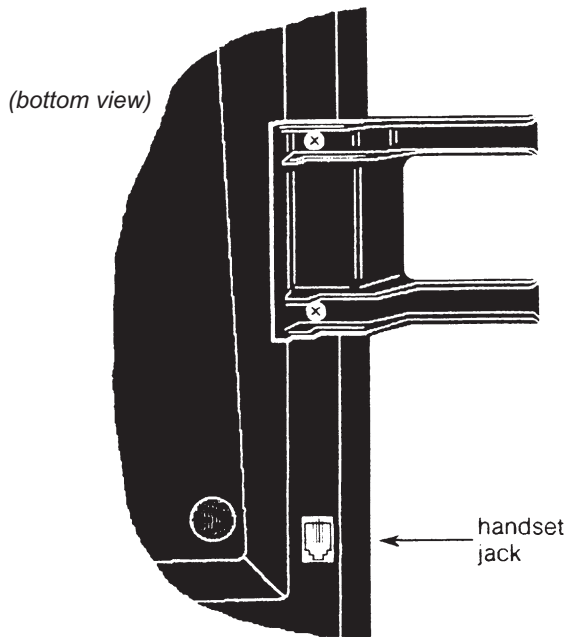
30e

(bottom view)

handset jack

Figure 10

1. Install the handset cradle on the 30e console using the screws provided. The cradle may be installed on either side of the console.

2. Plug the handset's cable into the jack beneath the front left edge of the console.

3. Fill out the keycap labels with line names or numbers (refer to the configuration sheets). Place the labels beneath the clear plastic key caps, then snap the keycaps onto the line keys.

120

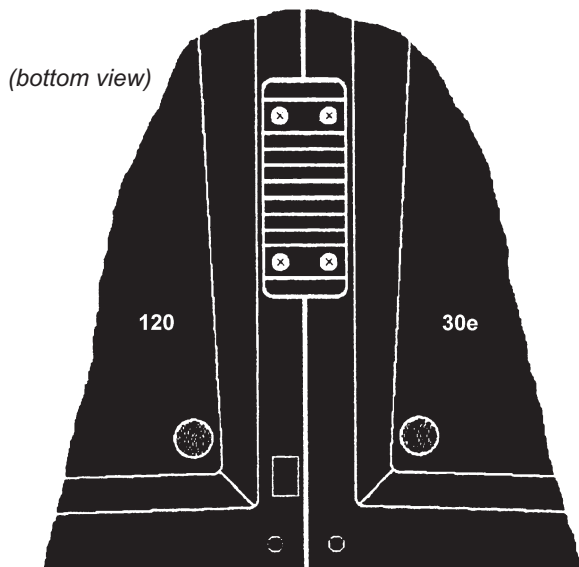

(bottom view)

120   30e

Figure 11

1. Fasten the console tie bracket beneath the left edge of the 120 console using the supplied mounting screws.

2. Fasten the other end of the tie bracket beneath the left edge of the 30e console using the supplied mounting screws.

3. If the attendant position has two 120 consoles (requires two CPUs), attach the second 120 console to the first in the same manner.

4. Fill out the keycap labels with station names or numbers (refer to the configuration sheets). Place the labels beneath the clear plastic key caps, then snap the keycaps onto the line keys.
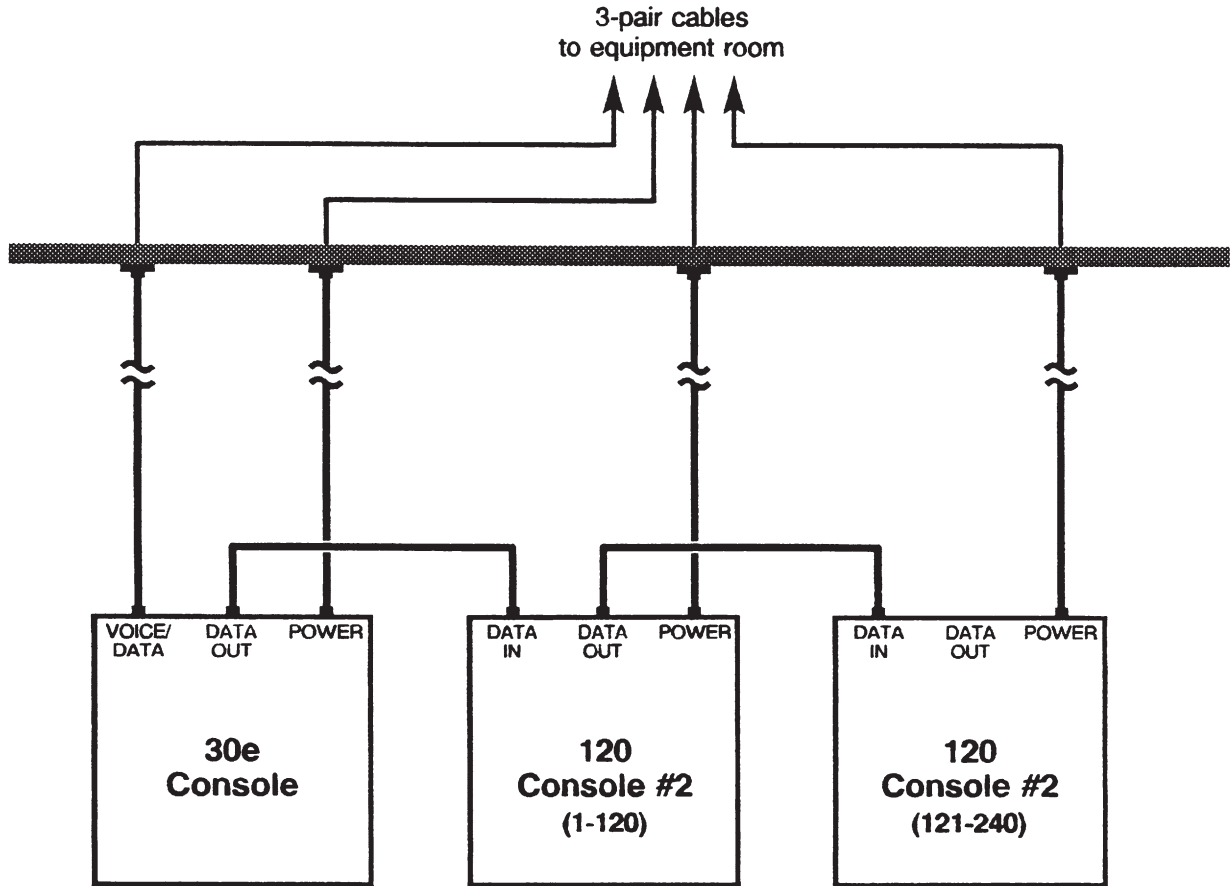
Console Line Cords

Figure 12

1. Plug one end of each supplied 6 conductor modular line cord into the "voice/data" and "power" jacks at the back of the 30e console.

2. Plug the line cords into their associated wall jacks, or into the test jacks located on the 30e CPU main circuit board (refer to Figure 1).

    CAUTION – **Do not interchange these two line cords!**

3. Plug the supplied short modular line cord into the "data out" jack on the 30e console, and into the "data in" jack on the first 120 console.

    Do not use a standard modular cord – *these data cords have the connections reversed on one plug.*

4. If the system has two 120 consoles at the attendant position (requires two 120 CPUs) – plug the other short modular line cord into the "data out" jack on the first 120 console, and into the "data in" jack on the second 120 console.

5. Plug one end of each supplied long 6 conductor modular line cord into the "power" jacks at the back of each 120 console.

6. Plug these cables into their associated wall jacks, or into the test jacks located on the 120 CPU main circuit board (refer to Figure 2).

    If a line cord (other than the short 120 data cord) must be replaced, be sure to use one with 6 conductors. Many line cords with 6 position plugs have only 4 conductors.

Preliminary Testing

At this time, you should have completed the following:

- Mounted the CPU and blocks
- Mounted the power supplies and blocks for console positions #3 and #4 (optional)
- Installed line and console expansion cards (optional)
- Installed the cables from the CPU to the blocks
- Installed the data link cable between 30e and 120 CPUs
- Connected telco reference ground to 30e and 120 blocks
- Connected Tip and Ring from each line to the 30e block
- Connected Tip and Ring from each monitored station to the 120 blocks
- Installed the console cables and jacks
- Assembled and connected the console(s)

It is a good idea to briefly test the operation of the 30e before proceeding with installation or programming.

1. Plug the CPU into a power outlet.

   A. The "heartbeat" indicator at the bottom of the CPU main circuit board should flash.

      If no "heartbeat" is present, check that the power outlet is "live". A blown fuse on the circuit board may indicate a defective CPU.

   B. The console should emit two triple beeps, then briefly display "30e OK".

   If these indications are not observed, check both voice/data and power cabling.

2. Repeat step 1 at attendant position #2, #3, and #4 if the system is so equipped.

C.O. Line Testing

Perform the following tests on each telco/PABX line. Repeat at attendant position #2, #3, and #4 if the system is so equipped.

Line Access and Imbalance Testing

1. Press the key representing the line to be tested.

   The associated line lamp (telephone symbol) should flicker while the line is accessed.

   NOTE – Open circuit voltage must be approximately 48 volts.

2. Listen for audible hum or excessive noise.

   PASS – Such noise or hum is not present.
   FAILURE – Such noise or hum is present.

3. Listen for dial tone.

   PASS – Dial tone is heard.
   FAILURE – Dial tone is not heard.

4. Break dial tone by dialing a digit.

   PASS - *Dial tone is broken and no audible hum or excessive noise is heard.*
   FAILURE - *Dial tone cannot be broken; audible hum or excessive noise is heard.*

5. Press the RELEASE key.

   IMPORTANT – Upon the detection of any failure during the foregoing testing, disconnect the affected equipment from the telephone line to determine if such equipment is the cause of failure. Any equipment determined to be malfunctioning must remain disconnected, and use discontinued until the malfunction has been corrected.

Hold and Autohold Testing

1. Access the line to be tested and establish call to another station.

2. Place the call on hold by depressing the red HOLD key.

   The associated **H** indicator will wink slowly.

3. Reseize the call by depressing the line key.

   The associated **H** indicator goes out.
   The line lamp flickers while the line is accessed.

4. Place the call on autohold by depressing another idle line key.

   The line accessed draws dial tone.
   The line under test goes to autohold.

5. Release the line drawing dial tone and reseize, then release the line under test.

Ring Trip and Imbalance Testing

1. Dial the number of the line to be tested from another station.

   The associated line lamp will flash slowly.

      or

   The associated line lamp will flash quickly, if the line has been optioned for ring delay.

2. Press the line key to answer the call.

   The line lamp changes from flashing to flickering.

3. Listen for audible hum or excessive noise.

   PASS – Such noise or hum is not present.
   FAILURE – Such noise or hum is present.

   IMPORTANT – Upon detection of audible hum or excessive noise, disconnect the affected equipment to determine if such equipment is the cause of failure. Any equipment determined to be malfunctioning must remain disconnected, and use discontinued until the malfunction has been corrected.

4. Press the RELEASE key.

30e CPU Option Switches
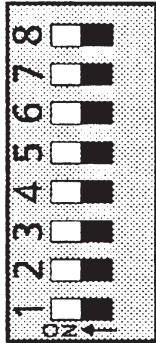
SWITCH	FUNCTION
1	OFF – Autodial Program unlocked ON – Autodial Program locked
2	OFF – Configuration Program unlocked ON – Configuration Program locked
3	OFF – Name Program unlocked ON – Name Program locked
4	OFF – night transfer ON – night ringing
5	*must be OFF!*
6, 7	*not used*
8	OFF – retain new programming ON – restore defaults (when power is cycled off & on)

Table 14 – CPU Option Switches

Switches on the CPU control system programming and Night Service options. The switches are ON when set towards the left side of the CPU. When a programming option is "locked", programming changes are not allowed. The switch location is shown on page 15.

Optional Equipment Installation

The following options require system programming for proper operation. Refer to the Configuration Programming section.

Night Service

The 30e console may either switch the telephone system to night transfer, or ring a night bell during incoming ringing when the attendant selects Night Service mode. Only one of these options may be installed.

Option switch #4 on the 30e CPU selects the Night Service mode. Set this switch *OFF* for night transfer, or *ON* for night ringing.

Night Ringing

Night ringing is switched on and off during ringing of either lines only, or lines and stations. One of these options must be selected during configuration programming.

Tone Commander's PA-24 Paging/Chime Module provides a chime tone that can announce ringing calls over a paging system. This unit is powered from the 30e or 120 CPU. Refer to the PA-24 Paging/Chime Module Installation Instructions, doc. #13-102595.

An external bell may be used in place of ringing over a paging system, as shown below.
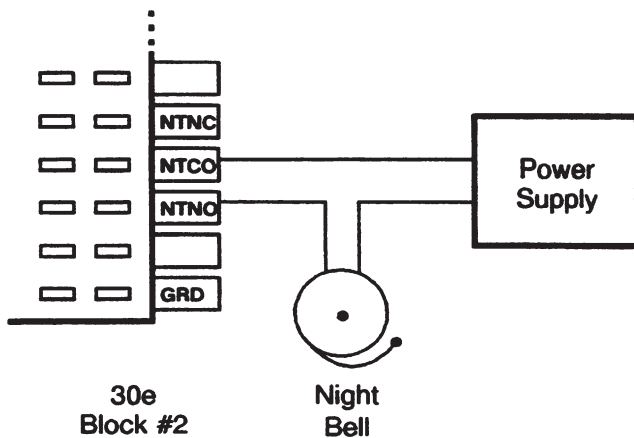
1. Install the night bell in the location desired by the customer.
2. Run a two conductor cable from the night bell to the equipment room.
3. Connect the cable to the bell.
4. Mount a suitable bell power supply in the equipment room.
5. Connect one output terminal of the power supply to *NTCO* (common) on the right side of 30e block #2.
6. Connect one wire in the bell cable to the other output terminal of the power supply.
7. Connect the remaining wire in the bell cable to *NTNO* (normally open).

Figure 13

Night Transfer

The night transfer leads from the telephone system remain connected together when the console is in Night Service mode, and during a power interruption at the 30e CPU.
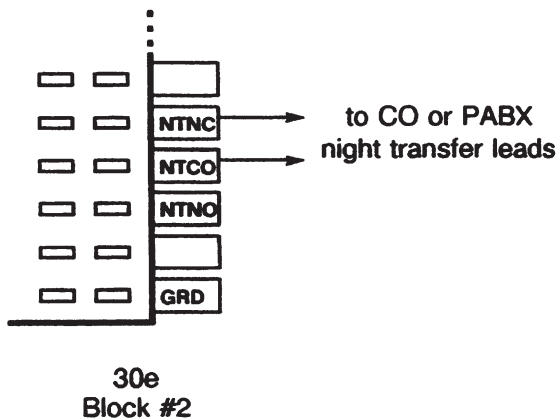
Connect *NTCO* (common) and *NTNC* (normally closed) on the right side of CPU block #1 to the night control terminals on the telco/PABX block.

Figure 14

Music On Hold

An external music source is required for Music On Hold. It will be assigned to the lines during configuration programming. The music input may be connected to any type of compatible music source (refer to the Specifications section).

The music source can be connected to the jack provided on the 30e CPU, or punched down to the block.

Jack Connections
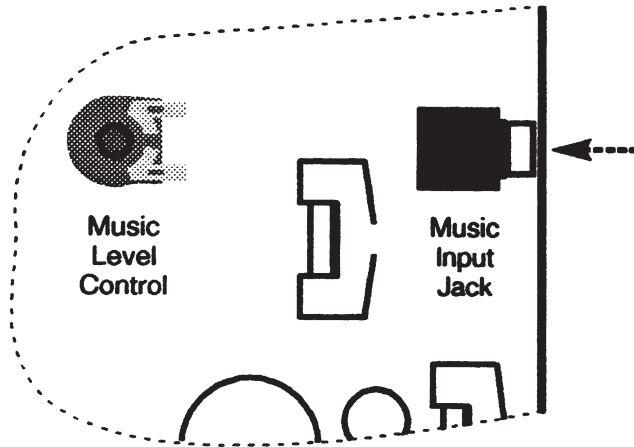
1. Connect an RCA-type phono plug to one end of a single conductor shielded cable, or obtain a cable with a plug attached. The center conductor connects to the pin of the plug.

2. Plug the cable into the music input jack at the top of the 30e CPU.

3. Connect the other end of the cable to the output of the music source. A plug to fit the music source may be required.

Figure 15

Block Connections
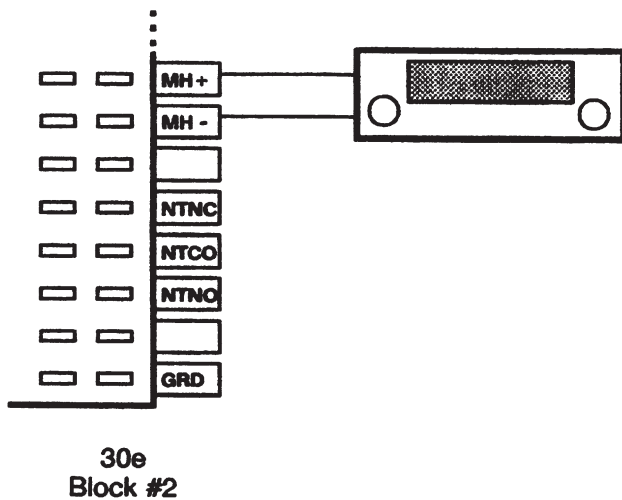
1. Connect a twisted wire pair to *MH+* and *MH-* on the right side of 30e block #2.

2. Connect the other end of the wire pair to the output of the music source. A plug to fit the music source may be required.

Figure 16

Paging

Tone Commander's PA-24 Paging/Chime module interfaces the 30e console to a paging system. The module includes a night ringing chime and switching for background music control. Power is derived from the 30e or 120 CPU.

Paging can be connected to any spare line key on the 30e. Refer to the PA-24 Paging/Chime Module Installation Instructions, doc. #13-102595.

Voice Mail

Each station with an associated voice mail box should be call forwarded on no answer to the voice mail system. The DSS dial string for these stations must include the R (Ringback Detect) option, as described on page 65.

If Call Forward-No Answer is not available, program a spare DSS key with the voice mail access number. Call transfer to voice mail is handled manually in the same manner as transfer to a station.

Configuration Programming

Various network interface and operation parameters are programmable by the installer, allowing compatibility with a wide variety of central offices and PABXs. The system is pre-programmed at the factory; many installations will require few changes to these values. Programming is retained in the CPU's memory when power is disconnected. When option switch #8 on the 30e CPU is *OFF*, programming is retained in the 30e CPU's memory when power is disconnected.

The programmable parameters are described on the following pages in the order listed below. A parameter or feature may be altered at any time without reprogramming the entire system.

The following features may be set from configuration programming mode by pressing the appropriate line key. The letters are printed on the console front panel beneath the line keys. Key numbers in parentheses correspond to line numbers on the punchdown blocks.

1. **System-wide Features**

Line Key	Feature			
A (26)	Abandoned Ring Time	I (24)	Hold Release Time
B (27)	Recall Rings	J (25)	Park Recall Time
C (28)	Pickup Code Sequence	K (16)	Night Bell Mode
D (29)	Dialing Speed	* L (17)	Queue Priority
E (30)	Pause Time	M (18)	Alert Type
F (21)	Hookflash Time	* N (19)	Ringing Type
G (22)	Dial Tone Detect Time	* O (20)	Camp-on
H (23)	Hold Recall Time	P (11)	Statistics Recording

2. **Special Feature Key Assignment**

   S (14) Assign Page Key
   U (6)   Assign Night Key
   * V (7) Assign Quick Mode Key
   * W (8) Assign Override Key
   * X (9) Assign Call Park Key

3. **Features Selectable By Line**

   * Q (12) Line Privacy
   * R (13) Answer Use

After configuration programming is completed, program the following items as described in subsequent sections of this manual.

4. **DSS/Autodial Numbers**   * 6. **Ring Delays**

5. **Name Displays**   7. **Time of Day Clock**

   * Features marked with an asterisk have separate settings for each console position in a two-position system. They must be programmed individually at each console.

Using Configuration Programming Mode

The configuration programming mode must be entered prior to attempting any of the following programming procedures. *Enter this mode only when the console is idle, i.e., no calls are in progress or on hold and the time of day is displayed.*

The Configuration Program Lock Switch (switch #2) inside the 30e CPU must be OFF *(unlocked) before proceeding (see pages 15 and 36).*

To **enter** configuration programming mode:

- Press HOLD.
- Press TRANSFER.
- Press RELEASE.
- Press dial pad key **C** (2).
    The display will indicate that configuration programming mode has been entered.

To **exit** configuration programming mode and store all programming:

- Press RELEASE.

    or

    The mode will be exited automatically 1 minute after the last keypress.

When completed, set the Configuration Program Lock Switch inside the 30e CPU to ON *(locked) to prevent inadvertent changes to the programmed settings.*

Line keys on the 30e console are used to select the feature to be programmed – letters identifying the keys are printed beneath the keys on the console's front panel.

Default Settings

The default settings, as shipped from the factory, are listed with each feature on the following pages.

Default settings may be recalled by setting 30e CPU option switch #8 to *ON*, then cycling the CPU power off and on (pull out the power plug for a few seconds)*. Set this switch back to OFF to prevent losing your programming during a power outage*.

The switch location is shown on pages 15 and 36.

Confirmation and Error Tones

The speaker in the console signals correct or incorrect actions during programming. The console's volume control adjusts the level of the tones – use the VOL keys above the dial pad.

Confirmation Tone – double beep   Error Tone – single beep

Help Displays

The console display shows current settings during programming, and displays help information. Displays longer than 20 characters will automatically scroll to the left after a brief pause.

Help with selecting a feature to be programmed is available by pressing TRANSFER. Help will be displayed continuously until either a feature is selected, configuration programming mode is exited by pressing RELEASE, or the help display is restarted by pressing TRANSFER again.

After selecting a feature with a line key, help with programming that feature can be displayed by pressing the line key again. The console will return to programming value selection following the help display.
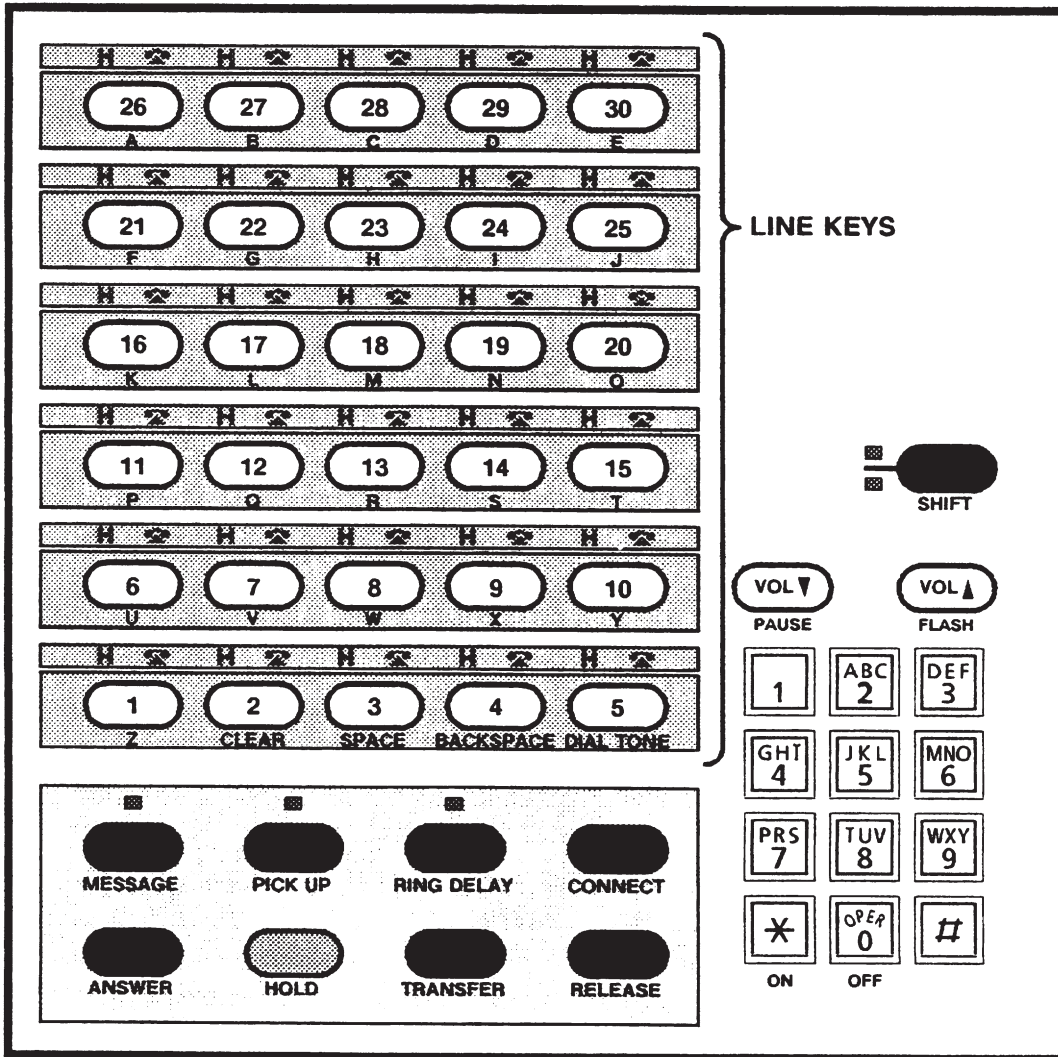
Figure 17 – **30e Console Keys**
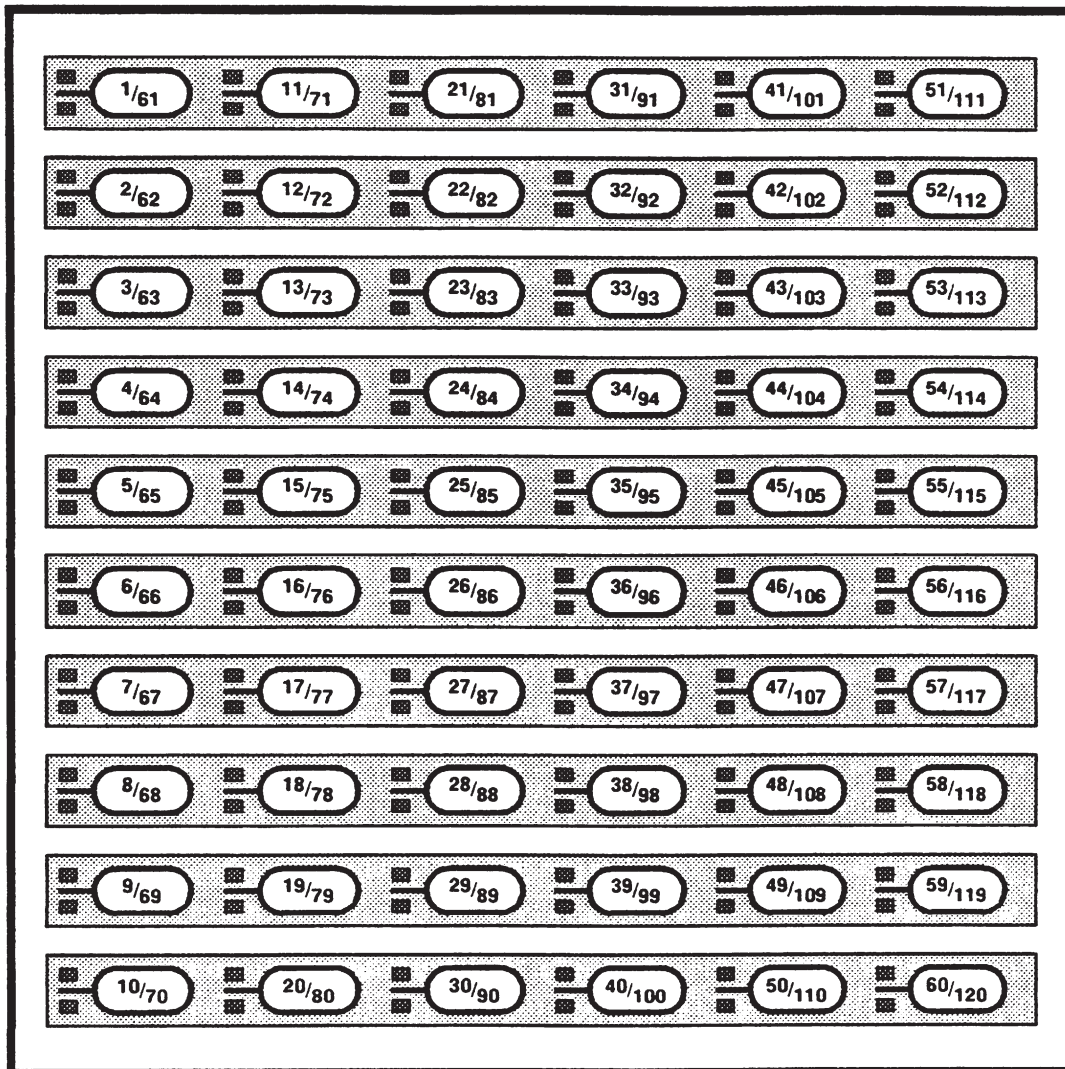
Figure 18 – 120 Console (#1) Keys
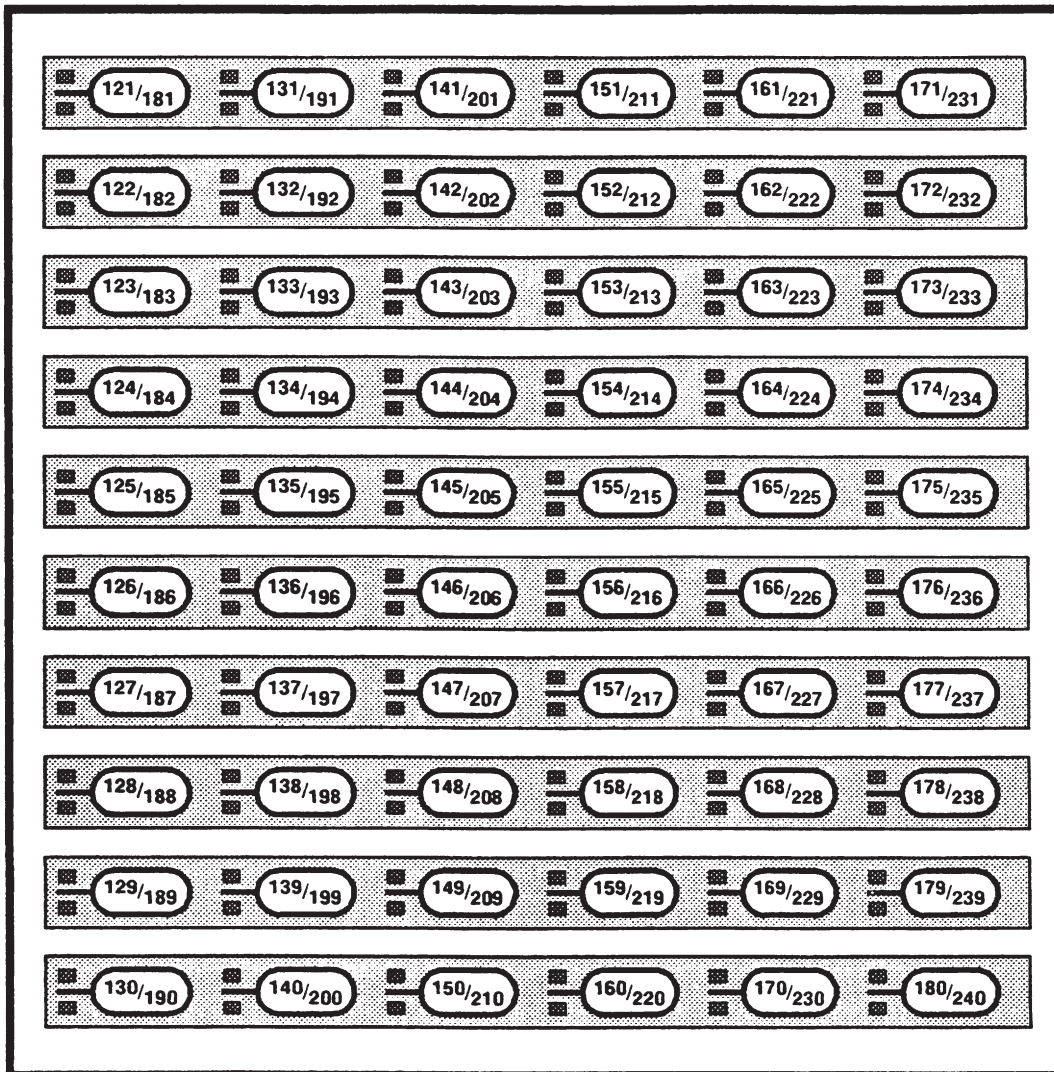
Figure 19 – **120 Console (#2) Keys**

Programming System-Wide Features

Timing Parameters and Night Service Mode

- Press HOLD, then TRANSFER, then RELEASE, then **C** (2) on the dial pad to enter configuration programming mode.

    "CONFIGURE PROG" will be displayed.

- Press a line key to select the feature to be programmed.

    The display will show the item name and the current value.
    The station status lamp will light steadily.

- Press a key on the dial pad if you want to change the value.

    The new value will be shown in the display. Changes are stored immediately.

- Press a DSS key to select another feature.

    or

    Press RELEASE to exit configuration programming mode (the mode will be exited automatically 1 minute after the last keypress).

NOTE – Systems with two or more attendant console positions have separate Queue Priority, Ringing Type, and Camp-On settings for each console. They must be programmed individually at each console position.

For example, to set Hold Recall Time to 50 seconds:
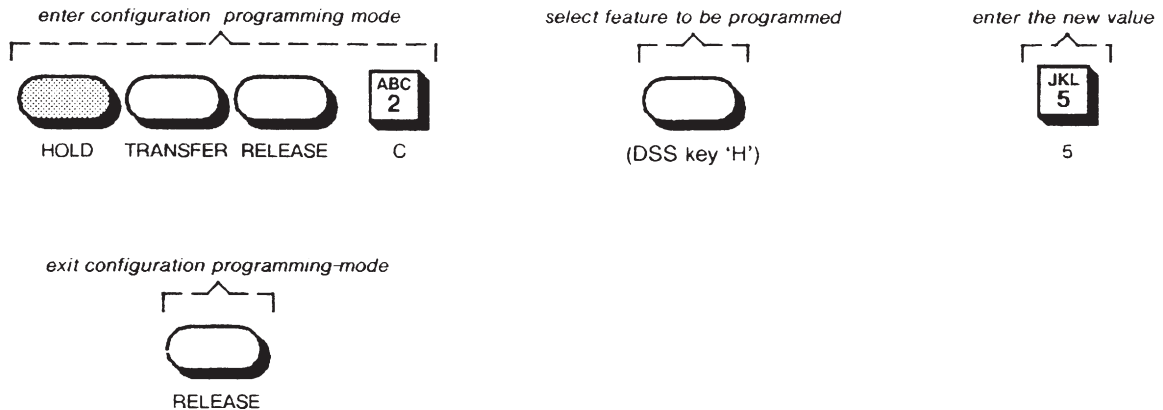
Figure 20

Tone Commander 30e120 Installation Instructions

Timing values listed in the following tables are nominal, and may differ slightly from the actual values. Shaded values are factory defaults.

Abandoned Ring Time

Dial Pad Key	Available Values
2	2 sec
3	3 sec
4	4 sec
5	5 sec
6	6 sec
7	7 sec
8	8 sec
9	9 sec
0	10 sec

Table 15

Line key to select feature: **A**

Default value: **5 sec**

This parameter determines the timing for discontinuing ringing of unanswered incoming calls that were abandoned by the caller. It should be set to the next time value longer than the silent interval between ringing bursts.

if too short – each ring burst may be seen as a new call. This can cause erratic line lamp rates and loss of ringing delays.

if too long – abandoned calls will continue to ring for the duration of this timing value.

Recall Rings
(with 120 console only)

Dial Pad Key	Available Values
1	1 ring
2	2 rings
3	3 rings
4	4 rings
5	5 rings
6	6 rings
7	7 rings
8	8 rings
9	9 rings
0	no recall

Table 16

Line key to select feature: **B**

Default value: **3 rings**

This sets the number of rings before a call transferred to an idle station recalls the console.

Set this parameter according to customer preference.

Pickup Code Sequence
(with 120 console only)

Dial Pad Key	Available Values
0	first (before station #)
1	last (after station #)

Table 17

Line key to select feature: *C*

Default value: *first*

This parameter determines when the console inserts the Directed Call Pickup code during a station call pickup dialing sequence, as required by the telephone system.

Almost all installations require the pickup code to be *first*.

Dialing Speed

Dial Pad Key	Available Values
6	slow (6 digits/sec)
0	fast (10 digits/sec)

Table 18

Line key to select feature: *D*

Default value: *fast*

The tone autodialing speed (via DSS key) is set with this parameter.

Use the dialing speed compatible with the central office or PABX. If misdialing occurs with the fast speed, switch to slow speed.

Manual dialing speed is also affected. When *fast* speed is selected, manually dialed digits follow dial pad keystrokes. With *slow* speed selected, digits are buffered and sent with a tone on period of 80 ms, and 80 ms between digits. This guarantees minimum tone periods for slow central offices.

Pause Time
(with 120 console only)

Dial Pad Key	Available Values
2	200 ms
3	300 ms
4	400 ms
5	500 ms
6	600 ms
7	700 ms
8	800 ms
9	900 ms

Table 19

Line key to select feature: *E*

Default value: *700 ms*

This sets the length of a "pause" in an autodial sequence.

Pauses are typically used to insert a delay in a dialing string when calling voice mail or similar equipment. Change this parameter if a delay other than a multiple of 700 ms is required.

For example, for a dialing delay of 2 seconds, set the pause time to 500 ms and insert 4 pauses in the autodial sequence.

Tone Commander 30e120 Installation Instructions

Hookflash Time

Dial Pad Key	Available Values
5	500 ms
6	600 ms
7	700 ms
8	800 ms
9	900 ms
0	1 sec

Table 20

Line key to select feature: **F**

Default value: **600 ms**

This parameter sets the length of a timed hookflash generated during call transfer and autodial operations. The default value is adequate for most systems.

if too short – receipt of second dial tone may be intermittent during call transfer operations.

if too long – the calling party may be disconnected during call transfer operations.

Dial Tone Detect Time
(with 120 console only)

Dial Pad Key	Available Values
1	500 ms
2	600 ms
3	700 ms
4	1 sec
5	1.2 sec
6	1.5 sec
7	1.8 sec
8	2 sec

Table 21

Line key to select feature: **G**

Default value: **700 ms**

This sets the time steady dial tone must be present before station digits are autodialed.

Set this parameter to the lowest value that gives reliable dial tone detection.

Hold Recall Time

Dial Pad Key	Available Values
3	30 sec
4	40 sec
5	50 sec
6	60 sec
9	90 sec
1	2 min
2	3 min
0	no recall

Table 22

Line key to select feature: *H*

Default value: *90 sec*

Calls on console hold or camp-on longer than the Hold Recall Time will recall the console.

Set this parameter according to customer preference.

NOTE – Calls on hold at the telephone system (initiated by a hookflash) will not recall the console.

Hold Release Time

Dial Pad Key	Available Values
1	40 ms
2	80 ms
3	200 ms
4	400 ms
5	600 ms
6	800 ms
7	1 sec
8	2 sec

Table 23

Line key to select feature: *I*

Default value: *600 ms*

A central office disconnect supervision signal (i.e., brief battery removal) on any line must exceed this value. When such a signal from a line on hold is detected, the line will be automatically released.

Set this parameter to a value slightly less than the length of a disconnect signal from the central office.

if too short – may cause calls on hold to be inadvertently disconnected.

if too long – may cause abandoned calls and retrieved parked calls to remain connected to the console.

Tone Commander 30e120 Installation Instructions

Park Recall Time
(with 120 console only)

Dial Pad Key	Available Values
3	30 sec
4	40 sec
5	50 sec
6	60 sec
9	90 sec
1	2 min
2	3 min

Table 24

Line key to select feature: *J*

Default value: *90 sec*

Parked calls that are not retrieved before the time specified in this parameter will recall the console.

Set this parameter according to customer preference.

Night Bell Mode

Dial Pad Key	Available Values
1	lines only
2	lines + stations

Table 25

Line key to select feature: *K*

Default value: *lines only*

The optional night bell can be set to ring only when an incoming line rings (option 1), or when either an incoming line or station rings (option 2). Night ringing must be selected with CPU option switch #4 – see the Optional Equipment Installation section.

This option does not affect the operation of night transfer.

Set this parameter according to customer preference.

Queue Priority

Dial Pad Key	Available Values
1	stations only
2	stations, then lines
3	lines, then stations
4	FIFO

Table 26

Line key to select feature: **L** *(per console)*

Default value: **FIFO**

Calls are queued for attendant processing in the order received. The first call in queue is shown in the display.

Queue Priority determines which type of calls have priority in the queue:

(1) stations only
(2) lines+stations, stations have priority
(3) lines+stations, lines have priority
(4) lines+stations, first calls have priority
(FIFO, First In - First Out)

Set this parameter according to customer preference. *FIFO* is recommended for most installations.

NOTE – The call queue is cleared whenever Queue Priority is changed.

Alert Type
(with 120 consoles only)

Dial Pad Key	Available Values
1	normal ringing
2	distinctive ringing
0	both

Table 27

Line key to select feature: **M**

Default value: **both**

The 120 console alerts the attendant to all ringing station calls (after any programmed ring delays) when this parameter is set to *both*.

To ignore station-to-station calls, equip the station lines with distinctive ringing from the C.O. Set the Alert Type to *distinctive* if distinctive ringing is provided for outside calls, or to *normal* if distinctive ringing is provided for station-to-station calls.

Ringing Type
(with 120 consoles only)

Dial Pad Key	Available Values
1	long
0	short

Table 28

Line key to select feature: **N** *(per console)*

Default value: **short**

This parameter determines the type of audible ringing: short (1 beep), or long (3 beeps), when unanswered station calls are showing in the display.

Set this parameter according to customer preference.

Camp-on
(with 120 consoles only)

Dial Pad Key	Available Values
0	off
*	on

Table 29

Line key to select feature: **O** *(per console)*

Default value: ***off***

This parameter determines whether a call can be camped on to a busy station.

Set this parameter according to customer preference.

Statistics Recording

Dial Pad Key	Available Values
0	off
*	on

Table 30

Line key to select feature: **P**

Default value: ***on***

This parameter enables/disables the console usage statistics recording feature.

Special Feature Key Assignment

Spare line keys may be programmed to activate special features. Such usage precludes the connection of lines to these positions. Be sure to identify the keys with the supplied key cap labels.

- Press HOLD, then TRANSFER, then RELEASE, then **C** (2) on the dial pad to enter configuration programming mode.

    "CONFIGURE PROG" will be displayed.

- Press the line key to select the feature to be programmed:

    S – Page key

    U – Night key

    V – Quick Mode key

    W – Override key (required for manually overriding a "BUSY" or "CMP" display when transferring a call to a busy call-forwarded station via DSS key)

    X – Call Park key (required for parking calls)

The display will show the feature name.
The hold lamp above the key will light steadily.

- Press SHIFT to display the key that is set to activate the desired feature.

    The lower lamp next to the SHIFT key will light steadily.
    The line lamp (phone symbol) above a line key will be on if the key has the feature assigned to it.

- Press the line key that will be assigned the feature. Any spare line key (a key with no Tip and Ring connections on the block) may be used.

    The line lamp above the selected key will light steadily. Any feature assignment for the key will be overwritten.

    The previously assigned key will be cleared (reassigned as a standard line key); its line lamp will turn off.

        or

    Press the currently assigned key to clear its programming and reassign it as a standard line key, if no keys are to be assigned the selected feature.

    The line lamp above the selected key will turn off.

    NOTE – Perform a line test (at all consoles, if applicable) if a key has been reassigned as a standard line key – refer to the Preliminary Testing section in this document.

- Press SHIFT to store the new setting and return to feature selection.

    The upper lamp next to the SHIFT key will light steadily.

- Press a line key to select another feature.

    or

    Press RELEASE to exit configuration programming mode (the mode will be exited automatically 1 minute after last keypress).

    NOTE – In systems with two or more attendant console positions, the Override and Call Park keys must be programmed individually at each console position. Quick Mode is not recommended for multiple console installations.

When programmed at any console, the Page and Night keys appear in the same positions on all consoles.

Programming Features Selectable Per Line

The following programmable features do not apply to line keys that have been programmed for Page, Night Service, Quick Mode, Override, or Call Park.

- Press HOLD, then TRANSFER, then RELEASE, then **C** (2) on the dial pad to enter configuration programming mode.

  "CONFIGURE PROG" will be displayed.

- Press a line key Q for Line Privacy or R for Answer Use.

  The display will show the item name.
  The hold lamp above the key will light steadily.

- Press SHIFT to enter the feature check/set mode.

  The lower lamp next to the SHIFT key will light steadily.

- Press a line key to check the current feature setting.

  The display will show the line number and the current setting (OFF or ON).
  The line lamp (phone symbol) above the line key will light steadily.

- Press ON (*) or OFF (0) on the dial pad if you want to change the feature setting for this line.

  The line number and the new setting will be shown in the display. Changes are stored immediately.

- Press another line key to display its current feature setting.

  or

  Press SHIFT to return to feature selection.

  or

  Press RELEASE to exit configuration programming mode (the mode will be exited automatically 1 minute after the last keypress, except during feature selection help displays).

  NOTE – Systems with two or more attendant console positions have separate Line Privacy and Answer Use settings for each position. They must be programmed individually at each console position.

Line Privacy

DSS key to select feature: ***Q*** *(per console)*

Default Value for each line: ***off***

A line with the privacy option on cannot be accessed by the console when its line lamp indicates a "busy" condition.

Answer Use

DSS key to select feature: ***R*** *(per console)*

Default Value for each line: ***off***

Idle lines in this group will automatically be seized in descending order whenever the ANSWER key is used to pick up station calls.

CAUTION – Lines assigned to this group ***must*** be optioned for Directed Call Pickup, NonBarge-In.

Dedicated nonhunting lines are recommended for this usage. If this is not feasible, assign only the last lines in a terminal hunt group.

DSS/Autodial Number Programming

Each DSS key on the 120 console may be programmed to autodial up to 24 digits or functions, including 0-9, *, #, dial tone detect, ringback detect, busy override, a hookflash (transfer signal), and a pause. The PICK UP key autodials the call pickup code; it must be also programmed with the required digits.

Digits are entered with the dial pad. The VOL keys are used to enter the pause and flash functions – these functions are printed below the keys on the console front panel.

> DIAL TONE delays dialing until steady dial tone is present. *If the telephone system does not send dial tone after receiving a flash, use two PAUSEs in place of DIAL TONE detect.*

> FLASH is used to transfer calls or access special features of the telephone system.

> PAUSE is used if a delay is required during dialing, for example to access a voice mailbox.

Pause, flash, and detect times can be changed from the 30e configuration programming mode.

IMPORTANT – The first entry of a dialing routine for any key to be used for DSS operation **must** be a FLASH (F). This entry will determine whether associated features with DSS operation will apply (Station Recall, Line Release w/Supervision, Station Camp-On, etc.).

> Example: *FD4710*

> Dialing routines, where the first entry is **not** a FLASH, will operate as Autodialing keys.

> Example: *D9D5551982*

Automatic Transfer Options

Two options are available to allow automatic transfer of calls to busy call-forwarded stations. These options are enabled by adding an **O** (Busy Override) or **R** (Ringback Detect) suffix to the DSS dialing string of the forwarded station.

Add the **O** suffix for: 1) stations programmed for Call Forward-Busy, with a courtesy ring provided by the central office or PABX

                              2) the lead number in a hunting group

> This option automatically overrides the console's display of "BUSY" or "CMP" when transferring a call to a busy station via DSS key. It can be invoked on a per-call basis for stations without the **O** suffix by using the OVERRIDE key.

Add the **R** suffix for: 1) stations that are not monitored by the 120 CPU, such as off-premise stations

                              2) stations programmed for Call Forward-All or Call Forward-Busy, with no courtesy ring provided by the central office or PABX

                              3) voice mail access line that is not monitored by the 120 CPU

> This option adds calling line ringback detection to the Line Release w/Supervision feature.

Press line key 20 for **O**, and line key 13 for **R** – the letters are printed beneath the keys.

> Example: *FD5327R*

Programming Procedure

Set the Autodial Program Lock Switch (switch #1) inside the **30e** *CPU to* **OFF** *(unlocked) before proceeding – see pages 15 and 36.*

- Press HOLD, then TRANSFER, then RELEASE, then **P** (7) on the dial pad to enter autodial programming mode.

    "PROGRAM AUTODIAL" will be displayed.

- Press the DSS key to be programmed. Press SHIFT first if selecting the station on the lower half of the key.

    The station status lamp will light.
    The display will show the number currently programmed, or "NOT PROGRAMMED".

- If you do not wish to change the currently programmed number, press HOLD, then select another DSS key.

- Using the dial pad and the PAUSE, FLASH, and DIAL TONE keys, enter the sequence to be dialed.

    The display will show the number being entered.

- Press HOLD to store the number, then select another DSS key to be programmed.

    or

    Press RELEASE to store the number and exit autodial programming mode (the mode will be exited automatically 1 minute after the last keypress, *without* storing the number).

When completed, set the Autodial Program Lock Switch inside the 30e CPU to **ON** *(locked) to prevent inadvertent changes to autodial programming.*

NOTE – Systems with two or more attendant console positions have a single set of DSS/autodial numbers shared by all positions. The numbers may be programmed at any console position.

For example, to program a DSS key to dial a hookflash, wait for dial tone, then dial station **5314**:
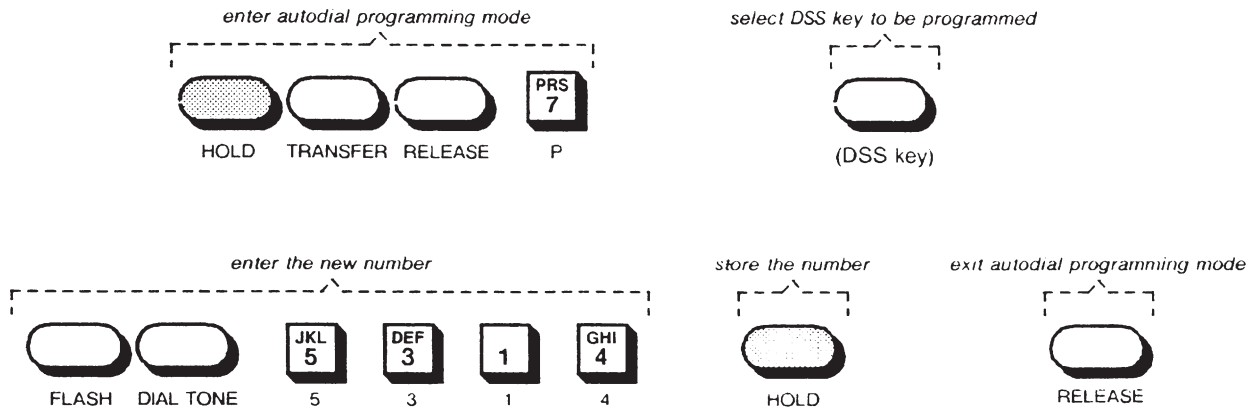
Figure 21

Pick Up Key Programming

The PICK UP key programming procedure is similar to that for DSS keys. Press PICK UP instead of selecting a DSS key, then proceed as illustrated below. Consult the telco for the required pickup code.

IMPORTANT – A DIAL TONE detect must be entered before the Directed Call Pickup code to ensure that steady dial tone is received before dialing begins. This may not apply to the few telephone systems which require the Directed Call Pickup code to be dialed *after* the station number. **DO NOT precede the pickup code with a FLASH**.

For example, to program the PICK UP key with the code *7:
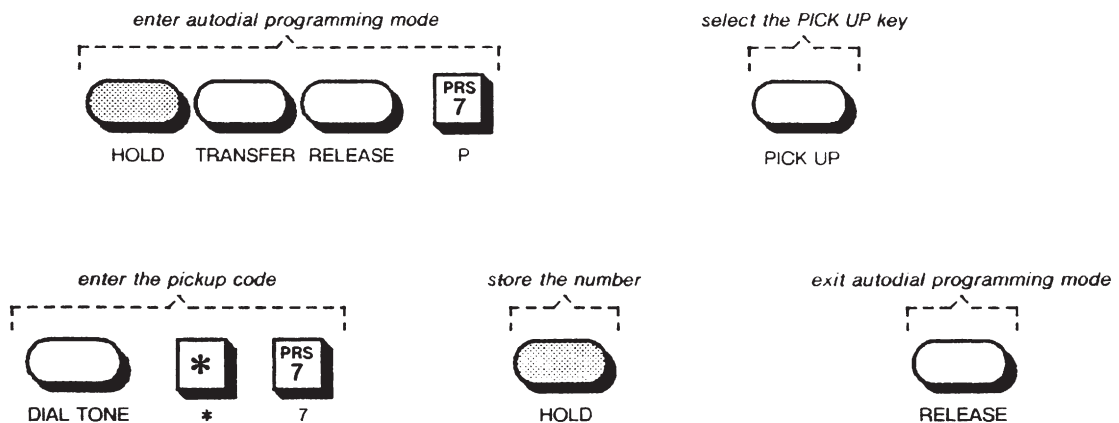
Figure 22

Name Display Programming

Any DSS/Autodial key to be programmed with a name display must already be programmed for autodialing; autodial programming may be changed without reprogramming the DSS name display. This restriction does not apply to line keys, since they cannot be programmed for autodialing.

Set the Name Program Lock Switch (switch #3) inside the 30e CPU to OFF *(unlocked) before proceeding – see pages 15 and 36.*

- Press HOLD, then TRANSFER, then RELEASE, then **N** (6) on the dial pad to enter name programming mode.

  "NAME ASSIGN" will be displayed, followed by a help display.

- Press the line or DSS key to be programmed. Press SHIFT first if selecting the station on the lower half of a DSS key.

  The lamp next to the selected key will light steadily.
  The name will be displayed if the selected key is currently programmed. Press CLEAR to allow reprogramming, or use BACKSPACE to edit the currently programmed name.

- If you do not wish to change the currently programmed name, press HOLD, then select another line or DSS key.

- Enter the name using the line keys on the 30e console. Letters are printed on the console front panel beneath the keys. Do not exceed 14 characters, including spaces. BACKSPACE will delete the last character entered.

- Press HOLD to store the new name.

- Select another DSS or line key to be programmed.

  or

  Press RELEASE to exit name identification programming mode (the mode will be exited automatically 1 minute after the last keypress).

When completed, set the Name Program Lock Switch inside the CPU to **ON** *(locked) to prevent inadvertent changes to name programming.*

NOTE – Systems with two or more attendant console positions have a single set of DSS/autodial name displays shared by all positions. The names may be programmed at any console position.

For example, to program the name "Smith" to be displayed when station #11 is ringing:

enter name programming mode

HOLD   TRANSFER RELEASE   N

select DSS key to be programmed

(DSS key #11)

enter the new name

S   M   I   T   H

(DSS keys)

store the name

HOLD

exit name programming mode

RELEASE
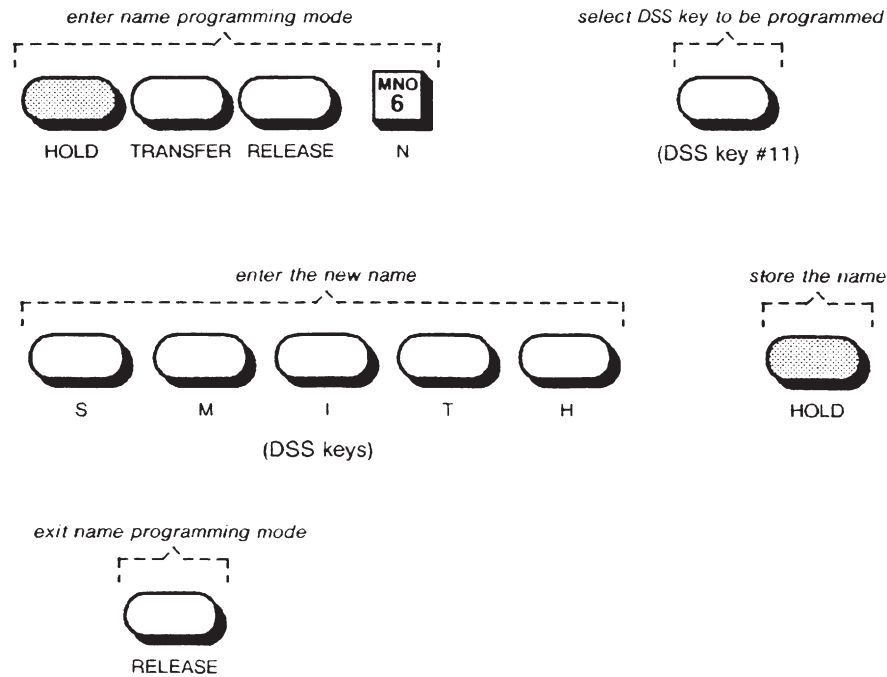
Figure 23

Ring Delay Programming

Checking Ring Delays

- Press RING DELAY twice.

  The lamp above the key will flash, and "RING DELAY CHECK" will be displayed.

- Press the line or DSS keys to be checked. Press SHIFT first if selecting the station on the lower half of a DSS key.

  The display will show the ring delay setting for each DSS or line key pressed.

- To exit ring delay check mode, press RING DELAY again (the mode will be exited automatically 5 seconds after the last keypress).

Setting Ring Delays

Dial Pad Key	Available Values
1	1 ring
2	2 rings
3	3 rings *stations default*
4	4 rings
5	5 rings
6	6 rings
7	7 rings
8	8 rings
9	9 rings
0	no delay (off) *lines default*
∗	no ringing (on)

Table 31

- Press RING DELAY once.

  The lamp above the key will light steadily, and "RING DELAY PROG" will be displayed.

- Using the dial pad, enter the number of rings to delay before ringing at the console begins (**1-9** rings, **0** for no delay, or ∗ for no ringing at the console).

  The display will show the selected ring delay value.

  NOTE – The ring delay setting does not affect station ringing, only the delay before the console starts ringing in addition to the station.

- Press the line or DSS keys to be set to the chosen ring delay value. Press SHIFT first if selecting the station on the lower half of a DSS key.

  To set all stations (not lines) to the same value, press # on the dial pad instead of a DSS key.

  The display will show the number of each DSS or line key that is pressed (or "ALL DELAY" if # is pressed), and the ring delay value.

- To exit ring delay set mode, press RING DELAY again (the mode will be exited automatically 5 seconds after the last keypress).

NOTE – Systems with two consoles (two attendant positions) have separate Ring Delay settings for each console. They must be programmed individually at each console.

Time of Day Clock

The 12-hour time of day clock may be set at any console in a multi-position system. The setting affects all consoles.

- When the console is idle, press HOLD, then TRANSFER, then RELEASE, then **T** (8) on the dial pad.
  "SET TIME" and the current time will be displayed.

- Press RELEASE now if you do not wish to change the time setting.

- Enter the time using the dial pad (hour values less than 10 must be preceded by a "0" digit). For example, to set the time to 9:38, enter **0 9 3 8**.
  The display will show the time entered.

- The time set mode will be exited automatically after the new time setting is entered.

System Administration

This section is intended to assist the administrator of a telephone system which includes a Tone Commander 30e120 Attendant Console. Procedures discussed herein show the administrator how to extract certain statistical data relating to the operation of each attendant position. The implications of each parameter are discussed.

System Traffic Metering

This capability is provided so that the system administrator can assess the operation efficiencies at each attendant position, and record the extent and nature of incoming call traffic.

The following statistical data may be read from any attendant console position:

Statistic	Description
Number of **CALLS**-	– the number of calls that were handled by a particular attendant position.
Average **WORK**-	– the quotient of the aggregate incoming work time divided by the number of incoming calls processed at a particular attendant position.
Average **HELD**-	– the quotient of the aggregate holding time divided by the number of held calls at a particular attendant position.
Average **RINGS**-	– the average number of rings before a particular attendant answers a call.
Number of **ABAN**doned Calls	– the number of abandoned calls that were presented to all active attendant positions, but were never answered. This statistic is allocated to all active attendant positions.
Number of Messages (**MSGS**)	– set by depressing any DSS key while in the message waiting mode and illuminating the associated station message indicator.
CALLS/ Line _____	– indicates the total number of calls answered on a particular line.
RESET CONsole _____	– an opportunity to reset all statistical counters for a particular console, or at all consoles.
RESET LINE _____	– an opportunity to reset the counter for a particular line, or all counters for all lines.

Table 32

NOTE – Words or phrases under the Statistics heading above, which are in bold print, represent actual statistical displays shown at the 30e console. Underlined spaces following such displays will normally identify the affected console or line.

System Statistics

The 30e120 system records usage statistics for each console position and for each 30e line. The system administrator can view or reset these statistics from the system statistics mode.

Usage statistics for a single console position can be viewed (not reset) by the attendant. This console statistics mode is described in the 30e120 Attendant's Guide, doc. #14-280162.

Viewing Console and Line Statistics

Refer to Table 33 for maximum values and available options for each statistics item.

- Press HOLD, then ∗ on the dial pad, then ANSWER, then **OPER** (0) on the dial pad to enter system statistics mode.

    "SYSTEM STATISTICS" will be displayed, followed by a brief help display.

- Press SHIFT to successively display the items in the table on the next page.

    The display will show the item name and the current statistics for the item.
    Console statistics default to console position #1; line statistics default to line #1.

- **Console Statistics**: press a key on the dial pad (1-4) to select the console position.
  Line Statistics: press a line key to select a line.

    The statistics for the selected console position or line will be shown in the display.

- Press RELEASE to exit system statistics mode (the mode will be exited automatically 1 minute after the last keypress).

Resetting Console and Line Statistics

- Enter system statistics mode as explained above.

- Press SHIFT repeatedly until "RESET CON 1?" or "RESET LINE 1?" is displayed.

- **Console Statistics**: press a key on the dial pad (**1-4**) to select the console position, or **#** to select all console positions.
  Line Statistics: press a line key to select a line, or **#** to select all lines.

- Press **0** on the dial pad to reset statistics for the selected console position(s) or line(s).

    or

- Press SHIFT to select another item to view or reset.

    or

    Press RELEASE to exit system statistics mode (the mode will be exited automatically 1 minute after the last keypress).

Help Displays

Help with selecting a statistics item is available by pressing TRANSFER. Help will be displayed continuously until either an item is selected by pressing SHIFT, system statistics mode is exited by pressing RELEASE, or the help display is restarted by pressing TRANSFER again.

After selecting an item by pressing SHIFT, a list of the available options can be displayed by pressing TRANSFER. While help is being displayed you may press a valid option key to stop the help display, press SHIFT to select the next item, press TRANSFER again for the main help display, or press RELEASE to exit system statistics mode.

DISPLAY Statistics Item	Maximum Value	Available Options
CON # CALLS - (# of calls) total number of incoming calls	65535 calls	dial pad keys **1-4** select console positions 1-4
CON # WORK - (avg. work time) average amount of time to handle each call (does not include call hold or transfer time)	99 hours, 59 min., 59 sec	
CON # HELD - (avg. hold time) average amount of time calls were on hold.	99 hours, 59 min., 59 sec	
CON # RINGS - (# of rings) average number of rings before calls were answered	65535 rings	
CON # ABAN - (# of calls) total number of unanswered calls	65535 calls	
CON # MSGS - (# of messages) total number of message lamps turned on	65535 messages	
# CALLS/ (total busy time) number of calls / busy time per line (includes ringing time)	65535 calls; 99 hours, 59 min., 59 sec	line keys select lines 1-30
RESET CON #? reset console statistics	–	dial pad keys **1-4** select console positions 1-4 dial pad key **#** selects all consoles dial pad key **0** resets statistics for selected console(s)
RESET LINE #? reset line statistics	–	line keys select lines 1-30 dial pad key **#** selects all lines dial pad key **0** resets statistics for selected line(s)

Table 33

Troubleshooting

Introduction

The Tone Commander 30e120 is capable of conducting self-testing routines at power-up and recording various error conditions while it is operating. This built-in testing capability is invaluable in quickly isolating the sources of intermittent failures, which are often difficult to trace without the use of expensive test equipment.

Initialization Diagnostics

When power is applied to the 30e120, certain start-up routines are conducted to check operating integrity. The receipt of three successive beep tones indicates that operating voltages are within prescribed parameters, and the common audible circuitry is functional.

If these beep tones are not heard:

1. Check the power source.
2. Remove/replace the console and/or CPU.

Operating software and processor integrity are verified with the momentary showing of the following displays:

```
        [ 30e OK ]            – 30e CPU
  [ DATALINK LMx OK  ]        – 120 CPU and datalink to 30e CPU
  [  CONSOLE 30e OK  ]        – 30e Console
  [  CONSOLE LMx OK  ]        – 120 Console
```

When the display clears, only the time, which defaults to 12:00, should be showing. Time setting procedures should conducted at this point.

Line Monitor and Call Transfer Diagnostics

A diagnostic program built into the 30e will display the console number, status of connected 120 CPUs, and the status of the last Release w/Supervision transfer for troubleshooting purposes.

The VOL ▲ key advances through the diagnostic displays. Previous screens can be reviewed by pressing the VOL ▼ key.

- Press HOLD, then TRANSFER, then RELEASE, then **5** on the dial pad to enter diagnostics mode.
    The number of this console, for example "30e Console 1", will be displayed.
    This number corresponds to the console number on the 30e block or the console test jack number on the 30e CPU.

- Press VOL ▲ to view the 120 CPU ("Line Monitor") status.
    The status of the 120 CPUs will be displayed, for example:
    "LM1: ACTIV LM2:DOWN"   (ACTIV = connected, DOWN = not connected).
    The "LM" numbers correspond to the 120 port numbers on the 30e CPU.

- Press VOL ▲ to view the status of the last Release w/Supervision transfer. One of the following types will be displayed:

    1. "CP:NORMAL CALL PROG"
    2. "CP:DIAL - x.xx x.xx" (dial tone)
    3. "CP:BUSY - x.xx x.xx" (busy tone)
    4. "CP:CONF - x.xx x.xx" (confirmation tone)
    5. "CP:RINGB - x.xx x.xx" (ringback tone)
    6. "CP:REORD - x.xx x.xx" (re-order tone)
    7. "CP:ANSWR - x.xx x.xx" (call answered)
    8. "CP:ERROR - x.xx x.xx" (dialing error)
    9. "CP:INCOM - x.xx x.xx"
    10. "CP:STATION NOT READY"
    11. "CP:BUSY WHEN DIALING"
    12. "CP:NO RING GENERATOR"
    13. "CP:DIAL INCOMPLETE"

Type **1** shows no special call progress information, or hook status release successful.

Types **2**-**8** represent the call progress tones; abbreviations are used because the display can show only 20 characters. The *x.xx* values are the on and off times (seconds) of the recorded call progress tones.

Type **9** represents an incomplete call progress detect.This means that none of the above call progress tone types could be discerned. The values of the on and off times are displayed.

Type **10** represents a station off hook when the background dialer is ready to transfer to the station.

Type **11** represents a station off hook when the background dialer is autodialing to the station.

Type **12** represents no ring generator detected within 7 seconds after the completion of autodialing.

Type **13** represents the autodialing sequence not completing within 10 seconds. This usually means no dialtone was present when a dialtone detect code is programmed in the autodial sequence.

- Press VOL ▲ to view the extended call progress status.

    If the previous screen displayed types 2-9, the display will now show the time (seconds) from the beginning of the "on" time to the time a call progress tone is detected.

    If the previous screen displayed other than type 1 or 10-13 then the following display is shown: "CP:NO EXTENDED INFO"

- Press RELEASE to exit diagnostics mode.

System Description

Consoles

30e Answering Console

The 30e console houses a 20-character fluorescent display, line status indicators, line and call processing keys, a common audible transducer, an electronic voice network, and a microcomputer to control their operation. The factory-provided hearing aid compatible handset utilizes an electret (carbon clone) element.

Tone Commander consoles are designed to provide superior operating capabilities in any working environment.

- The vacuum fluorescent display on the 30e is adjustable, can be seen from almost any angle, and is immune to overhead lighting glare. This allows displayed information to be viewed from greater distances than with nonfluorescent versions.

- Whenever possible, call processing routines are accomplished with single keystrokes.

- Multiple indicators are used to improve status recognition.

Following is a description of the keys, indicators, and connectors on the 30e console:

- **Display** – 20 character alphanumeric display gives information about calls ringing at the console, and is used during console programming. A time of day clock is displayed when the console is idle.

- **Line Keys** – when a line key is pressed, the console network is connected to the selected line. If a second line key is pressed, the first line is automatically put on hold and the second line is accessed (Auto Hold). Spare line keys may be used to activate night service or Quick Mode, park calls, override call transfer to busy stations, or to access paging systems.

- **Hold Lamps (H** symbol) – indicate hold and hold recall states of the lines.

- **Line Lamps** (telephone symbol) – indicate busy and ringing states of the lines.

- **HOLD Key** – when the console is on an active line and the hold key is pressed, a hold bridge is placed across the selected line and the console network is released from the connection.

- **TRANSFER Key** – when the transfer key is pressed, a hookflash (momentary open loop) is generated on the selected line. This allows the attendant to transfer calls or access special features of the telephone system.

- **RELEASE Key** – when the console is on a line and the release key is pressed, the console network is released from the connection, the line becomes idle, and its lamp will turn off.

- **CONNECT Key*** – allows an attendant to immediately release from a line after a DSS transfer, to answer another one. System circuitry maintains the line until the called station rings, then automatically releases.

- **ANSWER Ke**y – automatically seizes a call appearing in the alphanumeric display.

- **RING DELAY Key** – used to enter/exit ring delay check mode or ring delay programming mode.

- **PICK UP Key*** – used to answer a ringing station not appearing in the alphanumeric display.

- **VOL Keys** – adjust the console ringer volume.

- **Dial Pad** – generates DTMF signaling on a selected line. Dial pad keys are also used to enter console programming values.

   * These keys are active only when used with the companion 120 console.

120 Call Processing Console

The 120 console has 60 station keys, used for DSS (Direct Station Select) or optional autodialing of outside line or special feature access numbers. An additional 60 stations are available via the SHIFT key on the 30e console. Busy lamps are provided for 120 monitored stations.

Attendant Console Cabling

Each 30e console requires (2) three-pair, #24 gauge twisted cables. The two cable runs should not exceed 500 feet each. One pair on the voice/data cable is analog voice. The two remaining pairs transmit proprietary protocol at 1200 baud using the RS-422 standard. The second cable uses all three pairs to provide power to the console. Power for consoles at attendant positions #3 and #4 is supplied by an external PSE-3 power unit.

Central Processing Units (CPUs)

30e Central Processing Unit

The 30e Central Processing Unit (CPU) is a wall mounted device which houses the main circuit board, optional line and console expansion circuit boards, and power supply.

1. Main Circuit Board – this unit contains the power supply, microprocessor-based control logic, dial tone detect circuits, data and voice links for two consoles, remote power control circuits for two consoles, four DTMF dialer circuits, and a Music On Hold input circuit. System memory is retained during power failure..

2. Line Expansion Circuit Board – this board contains 10 line circuits. Two of these boards are supplied with the CPU, and one can be added to increase system capacity to 30 lines.

3. Station Expansion Circuit Board – this board allows two additional consoles to be added to the system. Included are dial tone detect circuits, two console voice link circuits, two console data link circuits, and four DTMF dialer circuits.

External connections to the 30e CPU are made by using 50-pin Amphenol connectors. Music On Hold may be optionally connected to an RCA-type audio jack on the CPU. Modular console jacks on the main circuit board are provided for testing and programming.

120 Central Processing Unit

The 120 Central Processing Unit (CPU) is a wall mounted device which houses the main circuit board, station monitor circuit boards, and power supply.

1. Main Circuit Board – this unit contains the power supply, microprocessor-based control logic, power outputs for two consoles, RS-232 port, 30 station monitor circuits, and a data link to the 30e CPU.

2. Station Monitor Circuit Boards (3) – these boards contain 30 station monitor circuits each.

External connections to the 120 CPU are made by using 50-pin Amphenol connectors. Modular console power jacks on the main circuit board are provided for testing and programming.

System Features

Line and Console Expandability

The basic 30e CPU is equipped for 20 lines and two consoles. Line and/or console expansion cards can be installed to increase system capacity to 30 lines and four consoles.

The 120 CPU can monitor 120 stations. A second 120 CPU, with an additional 120 console at each position, allows monitoring of 240 stations.

Four Console Capability

The 30e CPU can support two console positions; however, with the insertion of the optional CEC-2 console expansion card, two additional console positions will be supported. In addition, the appropriate number of PSE-3 power supply expanders will be required. Line and station appearances are identical at each console position (square configuration). Holding status is indicated at all console positions. Special line key options such as paging access, night service, etc., appear at all console positions when programmed. Certain operating features such as Queue Priority, Ringing Type, Line Privacy, and Answer Use may be programmed on a per console basis.

Skinny Wire Console Connection

Two three-pair cables are required between each 30e console and the equipment room. One three-pair cable is required for the 120 console.

The 30e console uses three pairs for data and voice and three pairs for power. Three 6-conductor modular jacks are located at the rear of the console; one for voice/data, one for data out to the 120 console, and one for power.

All three pairs from the equipment room to the 120 console are used to supply power. A short modular line cord provides the data connection from the 120 console to the 30e console, or to the first 120 console in a 240-station system.

Installer/User Programmability

Both installer and user can program the system from the consoles. The installer programs system configuration options, line programmable features, and special feature key assignments. The user can program customized features such as ring delays, Direct Station Selection (DSS) dialing, autodialing numbers, line/station name identification, Hold Recall Time, Queue Priority, etc.

Ringing Queue

Calls to be answered by a console are placed in queue. The nature of the queue (i.e., station calls only, stations before lines, lines before station, or first in-first out "FIFO") is selectable on a per console basis.

Distinctive Ringing Detection

Used in conjunction with the Distinctive Ringing capability provided by the telco central office or PABX, unanswered station calls can be displayed alphanumerically or ignored, depending on the type of ringing.

System Traffic Metering

Certain traffic statistics, involving all lines (appearing on the 30e console) and the activity at all console positions, may be read and reset by a system administrator from any console position.

Paging Interface

The Tone Commander PA-24 Paging/Chime Module or an equivalent external, battery-feed paging adapter can be connected to any line key programmed as a Page key. When this is done, the selected line position will be conditioned to operate with either 48 VDC or 24 VDC battery feed circuits, the latter being typical of most paging adapters. The PA-24 can be powered directly from the 30e CPU.

Night Service Interface

The system includes switched contacts to activate either an external ringing circuit (night bell) or a control pair to the central office (night transfer).

The night bell will begin ringing after the shortest ring delay set at either console for the ringing line or station. In place of a standard bell, the PA-24 Paging/Chime Module can be used to produce a chime tone over the paging system.

Typical applications of night transfer are Fixed Night Service or Stop Hunt. The night transfer option utilizes the normally closed relay contacts, causing this feature to be activated in the event of a power failure at the 30e CPU.

Music On Hold Interface

Lines can provide background music while in a holding state. Access is via block terminals or phono jack. An input gain control is provided to adjust Music On Hold to the desired level.

Console Test Jacks

Six pin modular jacks for voice/data are provided on the 30e CPU for four console positions. Power jacks for two positions are provided on both the 30e and 120 CPUs. These jacks are intended to provide a quick means to verify console-to-CPU operating integrity.

Console Features

Distinctive Audible Signaling

The system recognizes normal or distinctive ringing from the serving central office/PABX and responds with differentiated audible signaling. The 30e console also signals the attendant when held lines are recalling, calls to stations have gone unanswered for a predetermined period of time, confirming programming entries/storage, or when errors have been made involving operation or programming. Incoming call audible signaling is abbreviated whenever the attendant is active on a line.

Ring Delay

Each line and station appearing on a console can be individually programmed to ring at the consoles immediately, after a predetermined number of ringing cycles, or never ring at the consoles. The Ring Delay feature does not affect ringing at the station.

Alphanumeric Display

Calls to be answered are displayed on the 30e console with a three character prefix which indicates the nature of the call (i.e., INC, RCL, HLD, CMP, etc.), followed by the line or station number, then the number of calls in queue. Line or station numbers can be replaced with 14 character names as desired. The display is also used to view programming options and confirm all entries. A scrolling HELP display is available while in the configuration programming mode.

Tone Commander 30e120 Installation Instructions

Single-key Answering

Calls to lines or stations that are to be answered by the attendant are alphanumerically displayed according to the selected ringing queue. Depressing the Answer key seizes the call displayed.

Dial Pad DTMF Dialing

The 30e console is equipped with a standard 12 button dial pad. The various tones will persist as long as the desired key is pressed if *fast* dialing speed (10 digits/sec.) has been selected during configuration programming. If *slow* speed (6 digits/sec.) has been selected, digits are buffered and sent with a tone on period of 80 ms, and 80ms between digits to guarantee minimum tone periods for slow central offices.

Console Traffic Metering

Certain traffic statistics involving a particular console position may be read from that position.

Time of Day

The alphanumeric display shows the time of day whenever the console is idle.

Variable Ringer Volume

VOL ▾ and VOL ▴ keys are provided on the face of the 30e console to adjust the level of the audible ringer in accordance with the operating environment. A bar graph display is provided for referencing.

Handset Jack Connection

A four pin modular jack is located on the left side of the 30e console.

Handset

A K-type, hearing aid compatible handset with electret transmitter is provided with the 30e console.

Direct Line Access

Each line is accessible via a dedicated key for answering, holding, transferring and originating calls.

I-Use Indication

A fluttering line status lamp identifies the particular line to which the handset or headset is connected.

Line Privacy

Individual lines may be programmed to exclude third party access to ongoing calls by the attendant.

Line Hold

Each line can be placed in a "Hard Hold" condition at the console. Music on Hold, if optioned and a source provided, is connected to the line. A line on "Hard Hold" can be released from the console when bridged by either a telephone set or another console. A valid loop interruption from the central office will also release the line.

Line Hold Indication

A flashing Line Hold lamp **H** indicates a line placed on hold by the attendant. A steady **H** indication identifies a line placed on hold at a companion console.

Automatic Line Hold

Active lines may automatically be placed on "Hard Hold" by either depressing another line key or the Answer key while a call is being displayed.

Hold Recall

A call placed on Hold for longer than a predetermined time period is identified with a unique audible ringing. The **H** indication for the affected line is also unique.

Line Transfer

Calls originating or answered at the console can be placed in a "Soft Hold" or Consultation Hold condition at the serving Centrex Central Office/PABX by "hookflashing" (pressing the transfer key), then dialing the desired station number.

Manual Call Transfer

Calls transferred to stations using Direct Station Selection (DSS) keys on the 120 console are managed by the console system until answered by the called party or recalled to the console after a predetermined period. Depressing the desired DSS key, then the Connect key, allows the attendant to process subsequent calls, even if previous calls have not yet rung at their stations. There is no need to wait until all transfer station digits have been dialed and ring back tone received.

Override Key (optional)

This key will override the console's display of "BUSY" or "CMP" when transferring a call to a busy station via DSS key. The station busy condition can be ignored for call-forwarded stations by using the Override key on a per-call basis, or via DSS programming options. A spare line key is used to provide this feature.

Park Key (optional)

Calls for a party who is not at their desk can be "parked" by pressing the Park key. A parked call is on hold, and can be retrieved from any station by dialing the Directed Call Pickup - Barge In access code followed by the appropriate line number. Unretrieved parked calls will recall the console after a predetermined delay. A spare line key is used to provide this feature.

The central office must support Disconnect Supervision for barged-in calls – refer to the Telco/PABX Requirements section. The park feature is available only for stations that have key appearances on the 120 console.

Page Key (optional)

Any line key on the 30e console can be programmed to be a Page key. The selected key position is automatically assigned line privacy, answer use exclusion, and automatic line hold exclusion.

Pressing the Page key places the currently selected line on hold and connects the attendant to the paging system.

Night Key (optional)

Any line key on the 30e console can be programmed to be the Night key. The selected key, when depressed, will activate/deactivate night service operation. Steady illumination of the associated line lamp indicates that night service mode is active.

Quick Mode Key (optional)

The first unanswered station in call queue is automatically pre-answered after the appropriate ring/recall delay, placed on hold, then displayed for immediate answer. This feature is activated by any spare line key that is programmed as a Quick Mode (quick answer mode) key. *The Quick Mode feature is available only for stations that are monitored by the console, and is not recommended for installations with more than one console.*

NOTE – It is highly recommended that lines appearing at the console be configured for disconnect supervision at the serving central office. When this is done calls that are "pre-answered" will be automatically released whenever the calling party abandons the call.

Autodialing

Any spare DSS key on the 120 console can be used for autodialing while on an active line.

Busy Lamp Field (BLF)

Each station connected to the 120 CPU has a dedicated lamp that indicates its status (i.e. idle, off-hook, or ringing).

Direct Station Selection (DSS)

DSS keys on the 120 console provide quick and efficient transfer of all calls. Station positions 61 through 120 (and 181-240 on systems with two 120 consoles per position) must be preceded with the depression of the Shift key on the 30e console. Each key position must be programmed with the appropriate dialing instructions - typically a Flash, Dial Tone Detect, then the station digits. *The DSS feature is available only for stations that are monitored by the 1030/1560.*

Call Screening

Calls requiring attendant intervention are accommodated by depressing the desired DSS key twice. When this is done, a SCN prefix followed by the name or number of the station is displayed until the call is released.

Camp-on

Calls transferred by a DSS key to stations that are busy are automatically placed on hold, then transferred as soon as the station user hangs up. If the station user does not hang up within a predetermined period, the call rerings and is displayed for further processing. It is highly recommended that a music source be provided, and affected lines be optioned for Music On Hold. *The Camp-on feature is available only for stations that are monitored by the console.*

Station Recalls

Calls transferred by a DSS key to idle stations which go unanswered for a predetermined period, re-ring and are displayed at the console.

Station Call Pickup

Unanswered calls that are indicated in the busy lamp field but not in the alphanumeric display can be answered at any time by depressing the Pickup key, then the desired DSS key.

Telco/PABX Requirements

Certain signaling protocols and features of the telco/PABX host are required for proper operation.

Required System Configuration

The C.O. and station lines must originate from either the same Centrex Common Block or the same PABX tenant partition.

Required Signaling Protocols

1. **-42.5 to -56.5 VDC C.O. battery**

2. **40 to 130 Vrms @ 20 or 30 Hz Ring Generator**

3. **Loop start**

4. **Disconnect Supervision for Abandoned Calls**

   The central office opens Tip and Ring (removes the source of DC voltage) for a brief interval whenever the calling party disconnects prior to the called party. This protocol is required to support automatic hold release and Quick Mode.

5. **Disconnect Supervision for Barged-in Calls**

   The central office opens Tip and Ring for a brief interval whenever a call is barged in. This protocol is required if the call park feature is used.

Required Attendant Line Features

1. **Touch Tone Dialing** – all manual or auto dialing from the 30e120 consoles is DTMF.

2. **Station Call Transfer** – to use the Transfer key or the programmable FLASH command while autodialing to transfer incoming calls. Typically, inbound calls are transferred by "hookflashing", receiving new dial tone, then dialing the desired station. In most instances call transferring is limited to stations within the same PABX or Centrex Common Block.

   CAUTION – In some host systems, hookflashing automatically transfers inbound calls to a proprietary attendant position. This feature is often referred to as Call Transfer-Attendant and is not compatible with Tone Commander console operation.

3. **Directed Call Pickup, NonBarge-In** – to retrieve unanswered station calls showing in the alphanumeric display.

Optional Line Features

1. **Dedicated nonhunting attendant lines** – used to retrieve unanswered station calls. It is recommended that (1) nonhunting line per 10 attendant lines per console be provided for this purpose. This will allow dedicated access, unaffected by inbound traffic, and prevent call collisions (glare). Refer to the Answer Use line feature described on page 54.

2. **Directed Call Pickup-NonBarge-In** – to retrieve unanswered station calls showing in the alphanumeric display.

Required Station Feature

Call Pickup – all station lines monitored by the 30e120 must be assigned to a Call Pickup Group.

IMPORTANT – Call Forward - No Answer is **not** recommended because it conflicts with, and may defeat, the operation of the 30e120 Ring Delay and Name Display features.

Optional Station/Line Features

Additional features may be optioned as required.

IMPORTANT – Whenever the Call Waiting feature is invoked on a busy station, such a call will not recall to the 30e console. Ring Delay and Recall Ring parameters do not apply because the station in question is in a busy rather than a ringing state.

Compatibility with Other Products

Music On Hold

The Music On Hold input on the 30e CPU is compatible with telco feed, low impedance, balanced subscriber background music services such as Muzak. Always terminate such a line with a resistor equal to the characteristic impedance of the line, usually 600 ohms. AM/FM tuner and tape player outputs are typically unbalanced high impedance music sources which require shielded cable. Characteristic impedances vary from 600 to 50K ohms.

Night Service

The Night Service contacts are compatible with most source voltages and annunciator loads. Please refer to the Specifications section for contact ratings. Consult the System Features section for programmed options.

Tone Commander's PA-24 Paging/Chime Module can announce night ringing over a paging system, in addition to providing voice paging access from the 30e console.

Paging Access

The 30e120 is compatible with any paging system that provides a Tip/Ring talk battery feed circuit. Such circuits can be cross connected to any spare line position on the console.

Tone Commander's PA-24 Paging/Chime Module interfaces any paging amplifier to the 30e, and derives power from the 30e CPU.

Voice Mail

Most on-premise voice mail systems are compatible with the 30e120 system. Voice mail is usually accessed from a spare DSS key on the 120 console.

30e Specifications

All values listed in this section are nominal, and may differ from the actual values.

Central Office Interface

Local Telco Ground and CPU Ground Differential	±3 V max.
C.O. Battery Range	-42.5 V to -56.5 V
C.O. Ringing Range	40 to 130 V rms @ 20 or 30 Hz, superimposed on C.O. battery
Off-hook/On-hook Detection Point	26 V across Tip and Ring
Loop Resistance to C.O., Including C.O. Battery Feed . .	400 to 2000 ohms

FCC

Registration Number	AHIUSA-18143-CF-T
Ringer Equivalence	0.0B

Console Interface (CPU to Console)

Number of Consoles Supported	four maximum, external PSE-3 power supply and CEC-2 Console Expansion Card required for more than two consoles
Max. Distance to Console. . . .	500 feet, using 24 AWG wire

Dialer

Dialing Type.	DTMF Tone only
Autodialing Speed	6 or 10 digits/sec
Manual Dialing Speed	follows dial pad keystrokes when autodialing speed is set to 10 digits/sec; digits are buffered and sent with a tone on period of 80 ms, and 80 ms between digits when autodialing speed is set to 6 digits/sec

Music Input

Input Impedance	10k ohms, balanced
Typical Input Level	0.5 v to 1.5 v RMS
Gain Adjustment Range	40 dB

Night Service

Night Transfer.	constant relay contact closure
Night Ringing	relay contacts close during console ringing
Relay Contact Rating	1 amp, 50 VA

Tone Commander 30e120 Installation Instructions

Installer Programmable Features

Abandoned Ring Time . . . . . 2 - 10 sec

Recall Rings . . . . 1 - 9 rings, or no recall

Pickup Code Sequence . . . . . first or last

Dialing Speed . . . . 6 or 10 digits/sec

Pause Time . . . . 200 - 900 msec

Hookflash Time . . . . 500 ms - 1 sec

Dial Tone Detect Time . . . . 500 ms - 2 sec

Hold Recall Time . . . . 30 sec - 3 min, or no recall

Hold Release Time . . . . . . 40 ms - 2 sec

Park Recall Time . . . . 30 sec - 3 min

Night Service Mode . . . . . . night transfer, night ringing for lines only, or night ringing for lines and stations

Queue Priority . . . . stations only
lines+stations, stations have priority
lines+stations, lines have priority
lines+stations, first calls have priority
(selectable per console)

Alert Type . . . . normal ringing, distinctive ringing, or both

Ringing Type . . . . long or short (selectable per console)

Camp-On . . . . on or off (selectable per console)

Line Privacy . . . . on or off (selectable per line and per console)

Answer Use . . . . on or off (selectable per line and per console)

Music on Hold . . . . on or off (selectable per line)

Special Feature Keys . . . . . Page, Night, Quick Mode, Override, Call Park
(each may be assigned to any spare line key; Quick Mode, Override, and Call Park keys are selectable per console)

Attendant Programmable Features

Line Identification Display . . . 14 alphanumeric characters
(selectable per line)

Ring Delays . . . . 1-9 rings, no delay, or no ringing
(selectable per line)

Programming Data Retention

Data Retention . . . . 10 years

30e Power Requirements

CPU . . . . 117 VAC ±10%, 60 Hz, @ 30 VA max.

Console . . . . 500 mA max. @ 28 VDC nominal
(supplied by CPU or PSE-3 power supply)

30e Fuses

CPU . . . . (2) AGC 2   2 A, 250 V

30e Physical

Console Dimensions . . . . . . 6 ½" H, 11 ¾" W, 10 ½" D
(including handset cradle; display in max. vertical position)

Console Weight . . . . 3 lbs.

CPU Dimensions . . . . 17 ¾" H, 18 ¾" W, 5 ¼" D

CPU Weight . . . . 10 lbs.

30e Environmental

Console
Operating Temperature . . . . . 32° to 104° F (0° to 40° C)

CPU
Operating Temperature . . . . . 32° to 122° F (0° to 50° C)

Console and CPU
Storage Temperature . . . . . . -4° to 140° F (-20° to 60° C)

Humidity . . . . 5% to 95%, noncondensing

120 Specifications

All values listed in this section are nominal, and may differ from the actual values.

Central Office Interface

Local Telco Ground and
CPU Ground Differential   ±3 V max.

C.O. Battery Range . . . . -42.5 V to -56.5 V

C.O. Ringing Range . . . . . 40 to 130 V rms @ 20 or 30 Hz, superimposed on C.O. battery

Off-hook/On-hook
Detection Point . . . . 26 V across Tip and Ring

Loop Resistance to C.O.,
Including C.O. Battery Feed . . 400 to 2000 ohms

FCC

Registration Number AHIUSA-18143-CF-T

Ringer Equivalence 0.0B

Station Interface

Station Capacity . . . . 120 stations

Max. Distance to Stations . . . 1000 feet, using 24 AWG wire

Attendant Programmable Features

Autodial Numbers . . . . 24 digits (selectable per station)

Station Identification Display . . 14 alphanumeric characters
(selectable per station)

Ring Delays . . . . 1-9 rings, no delay, or no ringing
(selectable per station)

120 Power Requirements

CPU . . . . 117 VAC ±10%, 60 Hz, @ 30 VA max.

Console . . . . 500 mA max. @ 28 VDC nominal
(supplied by CPU or PSE-3 power supply)

120 Fuses

CPU . . . . (2) AGC 2   2 A, 250 V

120 Physical

Console Dimensions . . . . . . 6 ½" H, 9 ¾" W, 10 ½" D

Console Weight . . . . 3 lbs.

CPU Dimensions . . . . 17 ¾" H, 18 ¾" W, 5 ¼" D

CPU Weight . . . . 11 lbs.

120 Environmental

Console
Operating Temperature . . . . . 32° to 104° F (0° to 40° C)

CPU
Operating Temperature . . . . . 32° to 122° F (0° to 50° C)

Console and CPU
Storage Temperature . . . . . . -4° to 140° F (-20° to 60° C)

Humidity. . . . . 5% to 95%, noncondensing

Maintenance

After initial installation, the 30e and 120 require little or no maintenance, as long as adherence to the criteria discussed in the Site Preparation section is maintained. In this effort the following guidelines are suggested:

DON'T allow stored items to accumulate around the CPU, and therefore cut off adequate ventilation.

DON'T store toxic or fume producing janitorial supplies or chemicals in the near vicinity of the CPU.

DON'T plug any other electrical products into the same circuit as the CPU, even temporarily.

DON'T allow storage items or tools to come in contact with the CPU or punchdown blocks. In case of the latter, plastic block covers are highly recommended.

DON'T spray cleaners or solvents directly on to the 30e or 120 console. Use only a very dilute soap/water solution applied to damp rag.

DON'T use adhesive-backed labels on the face of the console. Such labels may impede button travel. Migrating adhesives could also cause permanent damage.

DO use the provided nonadhesive key designations.

DO conduct periodic inspections to check the above mentioned items.

DO provide for ready access.

Operational Checkout

It is a suggested operating practice for an attendant to periodically check all active lines on the 30e for the ability to receive and "break" dial tone.

Recommended Spare Parts

On those occasions where components need to be replaced either due to troubleshooting procedure or obvious failure (i.e., smoke, inactivity, etc.), the stocking of spare parts is highly recommended.

In most cases one (1) 30e console, (1) 120 console, one (1) 30e CPU, one (1) 120 CPU, and one (1) LEC-10 line card will provide adequate backup.

In those cases where a customer demands full backup capability or has to maintain many systems, two (2) 30e consoles, two (2) 120 consoles, two (2) 30e CPUs, two (2) 120 CPUs, one (1) LEC-10 line card, one (1) CEC-2 console card*, and one (1) PSE-3 power supply* are recommended. In this case, full coverage is maintained even when spares are in for repair.

* Only required if supporting systems with more than three consoles.

Service

Repair of the Tone Commander 30e120 must be done by Tone Commander. Prior to equipment removal, call Tone Commander Technical Support for assistance in determining the source of the problem. This critical action can often prevent needless removal of equipment and subsequent customer inconvenience.

Tone Commander
Technical Support Department
11609 49th Place West
Mukilteo, WA 98275-4255 USA

Phone: (800) 524-0024
(425) 349-1000

Fax: (425) 349-1010

E-mail: tech@tonecommander.com

Web: www.tonecommander.com

Tone Commander is committed to meeting the product needs of our customers. Please write or call us with any suggestions for improvement.

Warranty

Tone Commander Product Warranty

For a period of one year from date of dealer purchase, but not to exceed 16 months from date of manufacture, Tone Commander Systems, Inc. (Tone Commander) warrants its products to be free from defects in material and workmanship under conditions of normal use and service. Tone Commander shall, at its option, repair or replace any defective product which, in its opinion, has not been misused, damaged, or improperly installed.

Repair or replacement under this warranty will be performed at Tone Commander's factory. Authorization must be obtained from Tone Commander prior to returning a product for repair. Freight must be prepaid for all units returned to Tone Commander. Units repaired under warranty will be shipped UPS Ground (or equivalent), freight prepaid by Tone Commander.

Products that are older than the warranty period, but less than 7 years old, or still manufactured by Tone Commander may be repaired at the factory for a flat rate charge. Repaired out-of-warranty units are warranted for 90 days from the date of repair.

The repair or replacement of a product under this warranty represents the entire obligation of Tone Commander; Tone Commander shall not be liable for any special or consequential damages resulting from or caused by any defect, failure, incapacity or malfunction of any of its products.

> *The foregoing express warranty is in lieu of all other warranties, express or implied, including but not limited to any implied warranty of merchantability, fitness, or adequacy for any purpose or use, quality, productiveness or capacity; Tone Commander, to the extent permitted by law, hereby disclaims all such other warranties.*

FCC Requirements

The Tone Commander Models **30e** and **120** comply with Part 68 of the FCC Rules. The label affixed to this equipment contains, among other information, the FCC Registration Number and Ringer Equivalence Number (REN) for this equipment. You must, upon request, provide this information to your telephone company.

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your telephone number is called. In most, but not all areas, the sum of the RENs of all devices connected to one line should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, you should contact your local telephone company to determine the maximum REN for your calling area.

The following jacks must be ordered from the telephone company in order to interconnect this product with the public communication network: **RJ-21X**.

If your 30e or 120 causes harm to the telephone network, the Telephone Company may discontinue your service temporarily. if possible, they will notify you in advance. But if advance notice is not practical you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

Connections to party lines are subject to state tariffs. Contact your local telephone company if you plan to use this equipment on party lines.

This equipment cannot be used on public coin service lines provided by the telephone company.

The 1030/1560 is hearing-aid compatible (HAC) per Section 68.316, FCC Rules and Regulations.

If you have trouble with the 30e or 120, please contact us at the address listed on the back of this manual for information on obtaining service or repairs. The telephone company may ask that you disconnect the 30e or 120 from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

NOTE – This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Industry Canada Requirements

The Industry Canada label identifies certified equipment. The certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. Industry Canada does not guarantee the equipment will operate to a user's satisfaction.

Before installing this equipment, make sure you are permitted to connect it to the facilities of the local telecommunications company. You must also install the equipment using an acceptable method of connection. In some cases you may also extend the company's inside wiring for single line individual service by means of a certified connector assembly (telephone extension cord). You should be aware, however, that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designed by the supplier. Any repairs or alterations made by a user to this equipment, or equipment malfunctions, may give the telephone communications company cause to request the user to disconnect the equipment.

For your own protection, make sure that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Do not attempt to make electrical ground connections yourself; contact the appropriate electric inspection authority or electrician.

LOAD NUMBER: See the FCC label.

The load number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to the telephone loop used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices, subject to the requirement that the total of the load numbers of all the devices not exceed 100.

Compliance Notice

This digital apparatus does not exceed the Class A limits for radio noise emissions for digital apparatus as set out in the Radio Interference Regulations of Industry Canada.

Avis de conformation

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la class A prescrites dans le Reglement sur le brouillage radioelectriques edicte par le ministere des Communications du Canada.

30e Configuration Sheet
System Programmable Features

STATION KEY	FEATURE	DIAL PAD KEYS	AVAILABLE VALUES	DEFAULT VALUE	ACTUAL VALUE
A	'ABANDON' Ring Time	2 - 9, 0	2 - 9 sec, 10 sec	5	
B	'RECALL' Rings	1 - 9, 0	1 - 9 rings, no recall	3	
C	'DCP DIAL' Sequence	0, 1	first, last	first (0)	
D	'DIAL SPEED'	6, 0	slow (6 digits/sec), fast (10 digits/sec)	fast (0)	
E	'PAUSE' Time	2 - 9	200 - 900 msec	700	
F	'FLASH' Time	5 - 9, 0	500 - 900 msec, 1 sec	600	
G	Dial Tone 'DETECT' Time	1 - 9, 0	500, 600, 700 msec, 1, 1.2, 1.5, 1.8, 2 sec	700	
H	'HOLD' Recall Time	3 - 6, 9, 1, 2, 0	30 - 60, 90 sec, 2, 3 min, no recall	90	
I	Hold 'RELEASE' Time	1 - 8	45, 80, 200, 400, 600, 800 msec 1, 2 sec	600	
J	'PARK' Recall Time	3 - 6, 9, 1, 2	30 - 60, 90 sec, 2, 3 min	90	
K	Night 'BELL' Mode	1, 2	lines only, lines + stations	lines only (1)	
L	Queue 'PRIORITY'	1 - 4	stations only, stations > lines, lines > stations, lines + stations (FIFO)	FIFO (4)	
M	'ALERT TYPE'	1, 2, 0	normal ringing, distinctive ringing, both	both (0)	
N	'RNG TYPE'	1, 0	long, short	short (0)	
O	'SYSTEM CAMP-ON'	0, *	off, on	off (0)	
P	'RECORD STATS"	0, *	off, on	on (1)	

DIRECTED CALL PICKUP CODE	

30e Configuration Sheet
Line Programmable Features

(Default settings for all lines are shown in ***BOLD ITALICS***.)

LINE KEY NO.	LINE NAME I.D. or SPECIAL USAGE KEY • **Page** • **Night** • **Quick Mode** • **Override** • **Call Park**	PRIV. WHEN BUSY		ANS. USE		RING DELAY (***NO RINGING***, NO DELAY, 1-9 RINGS)	TELEPHONE NUMBERS
		OFF	ON	***OFF***	ON		
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

30e Configuration Sheet
Line Programmable Features

(Default settings for all lines are shown in ***BOLD ITALICS***.)

LINE KEY NO.	LINE NAME I.D. or SPECIAL USAGE KEY • Page • Night • Quick Mode • Override • Call Park	PRIV. WHEN BUSY		ANS. USE		RING DELAY	TELEPHONE NUMBERS
		OFF	ON	***OFF***	ON	(***NO RINGING***, NO DELAY, 1-9 RINGS)	
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

120 (#1) Configuration Sheet, DSS Keys 1-60

DSS keys are numbered vertically on the console.

DSS KEY	DSS / AUTODIAL NUMBER (24 digits max.)	USER NAME (14 characters max.)	DSS KEY	DSS / AUTODIAL NUMBER (24 digits max.)	USER NAME (14 characters max.)
1			31		
2			32		
3			33		
4			34		
5			35		
6			36		
7			37		
8			38		
9			39		
10			40		
11			41		
12			42		
13			43		
14			44		
15			45		
16			46		
17			47		
18			48		
19			49		
20			50		
21			51		
22			52		
23			53		
24			54		
25			55		
26			56		
27			57		
28			58		
29			59		
30			60		

120 (#1) Configuration Sheet, DSS Keys 61-120

DSS keys are numbered vertically on the console.

DSS KEY	DSS / AUTODIAL NUMBER (24 digits max.)	USER NAME (14 characters max.)	DSS KEY	DSS / AUTODIAL NUMBER (24 digits max.)	USER NAME (14 characters max.)
61			91		
62			92		
63			93		
64			94		
65			95		
66			96		
67			97		
68			98		
69			99		
70			100		
71			101		
72			102		
73			103		
74			104		
75			105		
76			106		
77			107		
78			108		
79			109		
80			110		
81			111		
82			112		
83			113		
84			114		
85			115		
86			116		
87			117		
88			118		
89			119		
90			120		

120 (#2) Configuration Sheet, DSS Keys 121-180

DSS keys are numbered vertically on the console.

DSS KEY	DSS / AUTODIAL NUMBER (24 digits max.)	USER NAME (14 characters max.)	DSS KEY	DSS / AUTODIAL NUMBER (24 digits max.)	USER NAME (14 characters max.)
121			151		
122			152		
123			153		
124			154		
125			155		
126			156		
127			157		
128			158		
129			159		
130			160		
131			161		
132			162		
133			163		
134			164		
135			165		
136			166		
137			167		
138			168		
139			169		
140			170		
141			171		
142			172		
143			173		
144			174		
145			175		
146			176		
147			177		
148			178		
149			179		
150			180		

120 (#2) Configuration Sheet, DSS Keys 181-240

DSS keys are numbered vertically on the console.

DSS KEY	DSS / AUTODIAL NUMBER (24 digits max.)	USER NAME (14 characters max.)	DSS KEY	DSS / AUTODIAL NUMBER (24 digits max.)	USER NAME (14 characters max.)
181			211		
182			212		
183			213		
184			214		
185			215		
186			216		
187			217		
188			218		
189			219		
190			220		
191			221		
192			222		
193			223		
194			224		
195			225		
196			226		
197			227		
198			228		
199			229		
200			230		
201			231		
202			232		
203			233		
204			234		
205			235		
206			236		
207			237		
208			238		
209			239		
210			240		