ZETRON®

Model 3030 PSAP TDD
Product Manual

025-9193K

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IP networks by their nature are subject to a number of limitations, such as security, reliability, and performance. Anyone using non-dedicated IP networks, such as shared WANs or the Internet, to connect to any Zetron Products or systems should consider and is responsible for these limitations.

Compliance Statements

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.

This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

The Ringer Equivalence Number (REN) for this terminal equipment is 0.1. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices does not exceed 5.0.

Information on Disposal of Old Electrical and Electronic Equipment and Batteries (applicable for EU countries that have adopted separate waste collection systems)
Products and batteries with the symbol (crossed-out wheeled bin) cannot be disposed as household waste. Old electrical and electronic equipment and batteries should be recycled at a facility capable of handling these items and their waste byproducts.   Contact your local authority for details in locating a recycle facility nearest to you.   Proper recycling and waste disposal will help conserve resources whilst preventing detrimental effects on our health and the environment.   Notice: The sign "Pb" below the symbol for batteries indicates that this battery contains lead.

Safety Summary

STOP **Warning!** For your safety and the protection of the equipment, observe these precautions when installing or servicing Zetron equipment.

- Follow all warnings and instructions marked on the equipment or included in documentation.
- Only technically qualified service personnel are permitted to install or service the equipment.
- Be aware of and avoid contact with areas subject to high voltage or amperage. Because some components can store dangerous charges even after power is disconnected, always discharge components before touching.
- Never insert objects of any kind through openings in the equipment. Conductive foreign objects could produce a short circuit that could cause fire, electrical shock, or equipment damage.
- Remove rings, watches, and other metallic objects from your body before opening equipment. These could be electrical shock or burn hazards.
- Ensure that a proper electrostatic discharge device is used, to prevent damage to electronic components.
- Do not attempt internal service of equipment unless another person, capable of rendering aid and resuscitation, is present.
- Do not work near rotating fans unless absolutely necessary. Exercise caution to prevent fans from taking in foreign objects, including hair, clothing, and loose objects.
- Use care when moving equipment, especially rack-mounted modules, which could become unstable. Certain items may be heavy. Use proper care when lifting.

Release History

Release	Enhancements/Changes
Rev J 15 Jan 2009	• Converted from WordStar into MS-Word and reformatted to match the current manual template. • Revised graphics throughout. • Removed parts lists and schematics, moved assembly drawings to the Troubleshooting section.
Rev K November 2015	Add a new sub-section and a diagram indicating how the Model 3030 PSAP TDD device can be installed in parallel with a MAX Call-Taking console position, see *MAX Call-Taking Console Installations* on page *44*

Contents

Introduction

Overview of Model 3030

The Model 3030 PSAP TDD is the first Telecommunications Device for the Deaf (TDD) specifically designed to aid public safety answering points (PSAPs) in receiving calls from hearing or speech impaired people. In a typical installation the Model 3030 passively monitors each emergency phone call. In the event that it detects TDD tones, the unit will notify the call taker, send an answering message to the TDD caller, and provide a means for the call taker to view and send messages to the caller.

Other features which make the Model 3030 ideal for Public Safety:

- Panel-mount design eliminates clutter.
- Uses familiar PC-style keyboard which may be detached until needed.
- Wires directly to call taker's telephone, eliminating acoustic couplers which do not work with headsets.
- Provides a view of more characters than is typically found on most TDDs.

- May be used to interrogate silent calls for potential TDD call.
- Automatically adjusts to the parameters being used by the caller. This means that ASCII vs. Baudot detection is automatic, as well as adjustment to the caller's baud rate.
- Provides up to 12 "canned" messages which allow a call taker to systematically ask the appropriate questions.
- A logging port allows the entire conversation to be printed along with the beginning and ending times and date.
- Alternately the logging port may be used to attach to a Computer Aided Dispatch (CAD) system allowing the CAD terminal to become the TDD screen and keyboard. The built-in screen and keyboard port then become a manual back-up provision should the CAD system go down.

Training on TDD Call-Taking is Important

Thank you for selecting Zetron to provide you with equipment to handle your emergency service TDD calls. Our goal has been to develop TDD equipment that provides the greatest chance of establishing reliable communications between a hearing impaired caller and an emergency service call taker. This allows your call takers to concentrate more on the actual communication rather than the equipment.

Now that you have your TDD equipment, it is imperative that you have an ongoing plan to keep your call takers trained for receiving TDD calls. The Americans with Disabilities Act (ADA) does not regulate your technology or equipment but does expect a level of performance in handling TDD calls that is equivalent to the service provided to voice callers (see Title II, Part IV, paragraph 35.130.b.1 of the ADA). Thus, equipment alone will not meet the requirements of the ADA.

Deaf Culture

Communicating with a hearing impaired caller is not as simple as typing in plain English. As you can imagine, people who rely on TDDs have developed abbreviations for expediency. For example, "GA" (go ahead) prompts the other party to type.

Another aspect to take into account is grammar. Sign language does not use the same grammar as spoken language. Those who have been deaf from birth may be unfamiliar with English grammar.

Periodic Tests

Since the ratio of TDD to voice calls is very low, your call takers will likely need TDD training often. Many centers train by periodically calling their call takers with a portable TDD. This serves several purposes:

- It tests the center TDD equipment.
- It familiarizes the call taker with the equipment.
- If properly done, it gives the call taker practice at TDD etiquette and language usage.

Some centers use off-duty supervisors to initiate this test. Other centers arrange with other nearby centers to form a buddy system of mutual training. Still other centers use local deaf groups to aid in the training process. The latter method has the advantage of building good relations with the deaf community and aids in fulfilling the ADA requirement of including disabled groups in the self-evaluation process (paragraph 35.105).

Training Resources

Many organizations provide training manuals, videos, and classes. Here is a partial list of some national organizations that can help:

- Institute for Disabilities Research and Training, Inc. (IDRT), (301) 593-2690
- Telecommunications for the Deaf, Inc. (TDI), (301) 589-3786
- National Association of the Deaf (NAD), (301) 587-1788
- Associated Public Safety Communications Officers (APCO), (904) 322-2500
- National Emergency Number Association (NENA), 1-800-332-3911/(614) 622-8911

Specifications

Physical

Size:	4.25"W x 5.0"H x 10"D. Compatible with Motorola Centracom II or Zetron Series 3000 Rack Chassis
Display:	32 character, backlit, wide-view LCD. 4.9 mm character height
Keyboard:	Uses standard "Enhanced 101" AT-style keyboard
Options:	Keyboard, Printer Module, Handset-Interface

Electrical

Power:	12 Vac or 15 Vdc, 0.5 A maximum
Detect Alarm:	0.5 A, 30 Vdc relay contact closes upon TDD detection
CAD/Printer/ Time Sync port:	Serial RS-232 300, 600, 1200, 2400, and 4800 baud, 8 bits, no parity, full-duplex

9-pin "D" type female socket

Time Sync Format:	Spectracom Once-per-second RS-232 Data Format 0 or Format 1 and NENA-04-002 Once-Per-Second RS-232 ASCII Time Code

Signaling

Baudot:	Standard code, 45.5 baud or international code, 50 baud. Automatic adjustment to caller's baud rate & code
ASCII:	ASCII code, ANSI protocol, Bell 103 at 110 or 300 baud, Bell 212A at 1200 baud. Automatic adjustment to caller's baud rate. Automatic adjustment to caller's parity when used with 7-bit data. Receives 8-bit data with any parity but may not respond with matching parity (1200 baud receives only 7 bits with parity or 8 bits with no parity). Answer or originate mode, half-duplex
Receive Sensitivity:	-35 dBm minimum
Transmit Level:	-9 dBm maximum

Compliance

FCC	Complies with Part 15 Class A, and Part 68
FCC Registration:	EYBUSA-65849-DT-N, 3.0B REN
NENA	Complies with NENA-04-001 when used with the Model 3031 Printer, Model 3010 ALI Display or CAD system

TDD Applications Questions and Answers

This section discusses some important issues about providing telephone emergency services to users of TDDs. The issues are discussed in a question and answer format.

The Law

Question:
What does the Americans with Disabilities Act (ADA) say concerning telephone emergency services?

Answer:
Title II, Part IV, Paragraph 35.162 states: "Telephone emergency services, including 911 services, shall provide direct access to individuals who use TDDs and computer modems."

Paragraph 35.130.b.1.ii, paraphrased, states that public entities must provide the same aid, benefit or service to the disabled and non-disabled equally.

Paragraph 35.130.b.1.iv, paraphrased, states that public entities must not provide different or separate aids, benefits or services for the disabled unless the separate services are as effective as those provided to the non-disabled.

Paragraph 35.105, paraphrased, states that a public entity shall periodically evaluate its services, policies and practices, and provide an opportunity to interested persons representing individuals with disabilities to participate in the self-evaluation, and maintain on file details of the evaluation for public inspection.

Question:
How does the ADA affect PSAP operations?

Answer:
Here are some clarifications of the ADA:

1. "Telephone Emergency Services" applies to basic emergency services (police, fire, and ambulance) that are provided by public entities, including services such as emergency poison control.

2. "Direct Access" means telephone emergency services must not rely on outside relay or third party services. TDD and computer modem users may directly dial the telephone emergency service. If there is 9-1-1 dialing available, the TDD or computer modem user is permitted to use the 9-1-1 system rather than a dedicated 7-digit number. However, if only 7-digit dialing is available to access the telephone emergency service, then a separate dedicated non-voice telephone number is allowed if properly advertised.

3. The term "computer modem" has many different connotations and potentially encompasses many non-voice formats. Most standard computer modems fall under the loose category of "ASCII" but may still use a variety of protocols, such as Bell 103, Bell 212, CCITT V.21, etc. Due to this confusion, the federal government has clarified that "Until it can be technically proven that communications in another format can operate in a reliable and compatible manner in a given telephone emergency environment, a public entity would not be required to provide direct access to computer modems using formats other than Baudot."

4. The government has clarified that TDD and computer modem callers are not required to announce themselves when calling a telephone emergency service. Thus operators should recognize that "silent" calls are potential TDD or computer modem calls and should be handled accordingly.

5. Calls from hearing and speech-impaired people must be given the same level of service as the general public. This means that a non-voice call should only be transferred if a voice call would be transferred.

   A non-voice call should be handled by the same qualified personnel as a voice call would receive. The time taken to begin communications with a non-voice caller should be approximately the same as a voice caller.

6. PSAPs must perform a documented self-evaluation of its services and include disabled persons or organizations in this review.

Question:
Does having the Model 3030 guarantee compliance with the ADA?

Answer:
No. We feel that the Model 3030 gives you the best chance of establishing reliable communications between the TDD caller and your center personnel. It allows you to concentrate on proper procedures and information exchange rather than on technology (like modes, etc). Training and procedures probably play a bigger role in compliance than

equipment. An organization called Telecommunications for the Deaf Incorporated (TDI) can be a big help in training. The voice phone number for TDI is (301) 589-3786.

Question:
How can one find out more about the Americans with Disabilities Act?

Answer:
Contact the Department of Justice, Civil Rights Division, Coordination and Review Section, P.O. Box 66118, Washington D.C. 20035-6118. Alternatively, you may call the ADA hot line at 202-514-0301. You are encouraged to obtain a copy of the ADA since it is not possible for us to cover all aspects of the law that may effect you. Be sure to ask for Federal Register 28 CFR Part 35, and the ADA Title II Technical Assistance Manual. Note that the ADA affects many other aspects of public entities, such as public accommodations, transportation, and telecommunications.

Baudot versus ASCII

Question:
What is the difference between Baudot and ASCII?

Answer:
Strictly speaking, Baudot merely defines the 5-bit code that was popularly used in the 1940s, 1950s, and 1960s. ASCII defines the 7-bit code that is currently in use today. TDDs traditionally have used the Baudot code and all known TDDs today still use Baudot. However, a growing number of TDDs now have the option to add the ASCII format. In addition, many hearing and speech-impaired people are using computers for their communications. Most standard computer modems use the ASCII code.

These are the differences that have the largest impact on telephone emergency services:

1. ASCII computer modems dial out in an "originate" mode. In originate mode, no tones are sent until the answering end sends an "answer" tone. Thus it does not matter what the caller types, tones are not sent until the answering end responds with a tone. When the answering party responds with the correct tone, tones are continually sent by both parties. The call terminates when either party stops transmitting its tone. The other party then automatically disconnects. In Baudot, tones are sent when and only when a key is typed. There is no verification that the other end is on line or receiving.

   This means that ASCII calls are always received with silence, even if the caller is typing. Once the answering party has sent back its tone, if the tone is ever interrupted (by placing on hold or transferring) the caller's modem is disconnected.

2. Most communications software for computer modems allows many variables to be set. One variable is called "carrier detect time out". This is the maximum time that the computer will wait after dialing for the answering party to send back its

"answer" tone. If this time is exceeded the computer will automatically disconnect and perhaps retry. Baudot machines typically do not have any specifiable timeout and these devices will generally wait as long as the patience of the user allows.

This means that ASCII calls must be "interrogated" within a short time (typically 45 seconds but may be more or less depending on how the user has set up his computer). This places importance on quickly interrogating silent calls. It also means that ASCII calls placed into the queue of an automatic call director (ACD) are at risk of timing out.

Question:
Is a PSAP required to receive calls in ASCII mode from TDDs and computer modems?

Answer:
Not at present because there is some question as to the reliability and compatibility of ASCII with given telephone emergency environments. However, work is being done to establish standards and modifications so that ASCII can be made more universally reliable and compatible by eliminating most of the problems traditionally associated with the ASCII format. When this is completed, you will then most likely be expected to handle ASCII calls.

Zetron is one of the manufactures involved in establishing these standards. The Model 3030 is already establishing itself as the industry standard for telephone emergency service TDDs. However, in the event that the Model 3030 is not compatible with the standards that emerge, Zetron will make available upgrades so that existing units may comply with the standards.

Question:
Will the Model 3030 receive calls from all ASCII computer modems?

Answer:
No. Such a product would be formidable in cost even if it were technically possible. As we stated before, the ASCII code may be found transmitted by many different protocols (Bell 103, Bell 212, CCITT, etc.). The Model 3030 contains the Bell 103 and Bell 212 protocols which means it can receive calls from most "Hayes compatible" modems sold in the United States. The 3030 handles baud rates of 110, 300, and 1200 baud. Fortunately, most "Hayes compatible" modems that are of higher baud rates will automatically switch their baud rate down to match the 1200 baud when they hear the ASCII interrogation of the Model 3030. Yet there are a few modems which do not automatically "auto-baud". For this reason, if you are going to offer ASCII communications, it is prudent to provide a notice in the "Emergency Number" section of your local phone book such as "Hearing & speech impaired callers using ASCII computer modems should use 300 baud, 7-bits, even-parity, half-duplex." Using these default settings of the Model 3030 will avoid the potential of loosing the first couple of characters while the unit determines the caller's settings. It also ensures that even 300 baud-only modems will still be able to communicate.

Question:
Will a commercial, ASCII-equipped TDD receive calls from any ASCII computer modem?

Answer:
Most likely no. Most commercial TDDs (including the Superprint ES) have ASCII for the purpose of communicating with other TDDs equipped with ASCII and for calling computer bulletin boards. However, they are not set up to receive calls from ASCII computer modems (such as "Hayes compatibles"). The major problem is that the answer tone of commercial ASCII-equipped TDDs is not long enough for originating ASCII computer modems

How the Model 3030 Operates

Question:
What does the Model 3030 do if TDD tones are heard when a call is answered?

Answer:
Here is a detailed sequence of events:

1. The Model 3030 "lights up" showing the caller's mode (Baudot or ASCII).
2. The Model 3030 turns on its "Alarm" contact which may be wired to external lights or buzzers.
3. Within the first few characters typed by the caller, the Model 3030 is analyzing the caller's data to determine the baud rate and parity being used by the caller.
4. At the first pause of caller typing, the Model 3030 sends the "canned" message specified by you at the same rate and parity being used by the caller.

Question:
What happens if silence is heard when a call is answered?

Answer:
Silent calls may be a TDD call either because the TDD user is using Baudot and is not yet typing or because they are using ASCII. This is what should be done:

1. Start the Model 3030 interrogating. If the Model 3030 is wired as an extension this is done by transferring the silent call to the TDD extension. If the Model 3030 is wired to the call taker's phone, this is done by pressing one of the three message buttons on the front of the unit.
2. The Model 3030 listens for tones.
3. If no tones are heard, the unit begins by sending the ASCII Answer carrier tone to see if the calling unit will respond. ASCII is tried first to minimize the delays to the potential ASCII caller since their carrier detect timer is running.
4. If the calling unit responds, the unit "lights up" showing the ASCII mode. The unit also turns on its "Alarm" contact.

5. The Model 3030 then sends the pre-programmed "canned" message.

6. As the caller types the first few characters, the Model 3030 determines the baud rate and parity.

7. If there was no response to the ASCII Answer carrier (step 3) the unit immediately begins sending the "canned" message in Baudot.

8. If the Baudot TDD user responds to the Baudot message the unit "lights up" showing the Baudot mode. The unit also turns on its "Alarm" contact.

9. If there is no response to the interrogation then the unit automatically disconnects from the line when the pre-programmed timeout expires or when the operator presses the unit Reset button.

Telephone Interfacing

Question:
Will the Model 3030 interface to all telephone systems?

Answer:
Most likely yes. We have not found one that cannot be interfaced. Interfacing may take place in one of three ways:

1. Plug into a dedicated phone extension (see next question).

2. For older electromechanical, multi-button sets and some electronic sets (such as "1A2s" and "Call Directors"), the Model 3030 may be wired directly to the set's internal network.

3. For digital and some electronic phones, the Model 3030 will require the Handset Interface which plugs in series with the telephone handset or headset. In addition, because we avoid using the acoustic handset coupler used by commercial TDDs, we are easily able to work in headset environments.

Question:
Is one Model 3030 needed for a PSAP center or is one Model 3030 needed for each call taker?

Answer:
It depends on your system and the potential for liability. Obviously having one TDD for each operator places you at the least liable situation since you can handle as many TDD calls from disabled people as you can handle voice calls from the general public (which complies with the ADA equivalent services requirement). Yet your budget may not allow this. Here are some alternatives:

1. If your phone system allows you to transfer an emergency call to a dedicated extension, you may install one Model 3030 on that extension. Whenever a call taker receives a call that has a TDD tone or announcement, or silence, they may transfer the call to that extension. The Model 3030 will immediately pick-up the ringing extension and interrogates the call to verify that it is an actual TDD call. If

the interrogated call fails to send tones, the unit will automatically hang-up after a programmable period (typically 30-60 seconds). If the call is a verified TDD call, the Model 3030 will set off an alarm (which can be both visual and audible) notifying center personnel to man the TDD keyboard. The printer output shows the time & date of each interrogation and the result. The disadvantage of this method is that it no longer makes use of the ability of Model 3030 to automatically detect the TDD tones first heard by the call taker (i.e. the call taker must recognize TDD tones). In addition, if the TDD is in the middle of an interrogation, and another real or potential TDD call comes in, the call taker must wait for the first interrogation to end before the call can be transferred to the TDD. It is important to begin interrogation as soon as possible, preferably within 10 seconds, because some computer modems have a short carrier detect time out. By the way, although it is not good to transfer ASCII TDD calls once both carriers (originating and answering ends) have been established, it is all right to transfer them before both carriers have been established.

2. If you cannot transfer to an extension, then you may install the TDD at one call taker's position. In the event that a potential TDD call (or silence) is taken at another position, then the other call taker must have the TDD call taker pick-up the line and, if silent, perform an interrogation. The problem is that if the TDD call taker is currently handling another call, they must immediately hang-up the current call (or put it on hold) and handle the potential TDD call. Since silent calls can occur frequently, this may be very disrupting.

Question:
How can a TDD call be transferred to another center?

Answer:
Transferring Baudot calls is never a problem, but transferring ASCII calls will not work with commercial TDDs. However, the Zetron Model 3030 "F" does allow ASCII to be transferred. The problem is that for ASCII calls, once carrier tones have been established in both directions, any disruption of the tones (which occur when you place it on hold or transfer it) will cause the caller's TDD to automatically disconnect. The Model 3030 "F" (forward) is a special version of the Model 3030 that has two phone ports; one for receiving the public's TDD call and the other for dialing into a secondary answering point equipped with a Model 3030. Thus, if it is necessary to transfer an established TDD call to another center, the Model 3030 "F" will dial the secondary center and "forward" the TDD call through the original Model 3030 to another Model 3030. No transfer actually occurs. The TDD caller remains connected to the first Model 3030 and the second Model 3030. Call takers at both locations can be involved in the conversation and can see what each other is typing. By the way, Baudot TDD calls can be put on hold and transferred with no special equipment. However, handling TDD calls can be complicated enough without having to follow different procedures based on the caller's mode. Therefore it is best to treat all TDD calls the same.

CAD or Printer Interfacing

Question:
What advantages are there to interfacing the Model 3030 to a CAD system?

Answer:
The Model 3030 may operate as a stand-alone TDD as well as a TDD modem. Some computer-aided dispatch applications use the Model 3030 primarily as a TDD modem and as a backup TDD in the event that the CAD system goes down. The most popular way of using the Model 3030 from a CAD system is to bring up the TDD function by performing a "hot-key" sequence (like Alt-T). The CAD terminal screen and keyboard then become the TDD screen and keyboard. This has the advantage of seeing a full screen of conversation as well as having a completely familiar keyboard for typing without moving from the CAD terminal.

Question:
What does it take to interface the Model 3030 to a CAD system?

Answer:
First, your CAD system must have a spare RS-232 serial port capable of operating at 4800 baud. Second, the CAD system needs to have software to support the TDD. We have been contacted by several major CAD vendors who are writing interface modules for the Model 3030. If you maintain your own CAD software, *Appendix A: Baudot Code* on page *57* gives all the details on communicating with the TDD via CAD.

Question:
Is a printer needed for the Model 3030?

Answer:
Probably. As in all emergency situations, liabilities are involved. A printer will allow you to log the time and date of the beginning and end of each TDD call as well as the messages typed by both parties. Note that if you have a CAD system attached you cannot attach a printer directly to the Model 3030. In this situation, it is typical to have the CAD perform the logging, either to a data file or to its own printer.

Question:
Can any printer be attached to the Model 3030?

Answer:
Yes, as long as it is a serial RS-232 printer that can operate at 4800 baud. If it does not have a large buffer, the printer must support XON/XOFF flow control.
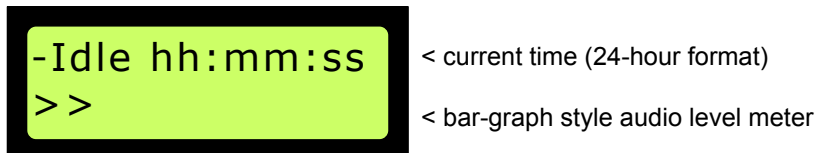
Operation

Front Panel

LCD Display

Idle (monitoring for TDD calls)

While the unit is monitoring for TDD calls, the display backlighting is off and the unit display looks like this:

```
-Idle hh:mm:ss
>>
```

< current time (24-hour format)

< bar-graph style audio level meter

The bottom line of the display acts like a "VU" meter showing voice activity. This is useful in verifying that the unit is properly connected. Whenever any voice activity is occurring, such as during a voice call, the bar graph on the bottom line should fluctuate.

When not in CAD Mode, the colons of the time display will blink if the unit is not receiving correct external synchronized time.

Interrogating Silent Calls

While the unit is interrogating a silent call for a possible TDD call, the display backlighting is off and the unit display looks like this:

```
-----ASCII------
--Interrogate---
```
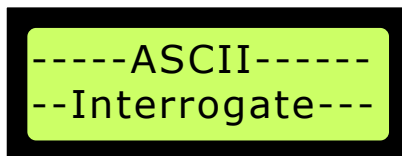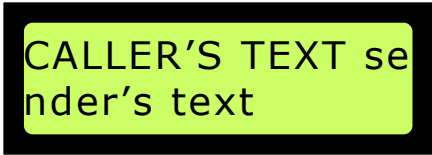
Interrogations begin in ASCII mode. If no ASCII carrier is heard, the unit reverts to Baudot mode. In either case, interrogation text is sent and the LCD display shows the text as it is being sent and looks like this:

```
message being se
nt.
```
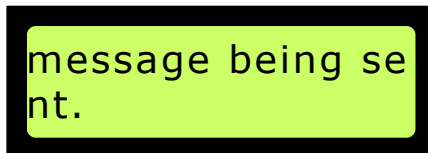
Connected With TDD Caller

The moment that the unit detects a valid TDD call, the unit display backlighting turns on and remains on. The unit display then looks like this:

```
CALLER'S TEXT se
nder's text
```

The display then shows the caller's message as it is being typed by the caller. The display also shows the text being sent to the caller as it is being typed by the call taker. The caller's text is always shown in upper case letters (capitals) while the call taker's text is always shown in lower case letters. Once the last position in the lower line is filled, the lower line is transferred to the upper line and a new line is started on the bottom line. The text is then filled on the bottom line from left to right.

Baudot/ASCII LEDs

While the unit is idle, both the Baudot and ASCII LEDs are extinguished. When the unit begins interrogation, it always starts interrogating in ASCII mode. While in ASCII mode, the ASCII LED is on. If the caller does not respond to the ASCII interrogation, the Model 3030 tries again in Baudot mode. While in Baudot mode, the Baudot LED is on. If there is no response to the interrogation in either mode, the unit returns to idle and both LEDs are extinguished. If the unit detects TDD or otherwise connects with a TDD caller, the mode of the user is indicated by either the Baudot or ASCII LEDs.

Message Buttons

These three buttons allow the call taker to send three different "canned" messages to an established or potential TDD caller (however more messages are available via the keyboard). Usually these buttons are labeled with an indication of the type of message it will send.

If any of these buttons are pressed before the unit detects valid TDD tones, the unit will perform an interrogation using the message text. If a message button is pressed after a TDD call is detected the unit sends the message only in the mode used by the caller. If a message button is pressed while a message is already being sent, the message being sent is terminated and the new message is immediately started.

Reset Button

Pressing the Reset button in any mode will always return the unit to the idle mode (display showing "Idle" time and audio level). While the Reset button is depressed, the display shows the software version number (x.xx) and a count of true TDD calls (yyyy) versus interrogations (zzzz). A dash (-) will appear between "x.xx" and "yyyy" if the unit is 1200 baud capable. The display looks like this:

```
 Model 3030  TDD
 Vx.xx yyyy/zzzz
```
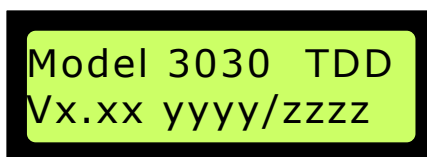
The counts are useful in determining the TDD activity through your PSAP. The counters are cleared by entering a value for auto-answer set-up. See *Set-Up* on page *31*.

Keyboard Jack

This connector is used to plug in a standard "Enhanced 101" AT-style keyboard. The connected keyboard must be operating in the "AT" mode (rather than "PC/XT" mode). The keyboard allows the call taker to type conversantly with the caller. It also allows the 12 "canned" messages to be accessed. It also allows the unit to be Set-Up (programmed). The keyboard need only be connected for one of these purposes. When the unit is idle, the keyboard may be disconnected.

While the unit is idle, typing an "S" will bring up the Set-Up menu. See the SET-UP section.

While the unit is idle, typing a "T" will force the unit to transmit TDD text, but first an interrogation is made.

While the unit is idle, pressing the "Alt-Insert" keys together will place the unit in the Baudot TDD mode. While the unit is in the TDD mode, pressing the "Alt-Delete" keys together will place the unit in the Voice mode. These keys may be used as a quick way to switch between voice and TDD modes during an HCO/VCO TDD call.

While the unit is interrogating or connected to a TDD caller, typing any valid character on the keyboard will result in the character being sent to the (potential) caller. As text is being typed by the call taker, the LCD display will show the text. If the call taker types an invalid character (not all figures are valid in Baudot mode), the unit will not respond at all. The unit ignores the keyboard cursor control keys; however, the numeric pad is operational.

Pressing one of the 12 function keys (at the top of the keyboard) will send a "canned" message just as if a front-panel message button had been pressed. The keyboard function keys F1, F2, and F3 are the same as front panel message buttons 1, 2, and 3.

Speaker

The speaker is located behind the front panel. The speaker provides a means of monitoring the telephone audio while the unit is interrogating or while the unit is connected with a TDD caller. Occasionally a voice call may be mistakenly placed to a dedicated TDD phone number, or a speaking person may try to help a TDD caller. The speaker allows the call taker to notice voice activity so that they may Reset the unit making the telephone handset live for a voice conversation.

Receiving a TDD Call

Common Dedicated TDD Extension

In this application, the communications center has one (or more) TDD(s) wired to a dedicated extension(s) that is accessible to every call taker so any call taker may transfer a suspected TDD call to the dedicated TDD extension(s) for interrogation.

When call takers receive a call that is either silent or has TDD tone, they must immediately transfer the call to the dedicated TDD extension.

The Model 3030 may be Set-Up to automatically answer a ringing extension after a preset number of rings (answer-rings). In this application, the Model 3030 should be set up to answer on the first ring. When the Model 3030 automatically answers, it immediately begins interrogating the caller to see if they are using ASCII mode. If there is a reply in ASCII mode, the Auto-Message is sent in ASCII. If there is no reply in ASCII mode, the Auto-Message is sent in Baudot. The Auto-Message is programmed in Set-Up.

If the Model 3030 does not receive a reply in either mode, it will hang up after waiting a Set-Up programmed interval (Reply Timeout).

If the unit does receive a reply, it notifies the center personnel by turning on its display backlighting and "detection" alarm. Center personnel should immediately connect a keyboard (if not already connected) and handle the TDD call.

Shared Voice/TDD Installations

TDD calls to lines shared with voice may be received in one of three ways:

1. Nothing is heard. Because many TDD callers expect the answering party to type "Hello," the caller may not begin by transmitting. Also if the caller is calling in ASCII originate mode, no tones are generated until the answering unit sends an "answer" tone. If a TDD call is suspected, the call taker should initiate an interrogation by pressing one of the "Message Buttons." The unit will then send an ASCII "answer" tone and wait to see if the caller responds in ASCII. If the unit receives no reply in ASCII mode, it automatically sends the message in Baudot mode. In Baudot mode, the message is sent at the American standard 45.5 baud. In ASCII mode, the message is sent first at 300 baud and then at 110 baud since the caller's rate cannot be determined until he or she begins typing. After the interrogation message is sent, the call taker should allow several seconds for the potential TDD caller to respond. The Model 3030 may be Set-Up to automatically reset after a programmable period (Reply Timeout) if the caller does not respond.

2. TDD Announced. Many modern TDDs are equipped with a synthesized voice announcer to notify the call taker that the caller is using a TDD. If the caller does not begin typing immediately, the call taker should send a "canned" message to the caller providing positive identification to the caller.

3.   TDD tones heard. If a caller using a Baudot TDD begins typing, the call taker will hear TDD tones. The Model 3030 will detect these tones within one or two characters and will turn on the display backlighting as well as the "detection" alarm. If the caller is using an ASCII TDD or computer modem in "ASCII answer" mode, the call taker will also hear a tone. The Model 3030 will detect these ASCII tones if present for more than 3 seconds and will turn on the display backlighting and "detection" alarm.

Connecting with the TDD Caller

When the caller begins typing (or when the caller's ASCII TDD responds to the Model 3030 "answer" tone), the Model 3030 will detect the TDD tones and notify the call taker by turning on the display backlighting and the "detection" alarm. The sound produced by the "detection" alarm depends on the installation. Within the first few characters received from the caller, the Model 3030 is able to determine the caller's baud rate and parity (if ASCII). Messages sent or characters typed after the caller begins typing are sent only at the baud rate and parity used by the caller.

If the Model 3030 has been Set-Up for automatic connection, the unit will also automatically connect to the caller and disconnect the call taker's handset or headset. This prevents the loud tones from being applied to the call taker's ears, and it prevents the call taker's voice from interfering with TDD character decoding. The unit will then automatically send a message to the caller (unless an interrogation has already been made).

If the unit has not been Set-Up for automatic connection, then the unit will not connect to the caller until typing begins on the unit keyboard or a message button is pressed. The Model 3030 will remain connected with the caller until the Reset Button is pressed or three minutes go by without any character being typed by either party. When the unit has been connected for more than two minutes without any activity, the "detection" alarm will again turn on as a warning to the operator.

If the caller is using ASCII mode, the Model 3030 will always automatically connect (regardless of Set-Up) since this is the only way to determine if the caller is truly using ASCII mode.

> **Note**   After the Model 3030 detects a TDD caller, do not hang-up or disconnect your telephone otherwise the calling TDD party may be disconnected.

Once a call has been detected or two minutes of connected inactivity occur, the "detection" alarm will remain on until the A key is typed or until a message button is pressed.

Originating a Call

Originating or placing a call from the communications center to a potential TDD user is done in much the same way as receiving a call. The call is dialed in the same way as any voice call. When the called party answers, the same procedures for receiving a TDD call are used.

If the called party is a TDD user, they will most likely begin typing first (just as a voice user would answer "hello") and these tones will be heard. In this case, if the phone used for placing the call is attached to a Model 3030, the unit TDD detector will detect the tones and send a canned message. If the originating phone is not attached to a Model 3030, when the called party's tones are heard, the operator should immediately transfer the call to a position or extension that is equipped with a Model 3030.

If the called party makes no response (either voice or tones) when the call is answered, then silence will be heard. In this case, if the phone used for placing the call is attached to a Model 3030, the operator should initiate an interrogation by pressing the appropriate message button on the Model 3030. If the originating phone is not attached to a Model 3030, the answered-with-silence call should be transferred to a position or extension that is equipped with a Model 3030 and an interrogation should be initiated from there. Model 3030s connected to a dedicated extension should automatically begin interrogation after the first ring of the transfer.

HCO/VCO Conversations

A Hearing Carry Over (HCO) conversation is one in which the caller is significantly speech impaired but not significantly hearing impaired. In these cases the caller may wish to use their TDD to "talk" to the PSAP and may wish the call taker to use their voice to talk back to them. This requires the ability to quickly switch between TDD and Voice modes. In this case the call will most likely start via TDD using one of the means described in *Receiving a TDD Call* on page *25*.

At some point the caller will type a message indicating that they want the call taker to use their voice to speak back to them. To do this the call taker should press the keyboard **Alt-Delete** keys which will return the unit to Voice mode. When the call taker is done speaking to the caller, they should press the **Alt-Insert** keys to return to the TDD mode in preparation for the caller's text. If the call taker should forget to return the unit to TDD Mode, the unit will automatically enter TDD mode when it detects the tones sent by the caller (assuming detection is enabled).

A Voice Carry Over (VCO) conversation is one in which the caller is significantly hearing impaired but not significantly voice impaired. In these cases the caller may wish to use their voice to talk to the PSAP and may wish the call taker to use TDD to "talk" back to them. This requires the ability to quickly switch between TDD and Voice modes. In this case the call may start either by voice or by TDD using one of the means described in *Receiving a TDD Call* on page *25*.

At some point the caller will indicate that they will be using voice and that they want the call taker to use TDD to "speak" back to them. The call taker should press the keyboard **Alt-Insert** keys to place the unit in TDD mode so that they can type to the caller. When they have finished typing and expect the caller to respond by voice, they should press the **Alt-Delete** keys to place the unit in Voice mode.

Conversing with the TDD Caller - TDD Etiquette

This subsection describes the TDD etiquette commonly used during TDD calls. They do not describe American Sign Language grammar which many who have been deaf from birth use. Please consult a TDD training specialist for more information.

Special TDD abbreviations are commonly used during TDD calls for efficiency. These are "GA", "Q", and "SK".

Abbreviation	Description
GA	Go Ahead. This is typed when the typing party wishes the receiving party to respond. Since most TDDs only allow one party to type at a time, it is most efficient if the receiving party knows when it is their turn to type. Example: "REDMOND 911. GA"
Q	Question Mark. This replaces the "?" question mark. Example: "WHAT IS YOUR NAME Q. GA"
SK	Stop Keying. This is used to end a conversation. The typing party types "SK" when they have nothing more to say. If the receiving party is also done, he should type "SKSK". When both parties have typed "SK" the conversation is completed. Example: "THANK YOU. SK" / "good bye. sksk"

Other abbreviations TDD users often use other abbreviations which are usually easily understood even by non-TDD users. Some examples are "U" for "you", "THX" for "thanks", "ABT" for "about", etc.

Garbled Communications

Due to the inherent limitations of the Baudot mode of communications, you may occasionally experience garbled communications while communicating with a Baudot TDD. You can typically identify this by seeing a series of punctuation marks, numbers, or other such figures when you are expecting alphabetic characters. If this occurs, press the keyboard space bar once and this should clear up the garbling.

Disconnecting After a TDD Call

When the conversation is complete, pressing the Reset Button will disconnect the Model 3030 from the call. The call taker may also have to hang-up their telephone in order to release the line. The unit will also automatically hang up if it hears dial tone for more than 5 seconds.

Printer Messages

If a printer is attached to the Model 3030, it will provide a time stamped log of the conversations. Text typed by the caller is shown in capitals (upper case letters). Text typed by the call taker is shown in lower case letters.

TDD status messages are shown below bracketed in "lesser than" and "greater than" symbols. Status messages have the first letter of each word capitalized in order to distinguish them from typed text. *Table 1* contains a list of messages that may be printed.

Table 1. Model 3030 Printer Messages

Printer Messages	Description
<mm/dd/yy hh:mm:ss>	Date & 24-hour time. Printed at the beginning of interrogation, detection, power-on, or watchdog reset. If an asterisk (*) appears after the time printout, this indicates that the printed time is not synchronized with an external time source.
<hh:mm:ss>	24-hour time printed at the end of each TDD call. This is useful in showing the time elapsed since the beginning of the call. If an asterisk (*) appears after the time printout, this indicates that the printed time is not synchronized with an external time source.
<Zetron Model 3030 Vx.xx> <Power-On>	Printed with time after a power interruption (x.xx is the software version number).
<Watch Dog Reset>	Printed after recovery from a malfunction that may be caused by extreme power fluctuations or static discharge.
<WARNING Set-Up Needed>	Printed after power-on or reset indicating that the unit Set-Up has not been completed.
<Interrogating..>	Printed with date & time indicating that the call taker initiated an interrogation. Usually the interrogation message text follows.
<nn Seconds-No Reply> <Disconnected>	Printed after an interrogation if the Model 3030 did not detect ASCII or Baudot tones. "nn" reflects the time waited for a reply to the interrogation.
<Connected>	Printed with date & time when the unit detects a TDD call and connects to the TDD caller.
<Baudot Heard>	Printed when the unit detects Baudot tones.

Printer Messages	Description
<50 Baud Baudot> <45.5 Baud Baudot>	One of these two messages is printed after a caller using Baudot mode types a few characters. This message indicates the data rate used by the caller.
<ASCII Answer Heard> <ASCII Originate Heard>	Printed when the unit detects ASCII tones. The two messages distinguish between the ASCII mode the caller is using.
<300 Baud ASCII> <110 Baud ASCII>	One of these two messages is printed after a caller using ASCII mode types a few characters (unless 1200 baud). This message indicates the data rate used by the caller.
<1200 Baud ASCII>	Printed if caller's ASCII modem is using 1200 baud.
<Disconnected> <5 secs Dial Tone>	If dial tone is heard for more than 5 seconds, this message will be printed.
<Disconnected> <Reset Button Pressed>	Printed with time when a TDD call is terminated by pressing the unit Reset button. This is also printed when the unit is returned to the Voice mode using the **Alt-Delete** keys.
<Disconnected> <ASCII Carrier Gone>	Printed with time when a TDD call is terminated due to loss of ASCII Carrier.
<2 Minutes no Typing>	Printed if more than 2 minutes transpire without typing by either the caller or call taker.
<Disconnected> <3 Minutes No Typing>	Printed with time if more than 3 minutes transpire without typing by either the caller or call taker. Note that the unit automatically disconnects.
<Switch to TDD Mode>	Printed with time and date when the operator enters the TDD Mode using the **Alt-Insert** keys. This may occur during an HCO/VCO TDD call.

Set-Up

Entering Set-Up

Set-Up allows the user to select various programmable options for the Model 3030 so that its operation may be tailored to the installation and needs of the application. Set-Up is entered by typing an "**S**" on the keyboard while the Model 3030 is idle. The unit will then prompt you to answer a series of questions.

Set Date/Time

The first question is "**Set Date/Time?**". If you wish set the date/time, type "**Y**" for yes otherwise type "**N**" for no.

Setting Date

If the answer to "**Set Date/Time?**" was "**Y**", then the unit will prompt you for the date. Enter the date in the form MM:DD:YY (M=month, D=day, Y=year 19xx). Each date unit requires entering two digits. If you wish to enter a number from 1 to 9, always enter a leading zero.

Setting Time

After setting the date, the unit will prompt you for the time. Enter the time in the form HH:MM:SS (H = hours, M = minutes, S = seconds). Each time unit requires entering two digits. If you wish to enter a number from 0 to 9, always enter a leading zero. The time entry should be made in a 24-hour format.

Set Messages

The next question is "**Set Messages?**". If you wish to set message text, type "**Y**" for yes otherwise type "**N**" for no.

The contents of the 12 messages are factory preset to those messages recommended by the National Emergency Number Association in the specification NENA-04-001 "NENA Generic Standards for E 9-1-1 PSAP Equipment, Issue 1". *Table 2* contains a list of the factory preset messages. Using the "**Set Messages**" selection you may change these messages as required.

Table 2. NENA Recommended Preset Messages

Message #	Factory Preset Message Text
1	_911_WHAT_IS_YOUR_EMERGENCY_Q_GA_
2	_WHAT_IS_YOUR_PHONE_NUMBER_Q_GA_
3	_WHAT_IS_YOUR_NAME_Q_GA_
4	_WHAT_ADDRESS_TO_SEND_HELP_Q_GA_
5	_STAY_CALM_HELP_IS_ON_THE_WAY....
6	_STAY_NEXT_TO_YOUR_TTY_HD....
7	_CALL_BEING_TRANSFERRED_(GIVE-TO)_
8	TO_A_MEDICAL_PLACE_HD...(RINGING)...
9	TO_THE_FIRE_DEPT_HD...(RINGING)...
10	TO_THE_POLICE_HD...(RINGING)...
11	_WHAT_IS_YOUR_HOME_ADDRESS_Q_GA_
12	_WHERE_IS_THE_EMERGENCY_NOW_Q_GA_

Note The underscore ("_") shown in the message text indicates the placement of a space character which begins and ends most messages.

Selecting the Message Number

If the answer to "**Set Messages?**" was "**Y**", then the unit will prompt you to select the message number. Enter the message number using the keyboard function (F) keys usually located at the top of the keyboard. Note that keyboard keys F1, F2, and F3 are the same as the unit front panel message buttons 1, 2, and 3.

Entering the "Canned" Message Text

Once you have selected the message number, you will be asked to enter the message text. Begin typing the desired message text.

> 📝 **Note** When entering the message text, keep in mind that each additional character adds to the transmission time. In an emergency the calling party will have little patience with long messages and the caller cannot type until the message being sent is completed. Therefore, make your messages short using clear abbreviations. It is also a good idea to put a space at the beginning and end of each message to make messages more readable on the caller's display.

When finished, press the "**ESC**" key. If you press "**ESC**" immediately after selecting the message number (without entering any text), the message will be blank and nothing will be sent to the caller.

Set Automatics

The next question is "**Set Automatics?**". If you wish to set automatics, type "**Y**" for yes otherwise type "**N**" for no.

Selecting Auto-Connect

If the answer to "**Set Automatics?**" was "**Y**", then the unit will prompt you to enable or disable the automatic connect feature. The prompt will show the value currently selected. If you do not wish to change the value, press "**Enter**" and the next menu item will appear. You may choose not to have the unit automatically connect with a detected TDD call by entering an "**N**" for no. You may choose to have the unit automatically connect with a detected TDD call by entering "**Y**" for yes. When connected the call taker's handset is normally disconnected. If you choose not to have the unit automatically connect, the unit will connect only if the call taker types on the keyboard or sends a message.

Selecting Answer Rings

The unit will next prompt you to select the number of answer rings. The prompt will show the value currently selected. If you do not wish to change the value, press "**Enter**" and the next menu item will appear. You may choose not to have the unit automatically answer a ringing line by entering a "**0**" (for none). You may choose to have the unit answer after a certain number of rings by entering a number from "**1**" to "**9**". This number is the number of rings required before the unit automatically answers. If the unit is installed on a dedicated extension, this value should be set to "**1**" so that interrogation

will begin as soon as possible. Only enter a non-zero value if the unit is to be connected to a dedicated TDD phone line or extension.

If this value is non-zero, the unit will not properly detect TDD tones in non-dedicated applications. If you enter a value for Answer Rings, the true TDD and interrogation counters will be cleared.

Selecting Auto-Message

The unit will next prompt you to select the automatic connect/automatic answer message number. The prompt will show the value currently selected. If you do not wish to change the value, press "**Enter**" and the next menu item will appear. Enter the number of the message by using the keyboard's function (F) keys. This will become the message that will be sent whenever the unit automatically answers a ringing line, or whenever the unit automatically connects with a detected TDD caller. If you do not wish an automatic message to be sent, set the Auto-Message to a message that is blank.

Selecting Reply-Timeout

The unit will next prompt you to enter the reply timeout. The prompt will show the value currently selected. If you do not wish to change the value, press "**Enter**" and the next menu item will appear. Reply timeout is the time which the unit waits for a TDD caller to reply to an interrogation before automatically resetting. Enter a two digit number from "**00**" to "**99**" seconds. Two digits must be entered. For values from 1 to 9 seconds, a leading zero must be entered first. If you wish the unit not to automatically reset while waiting for a reply, enter the value "**00**". The unit will always automatically reset after the standard 3-minute inactivity time.

Selecting CAD Enable

The unit will next prompt you to select CAD enable. The prompt will show the value currently selected. If you do not wish to change the value, press "**Enter**" and the next menu item will appear. You may choose to dedicate the unit serial port to a CAD system by entering a "**Y**" for yes. Alternatively, you may choose to dedicate the unit serial port to a serial printer by entering an "**N**" for no.

Selecting RS-232 Serial Port Baud Rate

The unit will next prompt you to select the RS-232 serial port baud rate. The prompt will show the value currently selected. If you do not wish to change the value, press "**Enter**" and the next menu item will appear. You may choose to change the baud rate by pressing the keyboard Tab key. The available choices are 300, 600, 1200, 2400 and 4800 baud. This baud rate should be selected to match the baud rate of the device connected to the port (serial printer, synchronized clock, or CAD system). It is preferable to use the highest baud rate possible.

Selecting ASCII Enable

The unit will next prompt you to select ASCII enable. The prompt will show the value currently selected. If you do not wish to change the value, press "**Enter**" and the next menu item will appear. You may choose to enable the ASCII format by entering "**Y**" for yes. Alternatively, you may choose to disable the ASCII format by entering "**N**" for no.

Selecting ASCII Detection Enable

The unit will next prompt you to select ASCII Detection Enable. The prompt will show the value currently selected. This selection has no effect if the selection of "**ASCII Enable**" is "**N**". If the selection of "**ASCII Enable**" is "**Y**", then entering "**Y**" for this item will enable the detection of ASCII tones while in the idle state. Entering "**N**" disables the detection of ASCII in the idle state, but ASCII may still be detected during interrogations if the selection of "**ASCII Enable**" is "**Y**". Answering "**N**" to this item eliminates false detections when originating a call to special pay phones.

Print Set-Up

The unit will next prompt you to print the set-up. If you wish to have all set-up programming printed for review or documentation, or if you wish to send it to the CAD system, type "**Y**" for yes. Typing anything else will not print the set-up.

Test TDD

Test facilities are enabled by typing "**Y**" in response to this prompt.

Installation

Mounting

The Model 3030 mounts in either the Motorola Centracom II Channel Control Panel (abbreviated "CCP", part number B1401), or the Zetron Series 3000 Rack Chassis (part number 901-9256).

Motorola Installation

To install the unit in the Centracom II CCP, pull out the CCP from the console furniture. This is done by removing the plastic covers at the end of the CCP and removing the center two screws on either end. The plastic covers may be removed by lifting at the center so that the cover bows, then the catches at the top and bottom of the cover will be released. Newer panels will require a T-20 Torx driver to remove the end screws.

Once the CCP is pulled out loosen the four screws securing the module label bars. The bars are located along the top and bottom edge of the CCP. The screws are located at the top and bottom of both sides. Newer panels will require a T-10 Torx driver to loosen these screws.

Now remove the two blank module covers that will be replaced by the Model 3030. Note that due to interferences, certain locations within the CCP may not be occupied by the Model 3030. *Figure 1* shows the locations to avoid. The Model 3030 will not fit location 2/3 or 3/4. The unit also may not fit location 4/5 on certain panels. This information is accurate for CCP part number B1401 revision B. There may also be additional restrictions when using CCP B1401 revision A.

Figure 1. Mounting Positions in the Motorola "CCP"
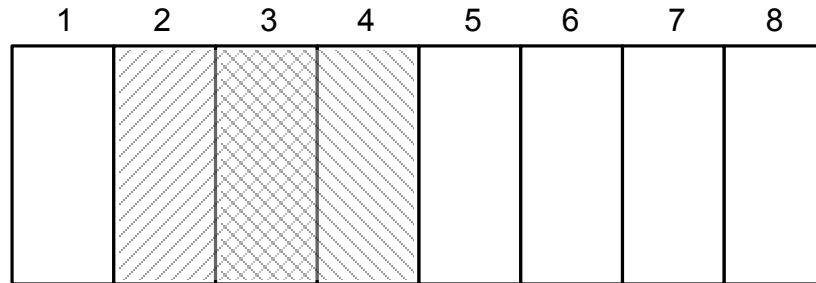
Prior to installing the Model 3030, loosen the screws securing the TDD rear panel to its chassis. Also loosen the screws which tighten the rear panel clamp. Insert the Model 3030 into the desired location and slide the rear panel clamp over the CCP rear lip. Be sure that the front panel of the unit is square with the other modules and then tighten the clamp and rear panel screws.

The CCP module label bars may then be flipped down and secured. The CCP may then be re-installed into the console furniture.

> **Note** The Model 3030 chassis may interfere with the CCP slide rack tilt feature. Caution should be taken not to allow the rear of the Model 3030 to rest against the electronics board of any rack unit mounted above the CCP.

Zetron Installation

To install the Model 3030 in the Zetron Series 3000 Rack Chassis, remove the chassis from the console furniture. This is done by removing the four screws on the rack ends. Then, using a 1/16th-inch Allen wrench, remove the module securing bars which are screwed to the top and bottom front of the chassis. Remove the two blank modules which occupy the space you desire for the Model 3030.

Prior to installing the Model 3030, remove the screws securing the TDD rear panel to its chassis. Also loosen the screws which tighten the rear panel clamp. Insert the Model 3030 into the desired location and slide the rear panel clamp over the Series 3000 Chassis rear lip. Be sure that the front panel of the unit is square with the other modules and then tighten the clamp and rear panel screws.

Now re-install the module securing bars and replace the unit into the rack furniture.

Power

The Model 3030 is powered either from 12 Vac or 15 Vdc. The unit is shipped from the factory with a line-powered wall adapter with an output of 12 Vac suit able for powering the Model 3030. The 12 Vac wall adapter plugs into the barrel receptacle at the rear of the Model 3030.

The unit may also be powered from the 15 Vdc power bus of the Motorola Centracom II. The 3-pin plug on the rear panel of the unit is compatible with Motorola's power connectors. Powering from the console may be desirable especially if the console has back-up power provisions which will keep the Model 3030 operating even during line outages. The Model 3030 requires less than 0.5 ampere of power from either power source.

If the unit is operating with the optional Model 3031 Printer Module, the Model 3030 PSAP TDD may obtain its power from the printer. This is done by connecting the Series 3000 Power Sharing Cable (Part No. 709-7312 included with the Model 3031) between the 3-pin DC power plugs on the rear of the printer and TDD units. If you choose this method of providing power, do not use the AC wall adapter unit supplied with the Model 3030. The Model 3031 Printer Module must use its larger AC wall adapter unit.

DANGER! NEVER CONNECT BOTH 12 Vac AND 15 Vdc POWER SOURCES TO THE MODEL 3030. THIS WILL RESULT IN DAMAGE TO THE MODEL 3030 AND THE POWER SUPPLIES!

Telephone

The Model 3030 may be interfaced to the 911 center phone system in a variety of ways depending on the application.

Direct Connection to a Dedicated TDD Line/Extension

Note that under the U.S. Federal Americans with Disabilities Act, you may not require TDD callers to dial any number other than the normal voice emergency number used by the general public.

Attaching the Model 3030 to a dedicated extension allows call takers to transfer a silent or tone call to the common Model 3030 for interrogation, and then be able to handle other calls.

Be sure that the extension that you attach the Model 3030 to is a regular line that supplies ringing and is compatible with normal residential-type telephones. Extensions requiring

specialized phone sets (such as digital phones) will not work with the Model 3030. Most phone systems allow options for ringing normal telephone sets.

This is the simplest of all installations. The dedicated telephone line plugs into the rear panel jack labeled "LINE". A regular telephone may also be installed in the event that a voice call is mistakenly placed to the dedicated line. The telephone is connected to the rear panel jack labeled "PHONE". The "LINE" jack is normally connected to the "PHONE" jack until the unit connects with a caller (either because it automatically answered a ringing line, or because it detected TDD tones and automatically connected with the TDD caller). While the unit is interrogating or is connected with a TDD caller, the "PHONE" jack is disconnected. After pressing the unit Reset Button, the "PHONE" jack is re-connected to the "LINE" jack.

1A2 Key-System Installations

The Model 3030 may be interfaced to a traditional analog 1A2 multi-line telephone. Internal to the telephone is a network hybrid which is connected to the selected line tip and ring signals. The Model 3030 should be connected to the selected line tip and ring as shown in *Figure 2*.

Figure 2. Preferred "1A2" Multi-line Telephone Installation
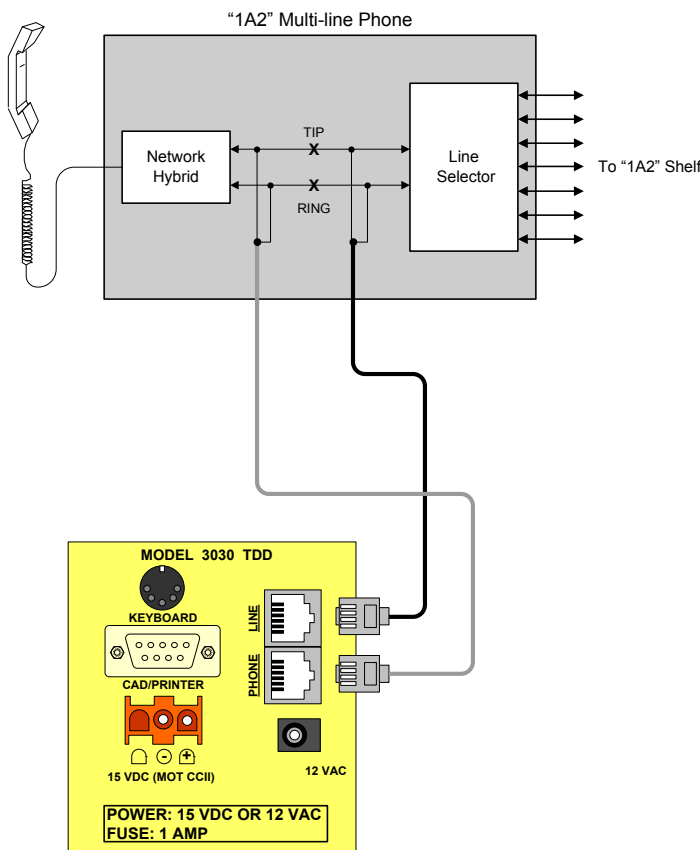
For this type of installation the selected line tip and ring signals (red and green wires to network) are cut and routed through the Model 3030. The side nearest the line selector plugs into the Model 3030 "LINE" jack. The side nearest the network plugs into the Model 3030 "PHONE" jack. This provides the feature of muting the telephone handset while the Model 3030 is interrogating or connected with a TDD caller.

This type of installation has a disadvantage. If the Model 3030 is removed for any reason, the telephone network is disconnected unless the "LINE" and "PHONE" cables are spliced together. Such splices are readily available from many local home electronics suppliers. If the potential disadvantage of this type of installation is too great then an alternative installation places the Model 3030 in parallel with the telephone network as shown in *Figure 3*. This alternative installation will not provide muting of TDD activity which may produce annoying tones during a TDD call and may decrease the TDD decoding effectiveness of the Model 3030.

Figure 3. Alternative "1A2" Multi-line Telephone Installation
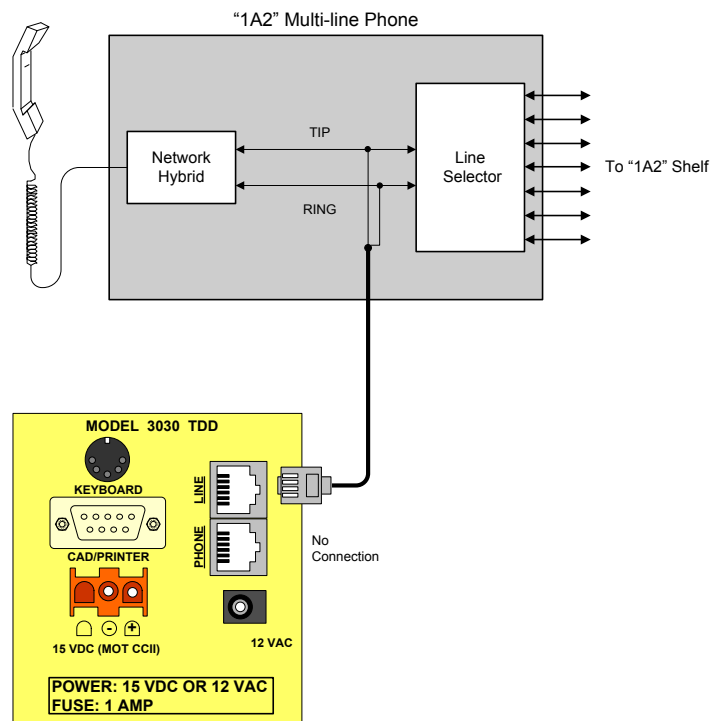
| | Note | Installations using the alternative "1A2" installation have experienced some difficulty in decoding the caller's text due to the reduced signal amplitude caused by parallel operation. |

Digital Telephone Installations

Most usually digital telephone systems cannot be directly connected to the "LINE" jack of the Model 3030. For digital telephones the only sure location to obtain analog signals needed for the Model 3030 is the telephone handset. This requires the use of the Model 3030 TDD Handset Interface. The diagram in *Figure 4* shows a typical installation.

🛑 **STOP** **Warning!** Never connect both a TDD Handset Interface and a Telephone Line/Telephone to the Model 3030. If **J1** is used, never plug any cables into the **LINE** or **PHONE** jacks. Doing so may result in damage to the Model 3030 and/or the telephone.

Figure 4. Digital Telephone Installation
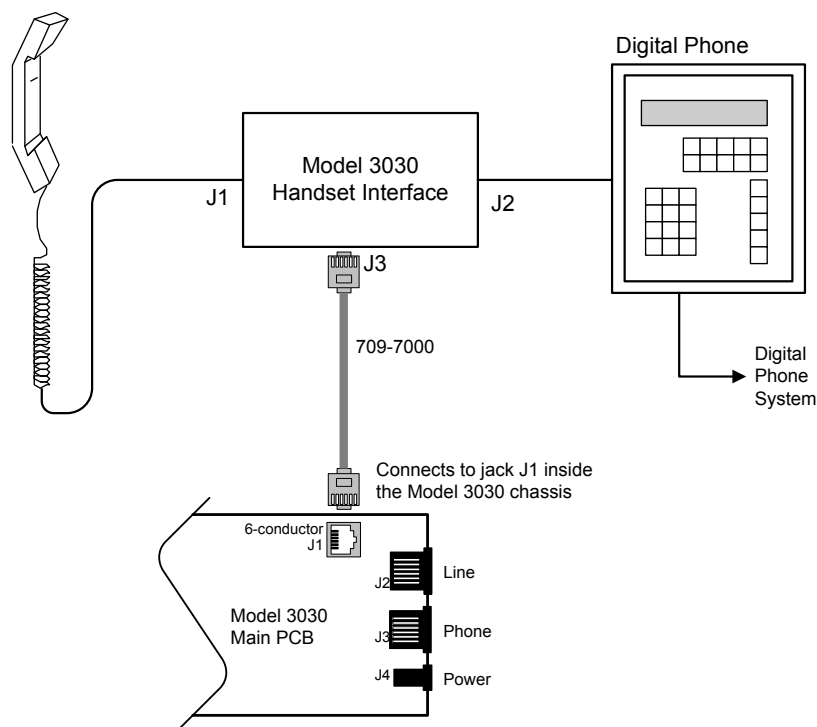
♦ **Wiring**

1. Remove the handset cord from the telephone handset jack at the telephone end of the cord. Install the handset cord into the Handset Interface jack labeled "To Handset/Headset" (J1).

2. With the supplied short 4-conductor modular cable, install one end in the telephone handset jack and the other end in the Handset Interface jack labeled "To Telephone" (J2).

3. With the supplied 10 foot 6-conductor modular cable, install one end in the Handset Interface jack labeled "To Model 3030" (J3) and the other end into the

Model 3030 jack, J1. J1 on the Model 3030 is not visible from the rear panel but is accessible from the component side of the main circuit board near the rear panel.

♦ **Configuring the Model 3030**

1. Move the jumper labeled "JP3" on the Model 3030 Controller Board (702-9399) to the "B" or upper position. (On older revision boards, this jumper is labeled "JP4"). The jumper is located on the main circuit board approximately near the middle towards the bottom in between the two cables plugged into the middle of the circuit board.

2. Via the Model 3030 Set Up, program the "Answer Rings" to "0". If this is not done, the Model 3030 will not automatically detect TDD tones heard on the handset.

Configuring the Handset Interface will require access to the circuit board. The case is disassembled by removing the four screws accessible from the bottom of the interface case.

♦ **Configuring the Handset Interface**

1. If you desire the interface to automatically mute the handset while interrogating or communicating with a TDD caller, place jumpers labeled "JP1" and "JP2" on the Handset Interface Board (702-9430) in the "A" position. If you desire the handset to be live during a TDD call, place the jumpers in the "B" position.

2. The levels for the handset are adjustable using the DIP-switch, SW1 on the Handset Interface Board (702-9430). Switches 5, 6, 7, and 8 adjust transmit (microphone) level. Switches 1, 2, 3, and 4 adjust receive (earpiece) level. The following are two common settings:

Phone Type	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Standard 2500 Set	on	on	off	on	on	off	on	on*
Most Modern Sets	on	on	off	on	on	off	on	off

* Use for Western Electric (ATT) Call Directors & Plant Equipment phones.

MAX Call-Taking Console Installations

For installations in parallel with a MAX Call-Taking console position, the only sure location to obtain analog signals needed for the Model 3030 is the Headset 1 output on the Media Dock XS that is part of the console equipment. This requires the use of the Model 3030 TDD Handset Interface. The diagram in *Figure 5* shows a typical installation.

The cable used to connect the TDD Handset Interface box to the Media Dock XS, part number 709-8074, is available from Zetron; however it is not listed on the regular pricelist. If you are interested in creating this interface, contact Customer Support at Zetron for a quote of price and availability.

Figure 5: MAX Call-Taking Installation
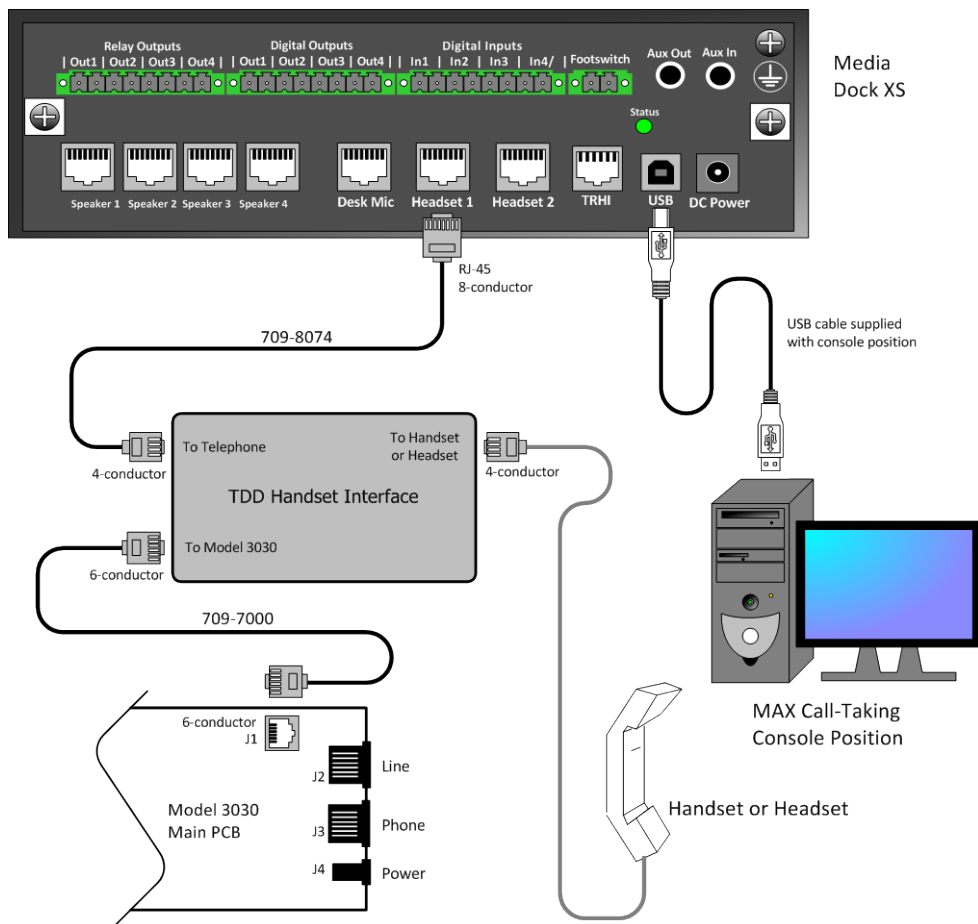
> | STOP | **Warning!** | Never connect both a TDD Handset Interface and a Telephone Line/Telephone to the Model 3030. If **J1** is used, never plug any cables into the **LINE** or **PHONE** jacks. Doing so may result in damage to the Model 3030 and/or the telephone.

♦ **Wiring**

1. Using the interface cable (part number 709-8074) obtained from Zetron; insert the RJ-45 end (8-conductor) into the **Headset 1** jack on the rear of the MAX Call-Taking console position Media Dock XS. Connect the other end (with the 4-conductor modular connector) into the jack on the TDD Handset Interface box labeled **To Telephone** (J2).

2. Using the supplied 10 foot, 6-conductor modular cable (part number 709-7000), install one end in the TDD Handset Interface jack labeled **To Model 3030** (J3) and the other end into the Model 3030 jack, **J1**. The jack **J1** on the Model 3030 is not visible from the rear panel but is accessible from the component side of the main circuit board near the rear panel.

3. [Optional Step] A headset or handset terminated in a 4-conductor telephone handset modular connector may be plugged into the TDD Handset Interface jack labeled **To Handset or Headset** (J1).

♦ **Configuring the Model 3030**

1. Move the jumper labeled **JP3** on the Model 3030 Controller Board (702-9399) to the **B** or upper position. (On older revision boards, this jumper is labeled **JP4**). The jumper is located on the main circuit board approximately near the middle towards the bottom in between the two cables plugged into the middle of the circuit board.

2. By means of the Model 3030 Set Up, set the **Answer Rings** parameter to **0**. If this is not done, the Model 3030 will not automatically detect TDD tones heard on the handset.

Configuring the Handset Interface will require access to the circuit board. The case is disassembled by removing the four screws accessible from the bottom of the interface case.

♦ **Configuring the TDD Handset Interface**

1. If you desire the interface to automatically mute the handset while interrogating or communicating with a TDD caller, place jumpers labeled **JP1** and **JP2** on the TDD Handset Interface Board (702-9430) in the **A** position. If you desire the handset to be live during a TDD call, place the jumpers in the **B** position.

2. The levels for the handset are adjustable using the DIP-switch, **SW1** on the TDD Handset Interface Board (702-9430). Switches **5**, **6**, **7**, and **8** adjust transmit (microphone) level. Switches **1**, **2**, **3**, and **4** adjust receive (earpiece) level. The following are two common settings:

Phone Type	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Standard 2500 Set	on	on	off	on	on	off	on	on*
Most Modern Sets	on	on	off	on	on	off	on	off

* Use for Western Electric (ATT) Call Directors & Plant Equipment phones.

Printer/CAD

The RS-232 serial port of the Model 3030 may be used to provide logging data to a serial printer or it may be used to provide an interface to a Computer Aided Dispatch (CAD) system.

The Printer/CAD port connector is located on the rear panel of the Model 3030. The connector is a 9-pin "D" type female socket. The following describes the pin assignments of the connector. See the Appendix for CAD operation.

Table 3. Printer / CAD Serial Port Signals

Pin	Signal
3	Transmit Data (to Printer/CAD)
4	Receive Data (from Printer/CAD)
5	Signal Ground

Synchronized Clock

If the RS-232 port of the Model 3030 is not being used for connection to a CAD system, it may be used to connect to both a serial printer (such as the Model 3031) and a synchronized clock (such as the Spectracom Netclock II). This connection is made easy by using the Model 3030 External Time Sync cable available from Zetron. If you wish to make your own cable, then the Transmit Data and Signal Ground signals must be wired to the serial printer and the Receive Data and Signal Ground signals must be wired to the Synchronized Clock.

The data must be RS-232 ASCII Time code sent once-per-second. The baud rate of the source clock and the Model 3030 must match. The format of the time code must be Spectracom Format 0, Spectracom Format 1, or NENA-04-002 RS-232 ASCII Time code. For systems using multiple Model 3030s, Spectracom's TimeTap product or equivalent should be used. The 25-pin connector on the Model 3030 External Time Sync cable is plug compatible with TimeTap.

Detection Alarm

The Model 3030 is equipped with a Detection Alarm feature which closes a relay contact upon detection of TDD signaling. This contact opens once the call taker begins communicating with the caller either by "canned" messages or by typing on the keyboard. The contact is capable of handling 0.5 amperes at 30 volts DC. The contact closure is available across the two wires of the pigtail connector plugged into pins J10 (labeled "ALARM") on the back of the front panel board.

Keyboard

The Model 3030 uses a standard "Enhanced 101" AT-style keyboard for Set-Up programming and for conversing with the TDD caller. Five-pin DIN connectors for the keyboards are located on both the front panel and the rear panel. The front panel connector is designed for temporary connection of the keyboard (to be plugged in during Set-Up or during connection with the TDD caller). The rear panel connector is provided for installations where the keyboard will always be connected.

When a keyboard is first attached, the first key typed is often not recognized by the Model 3030. This is normal.

> **Note**   Never connect more than one keyboard to the Model 3030. This may result in improper operation of the keyboard.

Labeling

The three message buttons on the front panel of the Model 3030 may be labeled to represent the message which is generated when pushed. The top of the button is a clear lens which may be removed so that a label may be inserted.

Adjustments

LCD Viewing Angle

The LCD display has an adjustable viewing angle. The super-twist technology used for the display allows it to be viewed from nearly any angle if it is properly adjusted. The unit is delivered from the factory properly adjusted. However, changes in altitude, temperature, or replacement of the display may require re-adjusting the viewing angle. The adjustment is accessed via the hole in the chassis nearest the front panel (behind the main circuit board).

Speaker Volume

The built-in monitor speaker has a volume adjustment allowing the volume level to be tailored to the installation. The adjustment is accessed via the hole in the chassis near the center of the unit (behind the main circuit board).

There are two other adjustments located on the component side of the main circuit board. These are factory adjusted and sealed. Never change these adjustments otherwise TDD decoding will be impaired.

Troubleshooting

Potential Problems and Possible Solutions

This section provides some suggestions useful in troubleshooting situations that may occur with the installation or operation of the Model 3030. For further help, please contact the Zetron Public Safety Service Department at (206) 820-6363.

Problem
The Model 3030 display is blank. Pressing any of the front panel buttons does not affect the Model 3030 display.

Solution
Verify that a 12-Vac, 1-A supply (for a Model 3030F: a 12-Vac, 2-A supply is needed) or the Motorola Centracom II 15-Vdc supply is connected to the rear of the Model 3030. Verify that the 1-A, fast fuse is in good condition. Check potentiometer 3, located on the left side of the chassis nearest to the front panel, and adjust for contrast if needed. Maximum contrast can be achieved by turning R3 counterclockwise.

Problem
The Model 3030 display shows "WARNING SET-UP NEEDED".

Solution
Attach an "AT" compatible keyboard to either the front or rear keyboard ports on the Model 3030 and enter an "S". The statement "Set Date & Time" should appear. Refer to *Set Date/Time* on page *31* for detailed information on programming the Model 3030. Make sure to use only an "AT" compatible keyboard. With an auto-sense keyboard, change the dip-switches, according to the manufacturer, to "AT" mode.

Problem

The Model 3030 display continuously flashes and shows:

```
------Idle-------
```
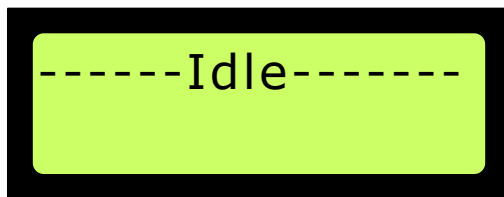
Solution

Check keyboard for stuck keys. This condition can be caused by holding down certain buttons on the keyboard for a period of time. Also check the CAD port as well. Any information passed by either the CAD or keyboard port that the Model 3030 interprets as invalid characters will cause this situation. This may also be caused by using an incompatible keyboard.

Problem

Software version of the Model 3030 is not known.

Solution

Verify the software is working correctly by pressing and holding the "RESET" button. The display on the Model 3030 should show:

```
Model 3030  TDD
Vx.xx yyyy/zzzz
```
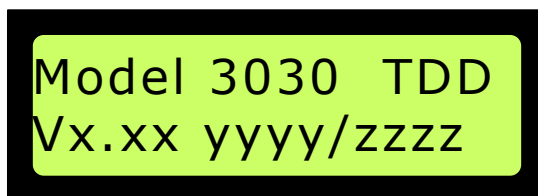
The "Vx.xx" denotes the software version in use with the Model 3030. The software version is also located on the label of U1.

Problem

The Model 3030 outputs characters "C=02 D=FFFF X=FFFF Y=FFFF P=E078" to the CAD or printer port for several lines.

Solution

This might occur when the TDD caller types rapidly prior to or during interrogation, before a canned message is displayed. The Model 3030 at that point is trying to determine the protocol and baud rate of the caller and multiple keystrokes at that time could result in a longer interval before the Model 3030 decodes properly. Another cause of this output may result from receiving ASCII calls from certain pay phones equipped with nonstandard modems.

Problem
The volume on the Model 3030 needs adjustment.

Solution
Locate potentiometer R58 on the left side of the chassis near the rear of the unit, and turn it counterclockwise to lower the sound level.

Problem
Model 3030 is not activating on a known TDD call.

Solution
Check the VU meter on the front panel of the Model 3030 for a good level, about 7/10^{ths} the full range of the VU meter, when the line is off-hook. Make sure the incoming telephone line is connected to the "LINE" input on the rear of the Model 3030. If the call is a known ASCII, make sure the ASCII feature is enabled through the menu of the Model 3030.

If there is no sound when the Model 3030 is interrogating, check jumper JP3. The jumper should be in the "A" or lower position if a Model 3030 Handset Interface is not being used. If the Handset Interface is being used, refer to "Handset Interface Tips" at the end of this section.

Problem
Model 3030 has many errors decoding an ASCII call.

Solution
If using the Handset Interface, make sure handset/headset is muted when there is a TDD call. Refer to "Handset Interface Tips" at the end of this section. In all cases, check phone line for noise and signal level.

Problem
Model 3030 has many errors decoding a Baudot call.

Solution
If possible, make sure the Model 3030 is installed in series rather than in parallel to ensure proper signal levels. If the errors are consistent (for instance, the caller is typing letters and the Model 3030 display is showing invalid numbers and figures), press the space bar on the keyboard. This may occur when the TDD caller types on their keyboard prior to the Model 3030 detecting the baud rate and protocol of the call. Check the phone line for noise and signal level.

For users of the Model 3030 Handset Interface (Part No. 950-9299), here are some additional tips to follow when installing it with the Model 3030. Refer to the Zetron Model 3030 Handset Interface Installation Instructions (Part No. 011-0108) included with the Handset Interface for detailed information.

- It is recommended that JP1 and JP2 on the Model 3030 Handset Interface be placed in the "A" position to mute the handset when the Model 3030 detects that the call is an actual TDD call. In this way, the dispatcher's voice does not interfere with the decoding process.

- If adjusting the audio level from the Model 3030 Handset Interface, refer to the level switches described in the Zetron Model 3030 Handset Interface Installation Instructions (Part No. 011-0108) included with the Handset Interface. Adjust the receive and transmit levels until a "normal" audio signal shows about 7/10ths full scale on the Model 3030 VU meter located under the "Idle" line. This is especially important when installing a Model 3030 in a parallel line installation.

- Make sure JP3 on the Model 3030 (located on the lower center of the main board) is in the upper "B" position when using with the Handset Interface. This routes the audio from the Model 3030 to J1 instead of to the rear LINE modular connector.

- In the menu setup of the Model 3030, make sure Answer Rings is "0" so that the Model 3030 will automatically activate when there are TDD tones present.

Drawings

The drawings on the following pages have been included to assist you in trouble shooting problems with a Model 3030 installation.

Model 3030 Assembly Drawing
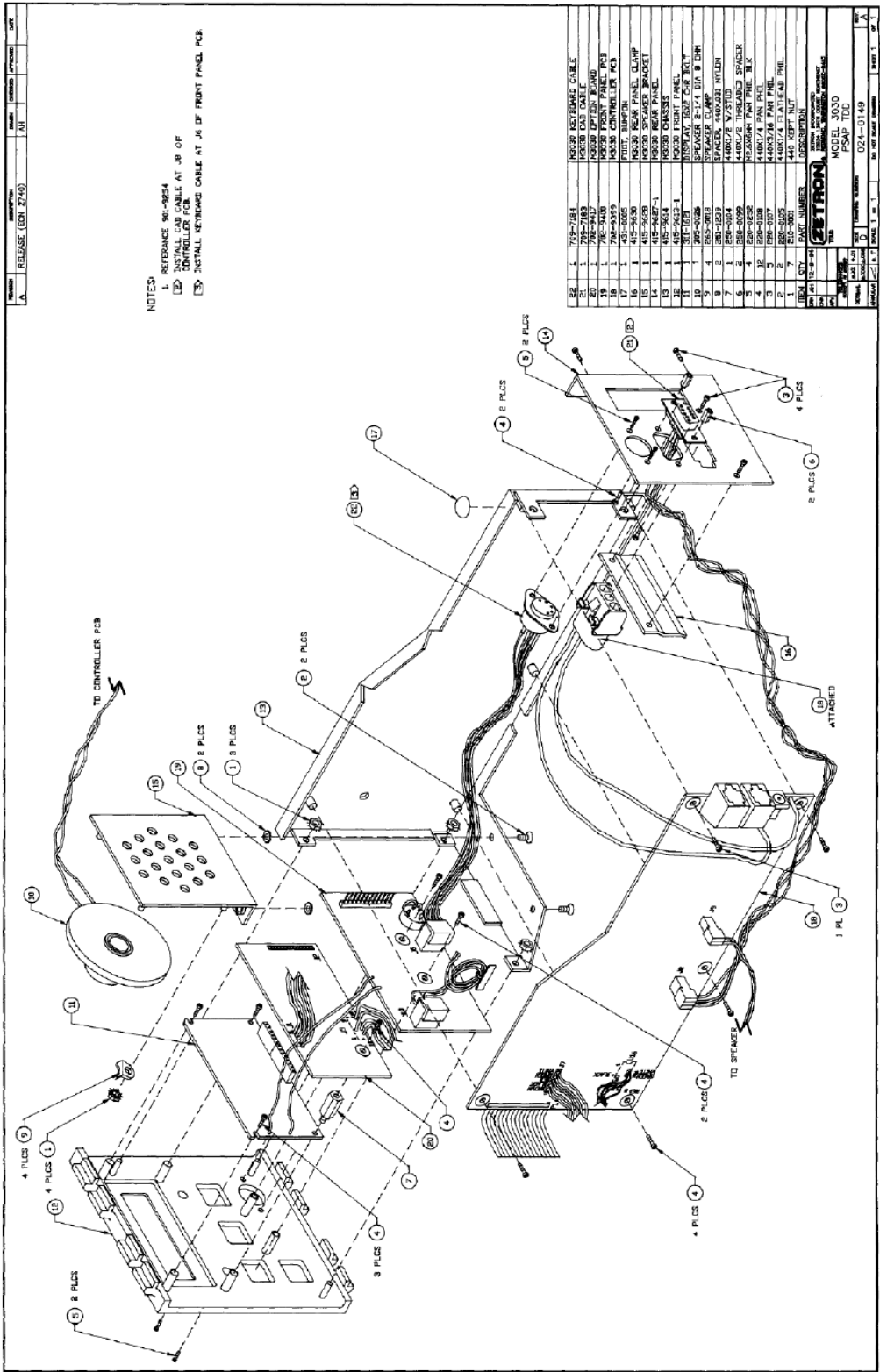
Model 3030 CAD Cable Drawing
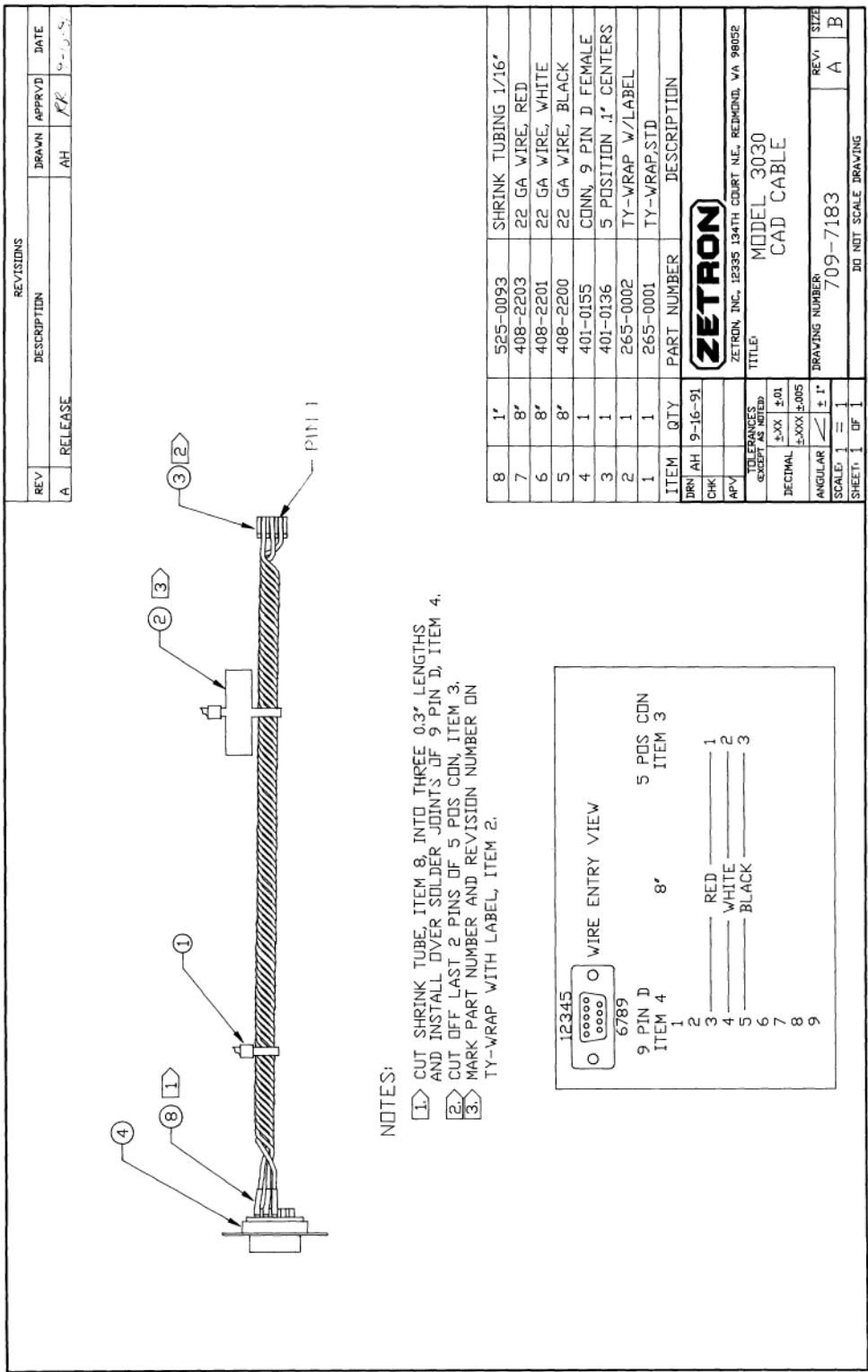
Model 3030 Keyboard Cable Drawing

ITEM	QTY.	PART NUMBER	DESCRIPTION
10	1.5"	525-0093	SHRINK TUBING 1/16"
9	10"	408-2203	22 GA WIRE, RED
8	10"	408-2202	22 GA WIRE, GREEN
7	20"	408-2201	22 GA WIRE, WHITE
6	10"	408-2200	22 GA WIRE, BLACK
5	1	401-1002	5-PIN DIN PCB PERP MNT
4	1	401-0160	COVER FOR 401-0136
3	1	401-0136	5-POS CON .1" CNETERS
2	1	265-0002	TY-WRAP W/LABEL
1	2	265-0001	TY-WRAP, STD

NOTES:

1. CUT SHRINK TUBE, ITEM 10, INTO FIVE 0.3" LENGTHS AND INSTALL OVER SOLDER JOINTS OF 5-PIN DIN, ITEM 5.
2. MARK PER MANUFACTURING PROCEDURE 019-0001.

WIRE ENTRY VIEW

5-PIN DIN ITEM 5 — 10"
1 — WHITE
2 — WHITE
3 — GREEN
4 — BLACK
5 — RED

5 POS CON ITEM 5
5
4
3
2
1

10.5"±1"

PIN 1

ZETRON INCORPORATED
PO BOX 97004
REDMOND, WASHINGTON 98073-9704

TITLE: MODEL 3030 KEYBOARD CABLE

SIZE B DRAWING NUMBER: 709-7184 REV. A.1

SCALE: NONE DO NOT SCALE DRAWING SHEET 1 OF 1

REVISION	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
A	RELEASE	AH	RR	mc	9-16-91
A.1	REDLINE	VP			12-3-98

Appendix A: Baudot Code

Baudot Code

Code		Standard	
Decimal	**Hexadecimal**	**Letter**	**Figure**
0	00	--back space--	
1	01	E	3
2	02	--line feed---	
3	03	A	-
4	04	----space-----	
5	05	S	-bell-
6	06	I	8
7	07	U	7
8	08	--carriage return--	
9	09	D	$
10	0A	R	4
11	0B	J	'
12	0C	N	,
13	0D	F	!
14	0E	C	:
15	0F	K	(
16	10	T	5
17	11	Z	"
18	12	L	)
19	13	W	2
20	14	H	=

Code		Standard	
Decimal	**Hexadecimal**	**Letter**	**Figure**
21	15	Y	6
22	16	P	0
23	17	Q	1
24	18	O	9
25	19	B	?
26	1A	G	+
27	1B	-figure shift-	
28	1C	M	.
29	1D	X	/
30	1E	V	;
31	1F	-letter shift-	

Computer Aided Dispatch (CAD) Operation

This appendix specifies the interface requirements for connection and communication between a computer and the Zetron Model 3030 PSAP (Public Safety Answering Point) TDD (Telecommunications Device for the Deaf).

The Model 3030 CAD Adapter Cable (part number 950-0068/709-7490) converts the Zetron proprietary 9-pin serial port on the rear of the Model 3030 PSAP TDD into a standard 9-pin "RS-232" serial port for ready connection to a Computer Aided Dispatch workstation. The resulting connection appears as an EIA/TIA-574 (standard 9-pin serial port) DCE (modem).

Connection

Parameter	Description
Physical	DE9S (female) Pin 4 - Data from computer Pin 3 - Data to computer Pin 5 - Signal Ground
Electrical	RS-232 compatible

Parameter	Description
Protocol	ANSI Standard (start, LSB 1st, MSB last, stop) 8-bits data (MSB=0/space), no parity, 1 stop bit Full-duplex (unit echoes all characters back to CAD)
Data Rate	4800 baud
Handshake	Xon/Xoff

Figure 6. Model 3030 CAD Adapter Cable 950-0068

9-pin Male
Connects to
Rear of M3030

9-pin Female
Connects to
CAD Workstation

1	1
2	2 RXD (to CAD)
3	3 TXD (to M3030)
4	4 DTR
5	5 GND (Ground)
6	6 DSR
7	7 RTS
8	8 CTS
9	9
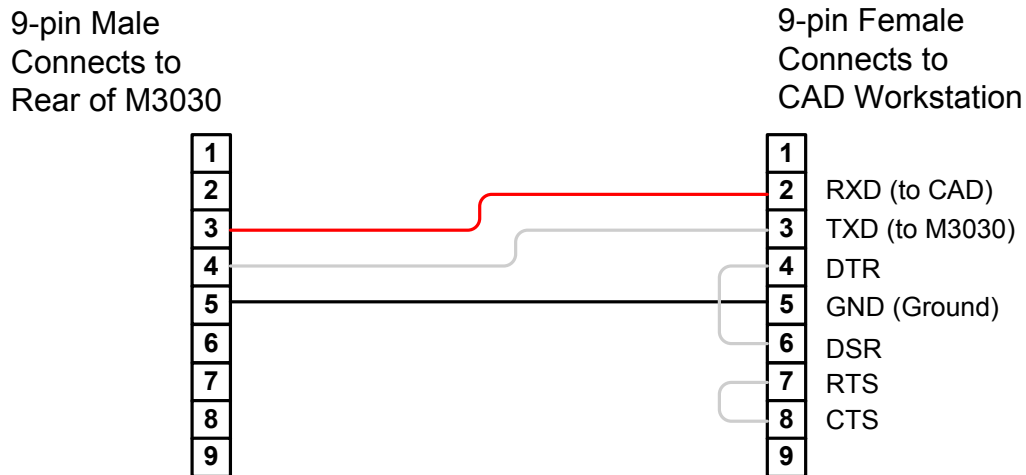
Installation

The male end (has pins) of the adapter cable plugs into the 9-pin connector on the rear of the Model 3030 PSAP TDD. Use the hood screws to secure the cable to the unit.

The cable from the CAD workstation plugs into the female end (sockets) of the CAD Adapter Cable. Threaded spacers on this connector permit the CAD cable to be secured using the CAD cable hood screws. If the CAD workstation serial port uses a standard 9-pin male (DTE) connector you may use Zetron 9-pin cable part number 709-7345 to connect the workstation to the CAD Adapter Cable. Alternatively, a 9-pin monitor extension cable (EGA type) may be used.

Communication

Status Packets sent from Model 3030 to CAD

Label	Packet	Description
Line Ringing	<SOH>R	This is issued whenever the unit detects ringing on a dedicated line. When the unit is connected to the handset of a phone, it will never detect ringing.
Line Answered/Interrogating	<SOH>+	This is issued whenever the unit answers the line and beings interrogating for a TDD call. This status can be sent in response to an "Answer Line/Interrogate" command. It may also be issued upon ringing detection if it is programmed to automatically answer. It may also be issued upon detecting Baudot tones if it is programmed to connect upon tone detection.
Interrogation Timeout	<SOH>T	This is issued after receiving the "Answer Line/Interrogate" command if the interrogation fails to find a TDD call. "Line Disconnected/Reset" status will follow this.
Line Disconnected/Reset	<SOH>-	This is issued after receiving the "Disconnect Line/Reset" command. It is also sent if the Reply Timeout expires (no text received from CAD or TDD caller).
Connected in Baudot Mode	<SOH>B	This is issued after the "Line Answered/Interrogating" status if the unit finds that the caller is using a Baudot TDD.
Connected in ASCII Mode	<SOH>A	This is issued after the "Line Answered/Interrogating" status if the unit finds that the caller is using an ASCII TDD

Command Packets sent from CAD to Model 3030

Label	Packet	Description
Disconnect Line/Reset	<SOH>-	This forces the Model 3030 reset and disconnect from the line. In response to this the unit will send the "Line Disconnected/Reset" status.
Interrogate/Send Message n	<SOH>n (n = 0-9)	This causes the Model 3030 to send "canned message" number "n" (n = 0-9) to the TDD caller. The text of this canned message is sent to the CAD regardless of the duplex mode set up on the unit CAD port. Message n = 0 is actually message 10. Messages 11 and 12 are not CAD accessible.
Switch to TDD Mode	<SOH>T	Sending this command while the unit is in the idle state causes the unit to directly enter the Baudot TDD Mode without interrogation or sending any message. This is useful for HCO/VCO conversations. In response to this, the unit will send the "Line Answered" and "Connected in Baudot Mode" status.
Switch to Voice Mode	<SOH>V	Sending this command while the unit is in the TDD mode causes the unit to return to the Voice Mode. This is useful for HCO/VCO conversations. In response to this, the unit will send the "Line Disconnected" status.

Text (sent to/received from TDD caller)

Text typed by the TDD caller is transmitted to the CAD in upper case ASCII characters only, even if the caller himself is in ASCII mode typing lower case characters. If the unit CAD port is in half-duplex mode, the text typed by the call taker via the CAD is transmitted back to the CAD in lower case characters even if the call taker is typing upper case. In most cases all lower case characters typed by the call taker are received by the caller in upper case characters.

When the Model 3030 is in the Baudot mode it should only receive Baudot compatible characters from the CAD system. If the unit receives non-Baudot characters while in Baudot mode it will ignore them (in half-duplex mode it will not echo them). The list of supported Baudot characters is at the end of this document.

Text typed by the TDD caller is typically slow and messages sent by the caller may take a long time to complete. Carriage return is often not used by the caller. Because a life may be at stake based on the text being sent by both parties it is essential that both parties see the text as it is being typed. For this reason no "blocking" or "packeting" of text is performed. Text received from the caller is sent a character at a time to the CAD and text should be sent a character at a time from the CAD as the call taker types. Should, for some reason, buffers begin to fill on either the CAD or the Model 3030 it will receive or send XON/XOFF for flow control.

All control codes compatible with the mode being used are sent transparently between the caller and the call taker (CAD) except XON, XOFF, and SOH which are filtered out of the communications between the caller TDD and the Model 3030 because of their dedicated use between the CAD and the Model 3030.

Operation

A typical TDD call sequence operates as follows:

1. The CAD call taker performs a "hot key" sequence to switch the CAD to the TDD task.
2. The CAD sends an "answer line/interrogate" command to the Model 3030.
3. The Model 3030 sends the "Line answered/interrogating" status to the CAD.
4. If a TDD call is detected the Model 3030 sends the "Connected in Baudot Mode" or "Connected in ASCII Mode" status to the CAD depending on the mode used by the TDD caller.
5. If a TDD call is not detected after a timeout period the Model 3030 sends to the CAD the "Interrogation Timeout" status followed by the "Line Disconnected/Reset" status.
6. The CAD sends text to the caller by sending ASCII characters to the Model 3030 (the Model 3030 translates these to Baudot for sending to the caller if necessary). No special characters are necessary to switch the Model 3030 between transmitting to the caller and receiving from the caller, however certain typing

protocols should be used between the caller and the call taker in order to inform the party at the other end that it is their turn to type.

7. The caller sends text to the CAD via the Model 3030. No matter what mode is used by the caller, the Model 3030 sends ASCII characters to the CAD.

8. The iteration of steps 6 & 7 continue until all needed info is gathered.

9. The call taker initiates a task switch back to normal CAD functions upon which the CAD issues a "Line Disconnect/Reset" command to the Model 3030.

10. The Model 3030 upon receiving the "Line Disconnect/Reset" command or upon an inactivity timeout sends the "Line Disconnected/Reset" status to the CAD.

Baudot Codes

Table 4. CAD ASCII Characters Supported In Baudot Mode

Class	Includes
Letters	A through Z (upper case only)
Numbers	0 through 9
Figures	? : $! & # ' ( ) . , ; / " SPACE
Control Signals	BEL, CR, LF, NUL

Note The Baudot code also has letter shift and figure/number shift characters. The Model 3030 will automatically insert these shift characters in the data sent to the TDD caller.

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