# TA201C DATA MODEM
# DESCRIPTION AND OPERATION

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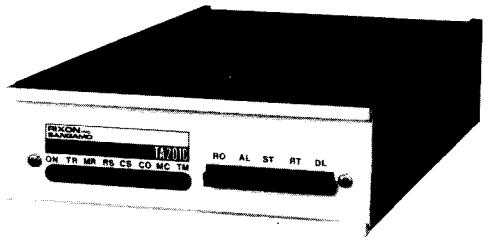
## 1. GENERAL

### A. Introduction

1.01 This section consists of information on features, accessories, configurations, and specifications of the RIXON® TA201C Data Modem. A brief functional description and detailed operating procedures are also provided for the TA201C Data Modem shown in Fig. 1-1.

1.02 This section is being reissued to reflect the following new information:

- Addition of AE186 telephone in Table 1-B and in telephone operating procedures.
- Addition of part number for new cable to interconnect the data modem and 500-type telephone in Table 1-B.




2155-K

Fig. 1-1. TA201C Data Modem

**1.03** The TA201C Data Modem is a medium-speed, Phase-Shift Keyed (PSK), modulator/demodulator (modem). It provides synchronous serial binary data transmission over voice-grade Type 3002 channels at a data rate of 2400 bits per second. It is also used over the Direct-Distance-Dial (DDD) telephone network (dial network) when connected via internal line control circuitry.

**1.04** The data modem is available in four basic configurations. The private line and DDD versions of the TA201C are supplied in a desktop enclosure. The private line version of the CA201C card set is used in the RM40B1A (series 2) Data Mounting, part number 905-5071-01. The DDD version of the CA201C card set is used in the RM40A3 Data Mounting, part number 905-5096-01. See Table 1-A for configuration part number information.

**1.05** Unless a specific difference between the TA201C and CA201C is being referred to, this manual uses the TA201C designation in general.

## B. Data Modem Features

**1.06** The data modem has many outstanding features. The following is a list of some of the main features:

- Large Scale Integrated (LSI) and hybrid circuitry for improved reliability and reduced size.
- End to end compatibility with Western Electric 201B and 201C, and RIXON T201B and TA201B Data Modems.
- Two-wire half-duplex or four-wire full-duplex operation.
- Compatible with Western Electric 801A or 801C Automatic Calling Unit (ACU).
- EIA RS-232-C, contact, and CCITT recommendation V.24 interface (slightly modified).
- High tolerance to phase jitter, frequency translation, and other line impairments.

**TABLE 1-A**

**TA201C CONFIGURATIONS**

| PART NO.<br>DASH NO. | 905-5085<br>-001 | 905-5085<br>-002 | 905-5085<br>-003 | 905-5085<br>-004 | 905-5085<br>-007 | 905-5085<br>-008 |
|---|---|---|---|---|---|---|
| MODEL NO.<br>LIST NO. | TA201C<br>L1C/1D | CA201C<br>L1C/1D | TA201C<br>L1D | CA201C<br>L1D | TA201C<br>L1C/1D | TA201C<br>L1D |
| FEATURES | | | | | | |
| Desk-top enclosure with 120 Vac transformer | X | | X | | | |
| Desk-top enclosure with 220 Vac transformer | | | | | X | X |
| Card only | | X | | X | | |
| Private line or DDD applications | X | X | | | X | |
| Private line applications only | | | X | X | | X |

- Differentially coherent four-phase modulation.
- Crystal controlled internal transmit clock.
- Dibit encoding for narrow line spectrum.
- Self-contained compromise delay equalizer.

### C. Data Modem Accessories

**1.07** Figure 1-2 shows accessories available for use with the data modem. Table 1-B provides a list of accessory part numbers. Unless specified in the table this equipment is optional. When not purchased with the data modem it is available from Rixon Inc.

## 2. PHYSICAL DESCRIPTION

### A. Configurations

**2.01** The data modem is available in four basic configurations:

- CA201C-L1D private line card set for use in multimodem RM40B1A rack mount.
- CA201C-L1C/1D private line and DDD card set for use in multimodem RM40B1A (private line) rack mount.
- CA201C-L1C/1D private line and DDD card set for use in multimodem RM40A3 (DDD) rack mount.

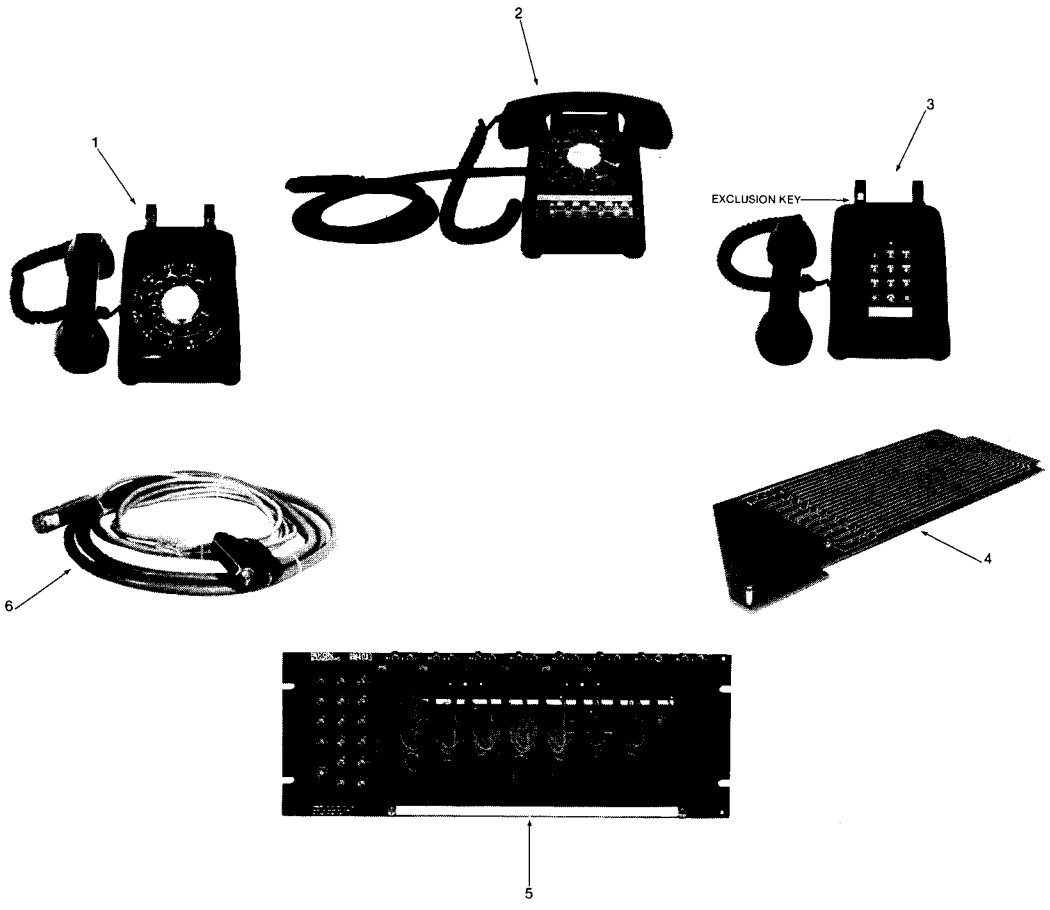



**Fig. 1-2. Data Modem Accessories**

- TA201C-L1D private line card set plus standalone enclosure, stepdown transformer, power cord, and interface connectors.

- TA201C-L1C/1D private line and DDD card set plus standalone enclosure, step-down transformer, power cord, and interface connectors.

**2.02** The CA201C-L1D or -L1C/1D card set is 1.4 in. (3.6 cm) high, 5.6 in. (14.2 cm) wide, 10.5 in. (26.6 cm) deep, and weighs approximately 1.2 lb. (0.5 kg). The TA201C-L1D or -L1C/1D standalone enclosure is 2.3 in. (5.8 cm) high, 5.8 in. (14.7 cm) wide, 11.4 in. (29.0 cm) deep, and weighs approximately 5 lb. (2.25 kg).

## B. Specifications

**2.03** A list of mechanical and electrical specifications for the TA201C Data Modem is provided in Table 1-C.

**TABLE 1-B**

**ACCESSORY DESCRIPTIONS AND PART NUMBERS**

| FIG. 1-2 REF. NO. | DESCRIPTION | RIXON PART NO. |
|---|---|---|
| 1 | 500 telephone with rotary dial and isolated hookswitch contact capability. | 385-0500-100 |
| — | 2500 telephone with tone dial and isolated hookswitch contact capability (not shown). | 385-2500-100 |
| 2 | 565 telephone with rotary dial. | 385-0565-044 |
| — | 2565 telephone with tone dial (not shown). | 385-2565-044 |
| 3 | 2503 (RTC) with tone dial.<br>503 (RTC) with rotary dial (not shown). | Not supplied by Rixon. |
| — | AE186 (HC8666000ASL) telephone with rotary dial (not shown).<br>AE186 (HC8666000JSL) telephone with tone dial (not shown). | Not supplied by Rixon. |
| 4 | Extender card. | 905-6330-01 |
| 5 | RM40A3 multiple data modem mounting for DDD applications. (Refer to RM40A3 Data Mounting Manual, 5243 for further information). | 905-5096-XX |
| — | RM40B1A multiple data modem mounting for private line applications. (Not shown. Refer to RM40B1A Data Mounting Manual, 5217 for further information). | 905-5071-XX |
| — | DM44R2 single modem and single 829 card data modem mounting for private line applications. (Not shown. Refer to DM44R2 Data Mounting Manual, 5270 for further information). | 905-5072-02 |

**TABLE 1-B (Cont)**

**ACCESSORY DESCRIPTIONS AND PART NUMBERS**

| FIG. 1-2 REF. NO. | DESCRIPTION | RIXON PART NO. |
|---|---|---|
| 6 | 565 or 2565 telephone, data modem, and DDD network interconnecting cable, | |
| | — for 0 dBm transmit level applications (Not registered). | 905-6414-01 |
| | — for fixed loss loop applications. | 905-6414-02 |
| | — for programmable applications. | 905-6414-03 |
| | — for adjustable transmit level applications (Not registered). | 905-6414-04 |
| | — for permissive level applications. | 905-6414-05 |
| — | Data modem connecting cable, automatic answer without a telephone, | |
| | — for adjustable transmit level applications with spade lugs. | 905-4962-03 |
| | — for programmable applications. | 905-6557-01 |
| | — for fixed loss loop applications. | 905-6557-02 |
| | — for permissive applications. | 905-6557-03 |
| — | Data modem connecting cable, provides a talk/data switch for use with a standard 500 telephone, | |
| | — for programmable applications, with data lamp. | 905-6592-01 |
| | — for fixed loss loop applications. | 905-6592-02 |
| — | Data modem connecting cable, provides a data switch for use with a 500 telephone (with isolated hookswitch contacts), | |
| | — for programmable applications, with data lamp. | 905-6608-01 |
| | — for fixed loss loop applications. | 905-6608-02 |
| — | Data modem connecting cable, provides a data switch for use with a 500 telephone (with isolated hookswitch contacts), | |
| | — for permissive applications. | 905-6609-01 |
| | — for permissive applications, with data lamp. | 905-6609-02 |
| — | Data modem connecting cable, provides a talk/data switch for use with a standard 500 telephone, | |
| | — for permissive applications. | 905-6611-01 or 905-6675-01 |
| | — for permissive applications, with data lamp. | 905-6611-02 |
| — | Data modem connecting cable to 565 telephone and 801C L1/2 ACU, | |
| | — for adjustable applications, with spade lugs (Not registered). | 905-6630-01 |
| | — for fixed loss loop applications. | 905-6630-02 |
| | — for programmable applications. | 905-6630-03 |
| | — for adjustable applications, with Telco jack (Not registered). | 905-6630-04 |
| | — for permissive applications. | 905-6630-05 |

**TABLE 1-C**

**LIST OF SPECIFICATIONS**

| ITEM | SPECIFICATION |
|---|---|
| Input data format | Serial, binary, synchronous. |
| Operational mode | Two-wire half duplex or four-wire full duplex. |
| Transmission speed | 2400 bps. |
| Timing | Internal or external (strappable), internal transmit timing — crystal controlled 2400 Hz (±.005%) square wave with no more than 0.5% peak distortion delivered to transmit interface. External transmit timing — supplied by business machine to transmit interface, crystal controlled 2400 Hz (±0.01%) square wave with 50 (±0.05)% duty cycle. Receive timing — recovered from data spectrum and delivered to receive interface. |
| Modulation | Differentially coherent four-phase (PSK). |
| Carrier frequency | 1800 Hz (±0.005%). |
| Line requirement | Switched DDD network or private line (FCC Tariff 260 Type 3002 line). |
| Line impedance | 600 or 900 ohms (strappable). |
| Transmit signal level | 0 to -15 dBm in 1-dB steps (strappable for private line installations or 0 to -12 dBm (programmable) for DDD installations. |
| Post compromise equalizer | Compensates for delay and amplitude distortion encountered on average circuit. |
| Carrier-on sensitivity | Two-wire DDD operation: -44dBm.<br>Two- or four-wire private line operation: -24 dBm. |
| New sync | Provides rapid receiver resynchronization (less than 10 ms). |
| Echo delay | Inhibits receiver 100 ms after end of transmission for two-wire operation. |
| Clear To Send delay | Inhibits data transmission for 0, 7, or 150 ms (strappable) after application of request-to-send signal. |
| Power requirements | 120 VAC (±10%), 57-63 Hz, 10 watts,or<br>220 VAC (±10%), 50 Hz, 10 watts. |
| Operating temperature | 0° to 50° C. |

**TABLE 1-C (Cont)**

**LIST OF SPECIFICATIONS**

| ITEM | SPECIFICATION |
|---|---|
| Humidity | 0 to 95% at 25° C; noncondensing. |
| Dimensions: | |
| Height | 2.3 in. ( 5.8 cm). |
| Width | 5.8 in. (14.7 cm). |
| Depth | 11.4 in. (29.0 cm). |
| Weight: | |
| Net | 5 lb (2.25 kg). |
| Shipping | 9 lb (4.05 kg). |

## 3. FUNCTIONAL DESCRIPTION

**3.01** The TA201C-L1C/1D and CA201C-L1C/1D Data Modems are versatile and can be used as either DDD or private line data modems. Conversion from DDD to private line operation is possible via option installations. The TA201C-L1D and CA201C-L1D Data Modems can only be used as private line data modems.

**3.02** The four basic components of both the List 1C/1D and List 1D data modems are the main card, analog card, digital card, and power supply. Each of these components, except the main cards are interchangeable between the List 1C/1D and the List 1D. The main card for the List 1C/1D (part number 905-6594-01) contains both private line and DDD line control and interface circuitry. The main card for the List 1D (part number 905-6594-02) contains only private line interface circuitry.

## 4. DATA MODEM LAMPS

**4.01** The status lamps shown in Fig. 1-3 monitor interface and control circuits and are used for rapid fault isolation. Labeling and functioning of the lamps is as follows:

- ON — (Power On) Indicates power is applied to data modem. Lamp connects to + 12-volt supply.
- TR — (Terminal Ready) Shows status of Data Terminal Ready signal from data terminal interface.
- MR — (Modem Ready) Indicates status of Data Set Ready signal. Lamp is normally lighted when data modem is operating on private lines. When data modem is operating over switched network, lamp is lighted when station is in data mode.
- RS — (Request To Send) Shows status of Request To Send signal from data terminal interface. Lamp is lighted during data transmission.
- CS — (Clear To Send) Indicates status of Clear To Send signal from data modem. Lamp is lighted during data transmission.
- CO — (Carrier On) Shows status of receive carrier detector.
- MC — (Modem Check) During normal operation, lamp indicates absence of receiver bit clock at data terminal interface. Lamp should be lighted when carrier-on is off, and should be off when carrier-on is on.
- TM — (Test Mode) Indicates data modem is in a test mode. Lamp lights if AL, ST, RT, or DL switch is pressed. Lamp is off during normal operation.

**NOTE:** *Test pushbuttons must be in released (out) position during normal operation.*

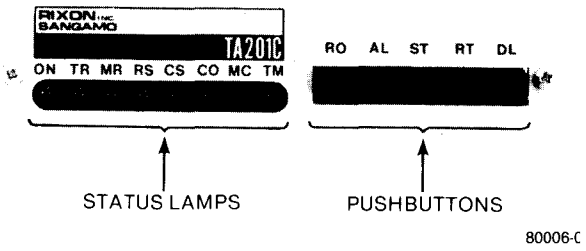



**Fig. 1-3. Data Modem Lamps and Pushbuttons**

## 5. PRIVATE LINE OPERATION

### A. Introduction

**5.01** The TA201C Data Modem may be operated on two-wire or four-wire private line facilities. A RIXON T829 DAS may also be used on four-wire private line facilities.

### B. Operating with a T829 DAS

**5.02** The T829 DAS and TA201C private line data modem is designed for operation on channels of 16-dB end-to-end loss with data modem transmit level set at 0 dBm. Two line pairs for four-wire transmission are provided. The line status pair is controlled by a normally closed relay contact and provides a signal at the telephone/line interface (TEK 5 and TEK 6) that can be used by the data modem to control the Data Set Ready (DTE connector pin 6) signal. An open line status pair represents a not-in-data-mode indicator while the T829 is in optional facility loopback.

**5.03** A single C829 may be housed in either a DM44A1/T or, with a CA201C, in a DM44R2 enclosure. Multiple housing for as many as eight separate C829 Cards is provided by an RM46A1 Data Mounting.

### C. Operating with Alternate Voice and Dial Backup Units

**5.04** When either alternate voice or dial backup operation is required a DM45R1 is used. It houses a C829 Card and either a C48A1 AVU or C48B1 DBU.

**5.05** When both alternate voice and dial backup operations are required a DM45A1 is used. It houses a C829 Card and both a C48A1 AVU and C48B1 DBU. For further information on DM44A1, DM44A1T, DM46A1, DM45R1, and DM45A1 see applicable Installation and Maintenance Manuals.

## 6. DDD OPERATION

### A. Introduction

**6.01** The TA201C Data Modem may be used with the following telephone and cable arrangements to provide a variety of voice/data applications on the DDD switched telephone network:

- A 565, 2565 or AE186 telephone and appropriate DDD cable provide normal voice communication, manual data call origination, manual or automatic answering, and manual or automatic answering under control of the data terminal. This arrangement is for applications requiring manual origination, manual answering, or automatic answering of data calls. The 565 or 2565 or AE186 telephone can be modified to inhibit the automatic answer feature.

- A 500 or 2500 telephone and three-position cable switch provides manual call origination and automatic answering. This arrangement is for applications where, for example, the telephone is used for normal voice or manual data call origination during the day, and after hours for unattended automatic answering of data calls. The switch on the DDD cable can be left in the VOICE ONLY position to inhibit the automatic answer feature. This arrangement is not designed for talk to data transfer of a manually answered call.

- A 500 or 2500 telephone (with isolated hookswitch contacts), and two-position cable switch provide manual data call origination and automatic answering or automatic answering under control of the data terminal. This arrangement is used in applications requiring voice communication, data call origination, and automatic answer. This arrangement is not designed for talk to data transfer of a manually answered call.

- An RTC (503 or 2503) telephone and appropriate DDD cable provide manual origination and automatic answering of

data calls. This arrangement is for applications requiring voice communication, data call origination, and automatic answer. This arrangement does not provide for manual inhibit of the automatic answer feature.

- An Automatic Calling Unit (ACU) provides terminal equipment initiated dialing. An ACU may be operated with a TA201C and either with or without a telephone.

- Applications for data-only answer-only service do not require a telephone when the data modem is optioned for automatic answer.

**NOTE:** *A telephone which uses line pushbuttons to select one or more data lines is referred to in this manual as a multiple line telephone. The multiple line telephones used in this manual include the 565, 2565, and AE186 telephones. A 2 at the beginning of the 2565 telephone model number designates a tone dial telephone. An A in the AE186 telephone manufacturers part number (HC8666000ASL) designates a rotary telephone, a J in (HC8666000JSL) designates a tone dial telephone. Since both rotary and tone dial telephones interact with the TA201C in the same manner, the rotary dial telephones referred to in the following operating procedures denote either type.*

**6.02** The data modem is equipped with an optional originate mode abort timer when used with an RTC telephone. The abort timer automatically drops the telephone line after 20 (±4) seconds if the data modem does not detect carrier from the remote data modem or a Request To Send from the local data terminal.

### B. Operating with a Multiple Line Telephone

**6.03** As shown in Fig. 1-4 the 565 telephone has six pushbuttons. The first (DATA) pushbutton on the extreme left is nonlocking and releases any of the other five pushbuttons when it is pressed and released to enter data mode. The remaining five (LINE) pushbuttons are used to select the required data line. The telephone can be wired to provide manual inhibit of the automatic answer feature.

**NOTE:** *The AE186 telephone has five line pushbuttons and one hold pushbutton. After performing the modification described in the 200 section, the hold pushbutton is nonlocking and functions in the same manner as the 565 DATA pushbutton. Therefore, the following references to the 565 may be used to denote either multiple line telephone.*

#### Manually Originating

**6.04** The following procedures are for manually originating data calls using a 565 telephone and appropriate DDD cable:

(a) Verify that data modem ON lamp is lighted indicating data modem power is on.

(b) Press appropriate telephone LINE key, lift handset, and dial call in normal manner.

(c) After call is answered, verify that data modem TR lamp is lighted.

(d) If remote site answers manually, request attendant to enter data mode first. If remote site answers automatically, enter data mode upon receipt of answer tone.

**NOTE:** *Transfer to data mode must take place within sixteen seconds after answer tone begins.*

(e) To enter data mode, press DATA key until LINE key lights.

(f) Verify that data mode has been entered (MR lamp lighted) and the telephone LINE key releases as DATA key is released.

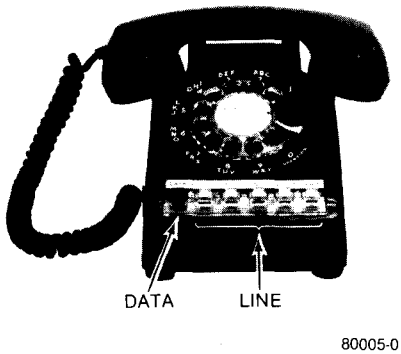



**Fig. 1-4. 565 Telephone and Controls**

(g) Place telephone handset on hook.

(h) Data transmission can begin.

**Manually Answering**

**6.05** The following procedure is for manually answering data calls using a 565 telephone and appropriate DDD cable:

(a) When telephone rings, press LINE key that lights during ringing.

(b) Lift handset off hook and answer in the usual manner.

(c) Verify that data modem ON lamp is lighted indicating data modem power is on.

(d) Verify that data modem TR lamp is lighted.

(e) When ready to enter data mode, press DATA key until the LINE key lights.

(f) Verify that data mode has been entered (MR lamp lighted) and the telephone LINE key releases as DATA key is released.

(g) Place telephone handset on hook.

(h) Data transmission can begin.

**Automatically Answering**

**6.06** The following procedure is for automatically answering data calls using a 565 telephone and appropriate DDD cable:

(a) Verify that the data modem is optioned for automatic answer.

(b) Ensure that data modem ON lamp is lighted indicating data modem power is on.

(c) Verify data modem TR lamp is lighted.

(d) When data modem is in the data mode, the telephone LINE key and the data modem TR and MR lamps are lighted.

**Data to Talk Transfer**

**6.07** The following procedure is used when transferring from data to talk mode in the 565 configuration:

(a) Lift handset off hook and press LINE key.

(b) Verify that LINE key lamp goes out.

(c) Data modem is now in talk mode. If additional transmission is required, return to data mode by following the procedures described in Manually Originating and Manually Answering.

**Terminating a Data Call**

**6.08** After the transmission is completed the data call can be terminated in one of the following ways:

- To manually disconnect, lift handset off hook, press the LINE key, and replace the handset on hook.

- If voice communication is not required after data transmission, the call can be terminated automatically by ensuring that the Data Terminal Ready leads (CD) are turned off at both sites.

## C. Operating a Multiple Line Telephone Modified for Auto-Answer Inhibit

**6.09** When automatic answer is required, the data modem is normally optioned for permanent automatic answer. However, it may be desirable to selectively block incoming calls. In single-line applications, this may be done by installing the automatic answer option in the data modem, and using a multiple line telephone modified for auto-answer inhibit. For modification procedure refer to the Installation and Connection section (200) of this manual. Operation of auto-answer inhibit telephones is identical to operation of an unmodified telephone with the following exceptions:

- Use only in single-line applications.

- If calls are to be selectively auto-answered during attended operations, automatic answer must be controlled by Data Terminal Ready signal from the terminal.

- First LINE key is released for automatic answer and pressed for normal operation.

- When returning to voice mode the telephone handset must be placed off hook before pressing LINE key.

- When terminating a data call leave handset on hook and press LINE key.

R E A D — Multiple line telephones which are modified for auto-answer inhibit cannot be installed behind a PBX or where isolated hookswitch contacts are used. Incoming calls may always see a busy line.

### D. Operating with a 500 Telephone and Two-Position Cable Switch

**6.10** The 500 telephone shown in Fig. 1-5 is used in conjunction with a DDD cable with a two-position toggle switch. The normal (up) position provides normal voice communications, manual call origination, and automatic answer for a properly optioned TA201C. The DATA (down) position (nonlocking) is used to transfer normal originated voice calls to data mode.

**NOTE:** *When using a DDD cable with a two-position toggle switch, the 500 telephone must be equipped with isolated hookswitch contacts.*

#### Manually Originating

**6.11** The following procedure is for manually originating data calls using a 500 telephone and two-position DDD cable switch:

(a) Verify that data modem ON lamp is lighted indicating data modem power is on.

(b) Lift telephone handset off hook and dial call in normal manner.

(c) After call is answered verify that data modem TR lamp is lighted.

(d) If remote site answers manually, request attendant to enter data mode first. If remote site answers automatically, enter data mode upon receipt of answer tone.

**NOTE:** *Transfer to data mode must take place within sixteen seconds after answer tone begins.*

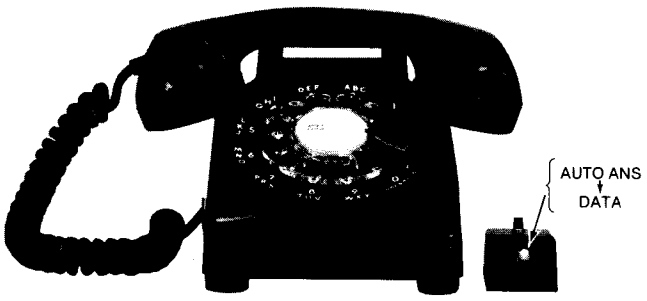



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**Fig. 1-5. 500 Telephone and Two-Position Cable Switch**

(e) To enter data mode, press and hold cable switch to the DATA position while placing the telephone handset on hook. After data modem MR lamp lights, release the cable switch.

**NOTE:** *Some versions of the DDD cable switch have a DATA lamp to indicate when the data modem has entered the data mode. This lamp can be used in place of the data modem MR lamp to indicate when to release the cable switch.*

(f) Data transmission can begin.

#### Automatically Answering

**6.12** The following procedure is for automatically answering data calls using a 500 telephone and appropriate DDD cable:

(a) Verify that data modem is optioned for automatic answer.

(b) Verify that data modem ON lamp is lighted indicating data modem power is on.

(c) Verify that data modem TR lamp is lighted.

(d) When the data modem is in the data mode, the data modem MR lamp is lighted.

### Terminating a Data Call

**6.13** After the transmission is completed the data call can be terminated in one of the following ways:

- To manually disconnect, lift telephone handset off hook momentarily, and then replace on hook. The attendant at the remote site should follow the same procedure to ensure data call termination. If prearranged, voice communication is possible before replacing the telephone handset on hook.

- The call can be terminated automatically when the Data Terminal Ready leads (CD) are turned off at both sites.

## E. Operating with a 500 Telephone and Three-Position Cable Switch

**6.14** The 500 telephone as shown in Fig. 1-6 is used in conjunction with a DDD cable with a three-position toggle switch. The VOICE ONLY (up) position of the switch inhibits (manual or automatic) answering of data calls. The ALT VOICE/DATA AUTO ANS (center) position permits the TA201C (if optioned for automatic answer) to automatically answer incoming data calls under control of the data terminal equipment. The DATA (down) position (nonlocking) is used to transfer normal originated voice calls to data mode.


**Fig. 1-6. 500 Telephone and Three-Position Cable Switch**

### Manually Originating

**6.15** The following procedure is for manually originating data calls using a standard 500 telephone and three-position DDD cable switch:

(a) Verify that data modem ON lamp is lighted indicating data modem power is on.

(b) Lift telephone handset off hook and dial call in normal manner.

(c) After call is answered verify that data modem TR lamp is lighted.

(d) If remote site answers manually, request attendant to enter data mode first. If remote site answers automatically, enter data mode upon receipt of answer tone.

**NOTE:** *Transfer to data mode must take place within sixteen seconds after answer tone begins.*

(e) To enter data mode, press and hold cable switch to the DATA position while placing the telephone handset on hook.

(f) Release VOICE/DATA cable switch.

(g) After data modem MR lamp lights, data transmission can begin.

**NOTE:** *Some versions of the DDD cable VOICE/DATA switch have a DATA lamp to indicate when the data modem is in the data mode.*

### Automatically Answering

**6.16** The following procedure is for automatically answering data calls using a 500 telephone and three-position DDD cable switch:

(a) Verify that data modem is optioned for automatic answer.

(b) Place cable switch to ALT VOICE/DATA AUTO ANS (center) position.

(c) Verify that data modem ON lamp is lighted indicating data modem power is on.

(d) Verify that data modem TR lamp is lighted.

(e) When the data modem is in the data mode, the data modem MR lamp is lighted.

**Terminating a Data Call**

**6.17** After the transmission is completed, the data call can be terminated in one of the following ways:

- To manually disconnect, momentarily lift the telephone handset off hook and replace it on hook. The attendant at the remote site should follow the same procedure to ensure data call termination. If prearranged, voice communication is possible prior to placing the telephone handset on hook.

- The call can be terminated automatically when the Data Terminal Ready leads (CD) are turned off at both sites.

## F. Operating with an RTC Telephone

**6.18** The RTC telephone as shown in Fig. 1-7 is equipped with an exclusion key. Lifting the telephone handset off hook and pulling up the exclusion key provides normal voice communication and manual data call origination. Replacing the handset on hook returns the exclusion key and terminates the voice call provided Data Terminal Ready (CD) is off. With Data Terminal Ready on, replacing the handset places the modem in the data mode.

**Manually Originating**

**6.19** The following procedure is for manually originating data calls using an RTC telephone and appropriate DDD cable:

(a) Verify that data modem ON lamp is lighted indicating data modem power is on.

(b) Lift telephone handset off hook, pull up exclusion key, and dial call in normal manner.


**Fig. 1-7 RTC Telephone and Control**

(c) After call is answered verify that data modem TR lamp is lighted.

(d) If remote site answers manually, request attendant to enter data mode first. If remote site answers automatically, enter data mode upon receipt of answer tone.

**NOTE:** *Transfer to data mode must take place within sixteen seconds after answer tone begins.*

(e) To enter data mode, place the telephone handset on hook.

(f) After data modem MR lamp lights, data transmission can begin.

**Manually Answering**

**6.20** The following procedure is for manually answering data calls using an RTC telephone and appropriate DDD cable:

(a) When telephone rings, lift handset off hook, pull up the exclusion key, and answer in the usual manner.

(b) Verify that data modem ON lamp is lighted indicating data modem power is on.

(c) Verify that the data modem TR lamp is lighted.

(d) When ready to enter data mode, place telephone handset on hook.

(e) After data modem MR lamp lights, data transmission can begin.

**Automatically Answering**

**6.21** The following procedure is for automatically answering data calls using an RTC telephone and appropriate DDD cable:

(a) Verify that the data modem is optioned for automatic answer.

(b) Verify that data modem ON lamp is lighted indicating data modem power is on.

(c) Verify data modem TR lamp is lighted.

(d) When the data modem is in the data mode, the data modem MR lamp is lighted.

**Data to Talk Transfer**

**6.22** The following procedure is used when transferring from data to talk mode in an RTC configuration:

(a) Lift telephone handset off hook and pull up on the exclusion key.

(b) Verify that the MR lamp goes out.

(c) Data modem is now in the talk mode. If additional data transmission is required, the answering modem must return to the data mode first. Ensure that the TR lamp is lighted and then place the telephone handset on hook.

**Terminating a Data Call**

**6.23** After the transmission is completed, the data call can be terminated automatically when the Data Terminal Ready leads (CD) are turned off at both sites.

## G. Operating with an Automatic Calling Unit

**6.24** An 801A (pulse dial) or 801C (tone dial) Automatic Calling Unit (ACU) can be used with the data modem to automatically originate a data call. The business machine must be programmed to provide dialing information directly to the ACU and to control the interface functions of the data modem.

## H. Operating without an Automatic Calling Unit or Telephone

**6.25** When operating as an answer-only installation, the TA201C can be used without an ACU or telephone. In this type of installation the data modem automatically answers data calls and operates under complete control of the data terminal equipment.

## 7. REFERENCES

**7.01** The following publications provide additional information for standalone and multiple installations using a TA201C Data Modem.

| SECTION | TITLE |
|---|---|
| 5214-200 | TA201C Data Modem Installation and Connection |
| 5214-300 | TA201C Data Modem Self-Diagnostics |
| 5214-500 | TA201C Data Modem Tests Using External Test Equipment |
| 5225 | TA201C Users Manual |
| 5219 | TA201C Maintenance Manual |
| 5462 | T829 Users Manual |