Rauland

TC4001 Telecenter® IV
Software Revisions

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The Purpose of this Manual

This manual summarizes the principal changes made in the current software for the Telecentcr N and in earlier versions. If you are updating an earlier version of software, you can look through the summaries of the succeeding versions to see how your system will be affected and what programming changes might be needed as a result. (For example, if you replace Version 12 with Version 102 software, you would read the summaries for Versions 14, 100, and 102.) Complete information about the current software (e.g., all of the attributes and Location Codes) will be given in the current Telecenter IV programming manual.

Important

The TC4410 CPU is needed to run Version 100 and later editions of the software; older CPUs do not have enough memory.

When updating the programming from an earlier version, leave the EEPROM write-enable jumper in the EN ("Enable") position until the system has been reset. If you are using the dual-EEPROM blocks with an external switch, reset the system twice (once for each switch position).

Note: All of the manuals referred to below are printed as part of the main Telecenter IV manual, KI-143 5("B" or later version).

Orig. 10/88. Rev. 1/89, 1/90, 4/90

Version 106 (Checksum CEB2; Release Date 3/90)

Caller in Transit

When the TC4400 Console is in the auto-release transfer mode, pressing the ***Release*** key after pressing the ***Transfer*** key (but before completely dialing the extension) will return a caller to the Console.

This is to help prevent operators from accidentally hanging up on callers. For example, with the previous software, the operator might press ***Transfer,*** dial an incomplete extension number, then, thinking the full number had been dialed, press ***Release*** to free the Console for another call or operation. I Iowevcr, since the caller would still be connected to the Console, pressing ***Release*** would disconnect the caller from the system.

Bug Fix: Undetected Callers

Symptom: A call that came in close upon the heels of a disconnected call on the same line might be ignored by the Telecenter system. The caller would hear the central office ring the line; however, the Telccentcr system would ignore this ringing. This condition arose when the system was "timing out" the disconnected call in accordance with the setting for Location Code 64078 (typically three seconds). Since the central office ringing began while the trunk line was supposed to be "dead," the system treated this ringing as a mistake.

Fix: The system will now ring the Console or appropriate extension as soon as the time-out period is over.

Software Update: Version 104 (Checksum C6DE; Release Date 1/2/90)

Important: **If you are upgrading the software from a previous version, make sure to enter a value for Location Code 64264 (the hold-reminder interval for the TC4400 Console). A typical value would be "1800" (30 seconds).**

LLM Diagnostic

The LLM diagnostic function (#75) is no longer available.

Hold Reminder

The length of time between hold-reminder rings may now be specified at Location Code 64264 (in 60ths of a second). For example, if a 90-second delay is desired, enter "5400" (70 ***x*** 60) at Location Code 64264.

Note: Hold-remind and incoming-ring may be enabled or disabled while the TC4400 Console is in use (see Location 64224 in KI-1584).

Remote-Answer Recall Beeps

Administrative phones that pick up calls for the Console will hear six quick "beeps" in the receiver when the call had been transferred to ring another phone, received no answer, and was automatically switched back to ring the Console again.

Dial "9" "Echo"

Until now, Telecenter users who wanted to make an outside call via a PBX had to dial the access digit (typically, **"7")** twice: once to reach the PBX, and a second time to obtain the telephone-company dial tone. With the new software, the user only has to dial a single access digit, and the Telecenter system will automatically send the same digit to the PBX. The user will not hear this operation, but will automatically be connected to an outside trunk.

Programming the "Echo" Digit

To set up the "echo" for any single-digit dialing code, select the appropriate Location Code for the desired digit (Locations 64016-64034 for digits 0-9, respectively). Compute the number to be stored there from this formula:

Echo + Rotary + Phys. No. = Code

Echo: Add in "32768" [for no echo, the normal setting, the value is "0").

Rotary Hunt: (N- 1) x 1024. "N" is the number of lines in the rotary hunt group. For example, if there are 10 lines, multiply by 9 and add the result (7260) to the Code. Up to 32 lines can be included in a rotary-hunt group. For standard hunt (controlled by the A:8 Attribute) or no hunt at all, use the standard value, "0." (Rotary Hunt strives to distribute calls evenly among the lines; the standard hunt, in contrast, always looks for the lowest-numbered line available.)

Physical Number: The lowest Physical Number in the hunt group (standard or Rotary).

Note: You can program another single-digit Location for accessing the PBX itself, without going to an outside trunk. Simply omit this "echo" programming and follow the standard formula (see the TCIV ***Programming*** **manual,** KI- 1584).

Since the Teleccntcr system does not sense PBX dial tone, it must be told how long to wait before sending the

"echo digit" to the PBX. Enter this time (in 60ths of a second) at Location 64266; a value of "15" (¼ second) will usually suffice.

Access Restrictions

Three additional settings are needed to assure proper access to the PBX functions and extensions:

- Set up a separate single-digit number, ***without*** an "Echo," to access the PBX extensions and functions.
- Give the B:6 Attribute to all of the Telecenter lines that go to the PBX. Otherwise, the system will treat these lines as outside trunks and not allow access to them by extensions with no outside-calling privileges (no B:1 or B:2 Attribute). The B:6 will also grant full PBX access to extensions with limited outside-calling privileges: unless the system knows it is dealing with a PBX line, it will apply any Prefix restrictions to PBX extension numbers.
- Store in Location 64210 the digit or digits used inside the PBX for outside access (see the TCIV ***Programming*** manual, KI-1584). Otherwise, once a restricted line gains access to a PBX, it might be able to make unlimited outside calls.

Console Remote Ring

This software provides a new option for annunciating Console calls at remote locations. Heretofore, incoming calls to the Console could only be annunciated via the Consoles internal "Sonalert®" device. Now it can send a single and double ring to a small transducer, such as a Sonalert.

Connect the transducers to MI0 pin ***b:20*** or ***b:22.*** These pins cycle high and low when the Console is ringing, simulating a double ring with 12-volt logic for outside calls. Their 12-volt output can drive a low-power transducer, LEDs, or a small relay.

To activate this function, add "256" to Location 64206 for pin ***b:20*** or "5 12" for pin ***b:22.***

Important: Locations 64202, 64204, and 64206 can direct various functions to MI0 pins ***b:20*** and ***b:22.*** In any system, only ***one*** function should allowed for each pin.

GR2 Graphics

All interconnect lines, including AAl, DIL, and DISA, can now have their activities fully represented in the GR2 Graphics Display. The display can show when these line types are active (in communication, ringing in, or on hold). To include them in the display, set Location Codes 642 16 and 64208 as explained in the Telecenter Program-***ming*** manual, Kl-1584.

Bug Fixes

Console **False Hold**

Previously, pressing an unused, unprogrammed Direct Access Key on a TC4400 Call Control Console could set a hold (and its accompanying 30-second beeps) that could only cleared by resetting the system. Now unprogrammed Direct Select Keys will remain dead until they are programmed.

Console **Dialing Out**

Until now, the TC4400 Call Control Console could not fully access interconnect lines if its audio line did not have the "B:2" attribute but the interconnect line did. Now the Console is not affected by this attribute on its audio line.

#73 Diagnostic

Your test phone's display will now continue to show the link to which you are connecting and disconnecting idle LLM lines. Heretofore, each time you pressed "4" to disconnect a line, your display would revert to showing the test phone's link. This new method makes it easier to test individual links.

The system will continue to follow the older procedure when you connect your test phone to an active multi-link line (one already connected to a link is not affected). When you connect to an extension, your test phone is automatically moved to the linkbeing used by the selected line; when you disconnect your test phone, it will return to the link it was on when it began the diagnostics. Your display will show the other link when your phone moves to it, and its own link when it moves back there.

Version 102 Changes (Checksum 9890; Release Date 1 /10/89)

ENHANCEMENTS

1. You can prevent the transference of a call from one outside line to another: enter an odd number (e.g., "181") in Location Code 64098 (disconnect-delay time). This will also prevent a user from tying up two outside lines (e.g., by accidentally hook-flashing after talking to one outside line, and then making a call via a second outside line). ***See*** the programming manual, KI- 1584, for details.

2. The system now audibly indicates whether you hookflashed- or disconnected. A successfully initiated hookflash (a time period less than the programmed disconnect time at location 64014) produces a stutter (interrupted) dial tone, followed by the regular steady **dial** tone. An unsuccessful hookflash attempt (or disconnect) produces only the steady dial tone, without the stutter. See XI-1585 for additional details.

3. It is now possible to place a caller on hold, call a speaker or make a page, then return to the caller without creating a conference with the speaker or the page. Instead of hook-flashing after the call or page, hang up: the system will disconnect the party you called (or the page) and the original caller's line will ring your phone again. See the operations manual, XI-7585, for details.

4. For troubleshooting, you can now instruct the system to expand its log of the system activities; then, should a problem occur, you will have a more detailed record of what the system was doing at the time. Entering "8192" at Location Code 64012 will add these codes to the log:

Code	Explanation
$p23_15	Line 23 started ringing; this action was initiated by Line 15 (a DIL, AAI, DIA, or regular Administrative Phone.
-p14	Line 14 hung up.
+p13	Line 13 went from ringing to off-hook.
!p12	Line 12, which is AAI or DIL, has detected an incoming call.

See the troubleshooting manual, XI-1586, for details.

5. The normal mode of the TC4400 Console is to limit incoming calls to a single audible ring while the attendant is busy on another line; when the user hangs up, the Console reverts to continuous ringing for any waiting calls. Now you can allow continuous ringing even while the Console is in use: add 32768 to the amount entered in Location Code 64224 (Console audio line). See the programming manual, Kl-1584, for details.

6. If an Administrative Phone places an outside line on soft hold (intentionally or inadvertently) and then hangs up, the trunk will immediately call that phone back. After one ring, the trunk will be disconnected (a key phone may ring more than once). In Version 100, the outside line would ring the Administrative Phone for the duration of the time-out period and then would ring the Attendant Phone. See the operations manual, KI-1585, for details.

7. The keep-alive process now includes an immediate-disconnect option. After the keep-alive warning beep sounds, dialing "0" will immediately disconnect the caller's line. This immediately frees the VCM for call-ins or paging, and can prevent the system from picking up unwanted signals from a PBX during the time-out period. Dialing any other digit after the warning beep will reset the time-out period, as always. See the interconnect planning manual, Kl-1582, for details.

#73 Diagnostic Changes

See the troubleshooting manual, KI-1586, for detailed information on the following:

1. The general input-port hexadecimal data has now been replaced with the following simplified symbols (similar to those used in the "T6" program:

Prompts	Function
+, -, or N	LLM-line status
R, G, or N	"T" terminal status
V	VCM activated

2. Dialing "9" now turns on a five-second reference tone that alternates with five seconds of silence. This signal will continue until any other digit is dialed.

3. The main system can be blocked from sending dial tone, call-ins, or other system activities to an inactive LLM line so that the latter can be tested without interference. Simply press a connect key (l-3) or disconnect key (4-6) to start the "IOMARK" procedure for the displayed Physical Number; this will block the LLM line from the system's active-list record.

Note: The only way of sustaining the IOMARK record is to press a connect key (l-3) before moving on to another displayed Physical Number. Hanging up will delete the IOMARK record for the displayed Physical Number. To eliminate all IOMARK records from the system (and thus prevent the continued blocking of normal operations on the specified LLM lines), press the ***Reset*** button after exiting the #73 diagnostic.

Bug Fixes

1. When a DISA (Direct Incoming System Access) line times out, it will receive another dial tone before it is disconnected.

2. Receiver "0" can now be locked out by adding 16384 to Location Code 64012. See RI-1584 for details.

3. The service-request logic for E&M (Ear and Mouth) interfacing between systems has been revised so that the originating system controls the disconnect. This will prevent system lock-up. It functions now as it originally did in Version 14 software.

4. An Administrative Phone will not ring when it has placed a caller on soft hold, begun dialing another number, and then hook-flashed. Eliminating the ringing makes it easer for a user making a transfer to recover from a mis-dial and return to the caller.

Version 16 (Checksum 445B; 1/89)

A special version of the current software is available for older CPUs, which use five or six EPROMS (CPU2 uses only two). Version 16 includes all of the bug fixes and enhancements (except support for the TC4400 Console) of Version 102. It can be purchased as a six-chip set, Model 955 1 Software. This kit includes a piggyback socket for CPUs with five EPROM sockets.

Version 100 Changes (Checksum OEF9; Release Date 7/1/88)

Enhancements

Call Control Console (TC4400) support was added, including the following items not described in the present TC4400 Console manual (KI-1559A):

1. Remote answering of Console calls is now done just by dialing the Architectural Number stored for the console audio line. It is no longer necessary to wait for the busy signal and dial * as stated in the initial console manual. Single-digit dialing can also be used if desired.

2. Whenever a Direct-Select key is pressed twice in a row, the console is sent a beep command from the TCIV. This can be used to verify communication between the console and the TCIV in case of problems.

3. The Console generates a *remote* hook flash when you press a trunk key again after answering. This may be required in some centrex and PBX applications. A beep will also be heard at the Console when this feature is used.

4. Repeat Single-Button Dialing from the TC4400 console is allowed. If a staff call-in is answered from the console, then a subsequent call-in may be answered by pressing * again. Repeat single-button dialing from the Console is not affected by the 64106 Location Code, which can be used to limit the receiver time allowed for this function.

Bug Fixes

1. Until now, if you hook-flashed while you were talking to a speaker and then hung up, this stranded a link. Repeating this often enough could leave the system with too few active links to carry the required traffic. This has been a rare occurrence, however, because any stranded links are reclaimed whenever the system is turned on, reset, or even left on when no lines are active (off-hook or calling in). A line remains "active" when a phone is left off-hook or if there is a short on an unused line.

2. A caller who was transferred to ring another line could be disconnected if the person who made the transfer hung up or hook-flashed too long. Now if the transferer hangs up, his phone will ring again, indicating that the caller has been transferred back.

3. The MTG-100 could sound continuously when (a) two lines requested it simultaneously or (b) one user hook-flashed and re-dialed the MTG.

4. The ring programming is now compatible with the 48-volt hybrids (TC415 1). The previous version could stop after one or two rings.

5.A Link count-down function has been added to check for stuck interconnect trunks caused by obscure software defects. You can now use the #73 diagnostic to listen to each trunk in turn for either talking or central-office dial tone.

6. Call-ins with B:34 (not using resistor call-in) had a problem such that if a resistor call-in did occur due to noise, etc., it would be stored in system memory and block any more call-ins of the same, or lower priority level. Such call-ins do not show in any display but continue to block valid call-ins from affected rooms until the system is reset. Now call-ins not directed to any display are not stored or displayed.

7. Prevent possible stuck receiver which could occur when phone 1 calls phone 2, and then phone 2 hook-flashes or hangs up and starts new call before the first transfer is complete. Secondary transfer requests are now ignored.

8. A single-link staff phone left off-hook used to block communication to it and all other single-link phones until it was hung up. Now if a single-link phone is alone in a link for five seconds, it is disconnected. A call-in then occurs, as usual. Answering this call-in will renew the stuck situation. However, there is now a remedy: dial ## and the staff location: this forces speaker-only communication so that the administrator can request, "Please hang up your phone," or hang up and temporarily ignore the ensuing call-in (which then serves as a reminder that there is a phone off-hook in that room).

9. If someone did not want to accept the transfer of an outside call and then hung up at the same time as the person who attempted the transfer, it was possible that the caller would be transferred to ring the refusee's phone.

Paging Functions Reworked

A second person dialing the same paging function, now receives a busy signal instead of being queued. Queuing still applies when the second person dials a different paging function of the same or a lower priority level. The priorities are as follows:

1. Fire Alarm (USR2 126 System)
2. Emergency Page from MCI2 10
3. Time Zone
4. All-Page #00 / Console Page
5. Zone announce #01 through #08
6. Tones #11,#12,#13,#14 /external MTG
7. VCM intercom

If a lower priority function is overridden, the user will hear the announcement in effect until it ends, and then be automatically restored with a signaling beep.

Diagnostic Functions

1. MONITOR: change made to the xon/xoff protocol. Xoff is still ^S, but any key can serve as xon. This prevents

a problem where someone could accidentally hit ^ S and not realize that he has to hit ^ Q to get TCIV talking again.

2. Change made to DTMF monitoring so that extra characters From a previous user cannot be inserted in front of a new user's dialing data. This prevents irrelevant characters from being reported by the call-logging function.

3. Main Loop Vector (Hook): The main loop calls the routine located at FF6AH every time the main loop is executed. The EEPROM location is initialized to the value of the RET instruction (C9H) whenever the TCIV is reset.

4. #76 EXECUTE TRAP FUNCTION: when #76 is dialed and the trap vector is non-zero, pressing a numerical key (O-Y) will cause the function located at the trap vector location to be executed. The value of the key is pushed on the stack as a parameter. Subsequent presses of the keys 0-9 will act in the same way until the controlling line hangs up.

Version 14 Changes (Checksum 5AB5; Release Date 12/8/87)

Important

1. The PC diagnostic program must be updated to work with version 14 software because of the change explained under item 5 in "Diagnostics." Architectural programming functions are not affected. This will be corrected in a new version of the Diagnostics.

2. Some new attributes have been defined which would have been ignored in version 12 but will have an effect in version 14. When upgrading, you will have to verify proper settings. See items 1, 4, and 6 under "New Features," and item 2 under "Diagnostics."

New Features

1. Incoming calls directed to an individual phone Lines can be queued when the called phone is busy. ***Wait/Q Bit B:*** **7** can be set on the DIL lines to enable this feature.

2. A call forwarded to a busy line or to a disallowed line will automatically be reconnected to the original party. A second hook flash is no longer required.

3. The acceptable minimum hook flash time was reduced to increase hook flash reliability (now fixed 250MS was 400MS).

***4.** Intercom Restriction. The Intercom Channel can be restricted so only authorized phones can access the speaker circuits for the intercom function. Authorization is the same as for the special page authorization.

The Intercom restriction applies in the following cases:

a. Speaker only.

b. Speaker with Single-Link Staff Phone.

c. Multi Link Staff Phone with call speaker first and phone on-hook.

d. Administrative phone with associated speaker and call speaker first.

The Intercom restriction does not apply in the following cases:

a. Multi Link Staff Phone without speaker.

b. Multi Link Staff Phone with speaker if phone is off-hook.

5. Time Zone annunciation has priority over All Page.

*6. Restricted prefixes may now be made to apply within selected area codes. The same set of allowed prefixes that is used for local dialing can also be made to apply within another area code by adding 32768 to the area code when it is stored in one of the locations, 65280 through 65284.

Note: 800 **numbers are always allowed without** prefix restrictions. Dial one access to long distance is assumed. Dial zero is not allowed on restricted lines.

7. Remote stations programmed for "speaker first" may be called "ring phone first" and vice versa by using the reverse function. Dial ## and the extension number.

This works with the following combinations:

- Multi Link Staff Phone with speaker.
- Administrative Phone with speaker.

All calls to Single Link Staff Phones with speakers go to the speaker first since this type of line does not ring.

Bug Fixes

1. Abandoned Calls: Administrative Phones left off-hook will be disconnected and not take a up a link.

2. Statistics: SCAN OUT (57346), ADMIN CALLS (57348), and MAX LINKS (57358) statistics could be incorrect in some cases of high traffic. Statistics are now accurate under all conditions.

3. Hook flash reliability increased: Installed more efficient algorithms to conserve CPU time and speed up hook status sampling in main loop.

4. Graphic Display Function: Graphic information to TM432s was being sent twice, slowing response time to a call-in. Information is now sent only once.

5. Phantom Ringing: Hook flash detection is now defeated while dial tone is present in phone. This eliminates erroneous ring backs.

6. One-Digit Dialing (64014-64034) using rotary hunt to trunks could cause some established calls to be lost when another person dialed out (e.g., Dial "9").

7. Phantom Interconnected Calls: If an incoming trunk hung up before being serviced by the attendant,the trunk would continue to ring the attendant's phone for another 10 seconds. When the attendant phone was answered it would get dial tone from the central office trunk. A 10-second disconnect delay has been eliminated in the Telecenter system. The Key System Unit will now release 10 seconds sooner when the outside caller hangs up.

8. New Scan algorithm has more immunity to noise and reduces wasted CPU time.

9. RAM now initialized to zero except statistics when reset button is pressed.

10. All references to the Receivers were modified so that the Operating Receiver is held until no longer needed by the calling phone. Previously, it would have been released after dialing the third digit and brought back again for a busy signal or a disallow tone to the calling

phone. This could lead to complications when no Operating Receiver is available before the calling phone hangs up.

Diagnostics

1. Statistic: Changed definition and name of "SWFLAGS" to "Receiver Faults" (57362). It now shows the number of times the Operating Receiver was denied to a requesting phone.

2. Receiver monitoring is software-switchable (add 8192 to Location 64012). Here are sample messages:

Ap101: ***A*** indicates the first Operating Receiver (B would indicate the second Operating Receiver was connected to physical line 10 1).
A2: The caller connected to Operating Receiver 0 dialed a 2,
A3: and a 3,
A4: and a 4.
a: Operating Receiver 0 disconnected.
Ap101: 101 has the same Operating Receiver again.
Bp91: 91 received the second Operating Receiver.
B123: **91** dialed 123 very fast, or the CPU was delayed and got all three digits in one visit.
b: Operating Receiver ***B*** is disconnected.
A9: 101 dialed 9 probably for an outside line.
a: Operating Receiver ***A*** released.

This data can be collected and time-stamped by a basic program to get an idea of the sources and nature of activity in your system. Other serial port functions should be disabled to prevent confusion (e.g. Call-in logging).

3. Link-count and supervisor-count algorithms improved. The TCIV must keep an exact count of the number of connections and supervisors in each link; otherwise links may become unavailable or trunks may become stuck on until reset. Certain high traffic situations were able to confuse Version 12 algorithms.

4. A bug was eliminated where a binary 0 transmitted to the serial input could cause system resets. This was believed to be related to resets occurring when using modems on noisy lines.

5. The monitor "G" function was changed to ^ G. Some modems send messages such as "RING." The "G" means "G" to the TCIV and will cause a watchdog reset. When a ^ G is typed, a regular "G" is echoed. (^ G refers to the ASCII code sent when you hold down the "ctrl" key while typing a "G.")

6. Ring algorithm was modified to conserve CPU time and to improve the probability of stopping ring between the first and second ring of a double ring.

Version 12 (Release Date 12/86)

Software Changes

1. The Scan routine was made more efficient. It now waits 100 microseconds instead of 50 microseconds. This helps in scanning larger systems by giving an individual station time to respond (otherwise, the system would have to complete an entire scan before it could attend to the station's response and act upon it).

2. The Scan routine debounces SC25 and LLM signals separately. This prevents some types of faults on one bus from interfering with the receipt of signals from the other bus.

3. DISA (DIA) lines can now receive remote hook flash. This may be necessary in some TCIV-to-TCIV connections.

4. Call-in logging, page logging, trunks or lines busy, and call-in-present LED drives are available:

Trunks and lines "busy" range for MIO Terminal B20: set at ***64202.***

Trunks and lines "busy" range for Terminal B22: set at 64204 (disable "trunks busy" with "0" if **you** are using the MI0 terminals for "call-present").

Call-present and serial-logging control: set at ***64206.***

The numbers listed below are bit numbers:

b0: Enable ***call-in logging.***
b1: Enablepage ***logging.***
b4: MI0 #B20 will show normal calls to LCD 1.
b5: MI0 #B20 will show priority calls to LCD 1.
b6: MI0 #B22 will show normal calls to LCD 2.
b7: MI0 #B22 show priority calls to LCD 2.

fnzportant: Do not program the same MI0 #B terminal for "trunks busy" and "call-present."

For call logging, the Architectural Number of the answering administrative phone is also sent to the serial port.

5. Hook-flash detection time was increased from .1 to .4 seconds. Automatic ring-back (Location Code 64222) occurs when you flash the hook and hang up. Automatic reconnect occurs when you flash the hook, wait for dial tone, and time out.

6. SBD (single-button dialing) voice-trigger immunity was increased.

7. The alarm no longer sounds when you turn the system on.

8. Graphics enhancements:

Specify the start node for TM432 modules.

Speed up response by enabling the transmission of only the required number of nodes.

Display both Type 1 and Type 2 call-ins.

Provide additional "in use" drives: the MI0 buffered drive, and 2 unbuffered drives. These drives represent "in use" only in association with a specified range of administrative phones. This permits control of closed-circuit TV, or the use of a graphic panel to show the location called by "my" phone.

9. Attendant recall location was assigned to 64222.

10. The receivers can be locked out after the system is reset:

Location Code 64012 and b15 lock out Receiver 2;
Location Code 64012 and b14 lock out Receiver 1.

11. The Hunt function spans DIL (DID) and AAI lines.

12. New PBX access codes were created by setting Location 64210 to ***digit 1 + digit 2 x 256.*** The enabled interconnect lines will implement long-distance or prefix restrictions if you first dial digit 1 or digit 2. This indicates selection of an outside line from a PBX.

13. Any line receiving a transferred interconnect call will ring twice.

14. **Invalid** Architectural numbers are displayed as "????" instead of as an incorrect number.

15. ***Option: You*** can use Attribute B:8 on interconnect lines to enable Remote-Service Request. B:8 is no longer available for single button calls: Attribute B:7 of DISA (DIA) now is used to enable SBD calls instead of B:7 and B:8. The previous version used a timing test which could lead to errors in special cases. Setting B:8 can prove helpful when using a telephone without a TC4171 (COA) to simulate the effect of an outside call, e.g., for a demonstration.

Important: You must reprogram this item when upgrading from an earlier version.

Version 10 (Release Date 7/8/86)

Software Changes

1. Link lockout and line lockout. Set bit nos O-15 of Location 64196 to block usage of the corresponding link. Remove all of the ***A*** attributes to prevent the use of the corresponding telephone line trunk.

Incoming calls from a trunk blocked in this way will be ignored by the system. Callers will hear a constant ringing. In some cases, this maybe prevented by shorting the open C.O. line at the interface (if this is permitted by the telephone company).

Link lockout does not take effect until after system is reset.

To set bit numbers, add these values to the specified location code:

b0 1 ***b6 64 bll 2048***
bl 2 b7 128 ***b12 4096***
b2 4 b8 256 b13 8192
b3 8 b9 512 b14 6384
b4 16 b10 1024 b15 32768
b5 32

2. Enable or disable non-owner use of DID (DIL) lines (clear B:3 to enable non-owner use).

3. Incoming interconnect calls are signaled by a double ring.

4. Distributed single-digit dialing: To prevent one or two DIL lines from being tied up, you can instruct the system to connect each outgoing call to the next-highest numbered line in the group. For example, the first call might go to Physical Number 10, the next to 11, and so on; after the highest-numbered in the group has been used, the system will begin again with the lowest-numbered line. Without this setting, the system will always connect the call to the lowest-numbered available line in the group.

"Note 2" after Location Codes 64016-64034 (page C14) tells how to set this distributed use of the lines.

5. Special page queuing and preannounce tone.

6. "Trunks Busy" lamps 1 and 2. Set Locations 64202 and 64204 to (1024 x ***N)*** + ***PHYS.*** (subtract 1 from the number of lines in the group, multiply the result by 1024, then add the lowest Physical Number in the group). With these settings, the LED driver from the MI0 will be on whenever all of the trunks in the group are busy.

7. If a DIL (DID) line is busy and Night Answer is enabled, the night-answer annunciator will be activated for DIL lines.

8. Room check-in ([#] [2][**3]** ***hang up)*** sends the room number to the serial port.

9. If a call is not answered at another phone, you can answer it at your own phone by dialing the ringing phone's number and then dialing [*] after you hear a busy signal.

Note: You cannot take the call from a phone programmed with a hunt bit. Since a phone being rung is "busy," dialing its number will send your call to the next available line in the hunt group.

10. By pushing the ***Trap*** button, you can execute the custom program. The address of the custom program must be stored at the Location EEPROM. When not in use, the Location must be set to zero.

11. If A:66 is grounded, #74 (RP2 adjust) and #73 (line diagnosis) halt the system. This makes static measurements of ***A, B,*** and MPX possible.

12. To disable single-digit dialing, Codes 64016-64034 must be set to zero instead of 1,000.

Important: You must reprogram this setting when upgrading from an earlier version.

13. Vectors that point to connect, disconnect, and relay were added. These are used by the remote diagnostic program.

14. #73 can monitor ongoing calls and delete active-list records. In Version 8, using #73 on LLM lines would disrupt communication when connecting and disconnecting to lines in use.

15. MI0 Relay 4 now is activated with Relay 1.

16. The EEPROM check sum is now correct.

17. The prefix (#96) now works properly (toggles).

18. Data collection works properly.

19. Incoming DISA (DIA) callers are prohibited from doing any functions requiring the use of an LCD.

20. Call Pickup, Special Page, and Distributed Single-Digit Dialing all use the same algorithm (1024n + m).

21. The system will always release links with calls made by SBD (single-button dialing).