

**INSTALLATION AND  
OPERATION MANUAL**

**SANGAMO  
T101CSC  
DATA SET  
SYSTEM**

**SANGAMO ELECTRIC COMPANY  
COMMUNICATION SYSTEMS  
SPRINGFIELD, ILLINOIS 62714  
217-544-6411**

INSTALLATION  
AND  
OPERATION MANUAL

RIXON—SANGAMO  
T101CSC  
SERIES  
DATA SET  
SYSTEM

Rixon, Inc.

A Subsidiary of Sangamo

2120 Industrial Parkway

Silver Spring, Maryland 20904



## INTRODUCTION

This manual contains the information necessary to install and operate the various T101CSC Data Set Systems, manufactured by Sangamo Electric Company, in conjunction with the teletypewriter and data access arrangement (DAA). Instructions are also provided for teletypewriter modification. For maintenance and troubleshooting assistance, contact the Communication Systems Data Service Center, Sangamo Electric Company, Springfield, Illinois. The information provided by this manual is grouped into four sections. A brief description of each section is provided below:

- |            |  |            |   |
|------------|--|------------|---|
| <b>1-0</b> | <b>GENERAL DESCRIPTION</b> – Provides general information about data set and auxiliary equipment. Describes the various applications for the different data set systems in the | <b>2-0</b> | <b>INSTALLATION AND CONNECTION</b> – Supplies detailed procedures for unpacking, installing, and connecting the different data set systems. Also provides teletypewriter modification procedures. |
|            |  | <b>3-0</b> | <b>OPERATION</b> – Describes the complete procedures for operating the different data set systems with the various teletypewriters.   |
|            |  | <b>4-0</b> | <b>DRAWINGS AND DIAGRAMS</b> – Furnishes the connection diagrams for each data set system when connected to either a CBS or CBT DAA and the various teletypewriters.                              |

series. A list of equipment specifications is also included.



# TABLE OF CONTENTS

Section	Title	Page
<b>1-0</b>	<b>GENERAL DESCRIPTION</b>	
1-1	Introduction . . . . .	1-1
1-2	Application . . . . .	1-1
1-3	Features . . . . .	1-1
1-4	Physical Description . . . . .	1-2
1-5	Auxiliary Equipment . . . . .	1-2
1-6	General Specifications . . . . .	1-2
<b>2-0</b>	<b>INSTALLATION AND CONNECTION</b>	
2-1	Introduction . . . . .	2-1
2-2	Unpacking . . . . .	2-1
2-3	Returning Data Set System To Factory . . . . .	2-1
2-4	Teletypewriter Disassembly . . . . .	2-1
2-4-1	Model 28 Disassembly . . . . .	2-1
2-4-2	Model 33 Disassembly . . . . .	2-1
2-4-3	Model 35 Disassembly . . . . .	2-3
2-5	Teletypewriter Modification . . . . .	2-3
2-5-1	Model 28 Modification . . . . .	2-3
2-5-2	Model 33 Modification . . . . .	2-9
2-5-3	Model 35 Modification . . . . .	2-10
2-6	Data Set Option Description . . . . .	2-15
2-7	Data Set Option Installation . . . . .	2-15
2-8	Data Set System Modification For Special Applications . . . . .	2-18
2-9	Data Set System Installation For Model 28 Teletypewriters . . . . .	2-18
2-9-1	Telephone Handset Installation . . . . .	2-18
2-9-2	Mounting Bracket Installation . . . . .	2-18
2-9-3	Dial Assembly Installation . . . . .	2-18
2-9-4	Data Set Installation . . . . .	2-18
2-10	Data Set System Installation For Model 33 Teletypewriter . . . . .	2-18
2-10-1	Telephone Handset Installation . . . . .	2-18
2-10-2	Mounting Bracket Installation . . . . .	2-26
2-10-3	Dial Assembly Installation . . . . .	2-27
2-10-4	Data Set Installation . . . . .	2-27
2-11	Data Set System Installation For Model 35 Teletypewriter . . . . .	2-27
2-11-1	Telephone Handset Installation . . . . .	2-27
2-11-2	Mounting Bracket Installation . . . . .	2-27
2-11-3	Dial Assembly Installation . . . . .	2-27
2-11-4	Data Set Installation . . . . .	2-27
2-12	Data Set System Installation For Model 38 Teletypewriter . . . . .	2-28
2-12-1	Telephone Handset Installation . . . . .	2-28
2-12-2	Mounting Bracket Installation . . . . .	2-28
2-12-3	Dial Assembly Installation . . . . .	2-30
2-12-4	Data Set Installation . . . . .	2-30



## TABLE OF CONTENTS (CONT.)

Section	Title	Page
2-13	Data System Connection . . . . .	2-30
2-14	Teletypewriter Reassembly . . . . .	2-30
2-15	Call Control Panel Installation . . . . .	2-30
2-16	Operational Test . . . . .	2-30
<b>3-0</b>	<b>OPERATION</b>	
3-1	Introduction . . . . .	3-1
3-2	Originating A Data Call . . . . .	3-1
3-3	Answering A Data Call . . . . .	3-1
3-4	Normal Operation . . . . .	3-1
3-5	Terminating A Data Call . . . . .	3-2
3-6	Alternate Voice Communication . . . . .	3-2
3-7	Local Mode Operation . . . . .	3-2
3-8	Out of Service Mode Conditions . . . . .	3-2
<b>4-0</b>	<b>DRAWINGS AND DIAGRAMS</b>	
4-1	Introduction . . . . .	4-1



Figure 1-A. T101CSC Data Set

## 1-0 GENERAL DESCRIPTION

### 1-1 INTRODUCTION

This section describes the applications, features, and physical characteristics of the T101CSC series data set systems (figure 1-A). It also provides a list of general electrical and mechanical specifications.

### 1-2 APPLICATION

The data set system is a completely solid state, frequency shift keyed (FSK) transmitter/receiver (modem). It transmits and receives asynchronous, serial, binary data at speeds up to 200 bits per second (100 words per minute) over the DDD network via a CBS or CBT DAA. It operates with a Model 28, 33, 35 or 38 teletypewriter using a UCC 6 call control unit. Alternate voice/data communication is provided by the control panel, dial assembly, and handset supplied. Figure 1-B describes the available options and differences between the various data set systems in the T101CSC series.

### 1-3 FEATURES

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

- \* Compact unit construction
- \* End-to-end compatibility with Western Electric 101C series data sets
- \* Two-wire, full duplex operation
- \* 20-milliampere or EIA voltage interface
- \* Modular design with all solid state circuitry contained on two plug-in cards

Part Number*	558	558	558	558	558	560	560	560	560
Dash Number	001	101	002	102	003	001	103	002	104
Series Number	0	0	0	0	0	0	0	0	0
Features	Configuration								
T101CSC Data Set	X	X	X	X	X	X	X	X	X
Rotary dial Tone dial	X	X	X	X	X		X	X	X
Card dialer No card dialer	X	X	X	X	X	X	X	X	X
Grey control panel Ivory control panel	X	X	X	X	X	X	X	X	X
*Prefix part number listed with 690 to obtain complete Sangamo Part Number.									

Figure 1-B. T101CSC Data Set System Applications

- \* Easy installation with convenient access to strapping options
- \* Transmit level selected by loosening or tightening option screws; no meter or other equipment required
- \* No operator adjustments since operating conditions are selected with strapping options during installation
- \* Unaffected by ambient room noise since data set is electrically connected to data line
- \* Automatically answers calls, transmits answer-back tone, starts teletypewriter motor, and transmits answering station identification characters
- \* Initiates and responds to break and restrain signals
- \* Switch selectable operation for CBS or CBT DAA

- \* Switch selectable inversion of mark and space frequencies within each band for special applications.

#### 1-4 PHYSICAL DESCRIPTION

The data set is approximately 18 inches high, 9-3/4 inches wide, 4-3/4 inches deep, and weighs approximately 14 pounds. It is supplied with a power cord, call control panel, dial assembly, telephone handset, and all required mounting cords. A mounting kit is also provided with each data set.

#### 1-5 AUXILIARY EQUIPMENT

A listing of auxiliary equipment available for use with the data set is provided in figure 1-C. This equipment, when not purchased with the data set system, is available from Sangamo Electric Company.

#### 1-6 GENERAL SPECIFICATIONS

A listing of the general mechanical and electrical specifications for the T101CSC Data Set System is provided in figure 1-D.

Accessory	Part Number
Model 28 teletypewriter mounting kit	---
Model 33 teletypewriter mounting kit	696556-000
Model 35 teletypewriter mounting kit	696580-000
Model 38 teletypewriter mounting kit	---
Call control panel, rotary dial without card dialer (grey)	696742-001
Call control panel, rotary dial without card dialer (ivory)	696742-101
Call control panel, rotary dial with card dialer (grey)	696742-002
Call control panel, rotary dial with card dialer (ivory)	696742-102
Call control panel, tone dial without card dialer (grey)	696742-003
Call control panel, tone dial without card dialer (ivory)	696742-103
Call control panel, tone dial with card dialer (grey)	696742-004
Call control panel, tone dial with card dialer (ivory)	696742-104
Circuit drawer extender board	696939-000
Handset mounting cord	696744-001
DAA mounting cord	696745-001
TTY mounting cord (15 conductor-pairs)	696746-001
TTY mounting cord (19 conductor-pairs)	696746-002
Call control mounting cord	696741-001
TTD mounting cord	696963-001
Power cord	693676-000

Figure 1-C. Data Set System Accessories

Item	Specification																				
Input data format	Asynchronous, serial, binary.																				
Transmission speed	0 to 200 bits per second (100 words per minute).																				
Transmit signal level	Band $f_2$ : 0 to -14 dBm strappable in 2-db steps. Band $f_1$ : 0 to 6 dB below band $f_2$ level strappable in 2-db steps.																				
Receive signal level	0 to -45 dBm (not adjustable).																				
Carrier frequency	<table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 15%;"></th> <th style="width: 35%; text-align: center;">UPR</th> <th style="width: 35%; text-align: center;">INV</th> </tr> </thead> <tbody> <tr> <td>Band <math>f_1</math>:</td> <td>mark:</td> <td>1270 (<math>\pm 10</math>) Hz</td> <td>1070 (<math>\pm 10</math>) Hz</td> </tr> <tr> <td></td> <td>space:</td> <td>1070 (<math>\pm 10</math>) Hz</td> <td>1270 (<math>\pm 10</math>) Hz</td> </tr> <tr> <td>Band <math>f_2</math>:</td> <td>mark:</td> <td>2225 (<math>\pm 10</math>) Hz</td> <td>2025 (<math>\pm 10</math>) Hz</td> </tr> <tr> <td></td> <td>space:</td> <td>2025 (<math>\pm 10</math>) Hz</td> <td>2225 (<math>\pm 10</math>) Hz</td> </tr> </tbody> </table>			UPR	INV	Band $f_1$ :	mark:	1270 ( $\pm 10$ ) Hz	1070 ( $\pm 10$ ) Hz		space:	1070 ( $\pm 10$ ) Hz	1270 ( $\pm 10$ ) Hz	Band $f_2$ :	mark:	2225 ( $\pm 10$ ) Hz	2025 ( $\pm 10$ ) Hz		space:	2025 ( $\pm 10$ ) Hz	2225 ( $\pm 10$ ) Hz
		UPR	INV																		
Band $f_1$ :	mark:	1270 ( $\pm 10$ ) Hz	1070 ( $\pm 10$ ) Hz																		
	space:	1070 ( $\pm 10$ ) Hz	1270 ( $\pm 10$ ) Hz																		
Band $f_2$ :	mark:	2225 ( $\pm 10$ ) Hz	2025 ( $\pm 10$ ) Hz																		
	space:	2025 ( $\pm 10$ ) Hz	2225 ( $\pm 10$ ) Hz																		
Line requirements	Switched DDD network via CBS or CBT DAA.																				
Line impedance	600 ohms, balanced.																				
Operating temperature	0 to 50 degrees C.																				
Modulation	Dual channel frequency shift keying.																				
Alternate voice/data	Provided by telephone handset in conjunction with call control panel.																				
Automatic answer	Provided by data set in conjunction with UCC-6 call control unit and DAA.																				
Disconnect	Responds to loss of carrier, steady long space (clear), and EOT character.																				
Abort timer	Provides disconnect if carrier is not received from other station within 9 ( $\pm 3$ ) seconds.																				
Echo suppressor disable	Transmission of $f_m$ at station operating in $f_2$ band disables echo suppressors.																				
Local copy	Selectable from call control panel FULL/HALF switch.																				
Connections	Power: 3-wire grounding type plug. Tone dial (TTD) interface: 9-socket Molex connector. DAA interface: 15-socket Cinch or Cannon DA-155-C33 connector. EIA digital interface: 25-socket Cinch or Cannon DA-25S-C33 connector.																				

Figure 1-D. T101CSC Data Set System General Specifications Table

Item	Specification
Digital interface	TTY digital interface: 36-pin Molex connector. Call control unit interface: 36-socket Molex connector. Handset interface: 8-socket Molex connector.  TTY connector: 20 milliamperes on receive-data lead and contact closure on transmit-data lead. EIA interface: voltage interface conforming to EIA Standard RS-232-C and MIL-STD 188C (except carrier detect signal is on pin 12 and restrain relay contacts are on pins 8, 9, and 10).
Power requirement	120 VAC, $\pm 10$ percent, 47 to 63 Hz.

Figure 1-D (cont.). T101CSC Data Set System General Specifications Table



## 2-0 INSTALLATION AND CONNECTION

### 2-1 INTRODUCTION

This section provides the instructions for unpacking, installing and connecting the T101CSC Data Set System. Instructions for modifying the teletypewriter are also included.

### 2-2 UNPACKING

The data set is shipped in a strong corrugated carton. All mounting hardware required for installation is shipped in a separate carton. Upon receipt, check for damage to the shipping cartons. Then carefully unpack the data set system and inspect for possible damage. Give special attention to areas where the shipping cartons were damaged. If the data set system is damaged in any way, immediately notify the carrier and Sangamo Electric Company.

Also verify that all parts and accessories itemized in figure 2-A are included.

### 2-3 RETURNING DATA SET SYSTEM TO FACTORY

If it becomes necessary to return the data set system to Sangamo for repair or any other reason, the entire instrument; including all plug-in drawers, options, and accessories; must be returned. However do not return the data set system or any plug-in drawers or parts unless specifically directed to do so by Sangamo Electric Company Data Service Center. At that time a Returned Merchandise Report (RTS) number will be assigned to your instrument. This number must appear on the outside shipping container for proper identification and routing. It must also be referenced in any inquiries or correspondence about the instrument.

### 2-4 TELETYPEWRITER DISASSEMBLY

The following paragraphs provide the procedures required to disassemble a model 28, 33, and 35 teletypewriter in preparation for

modification and data set system installation. The model 38 teletypewriter does not require disassembly to install the data system.

#### 2-4-1 MODEL 28 DISASSEMBLY

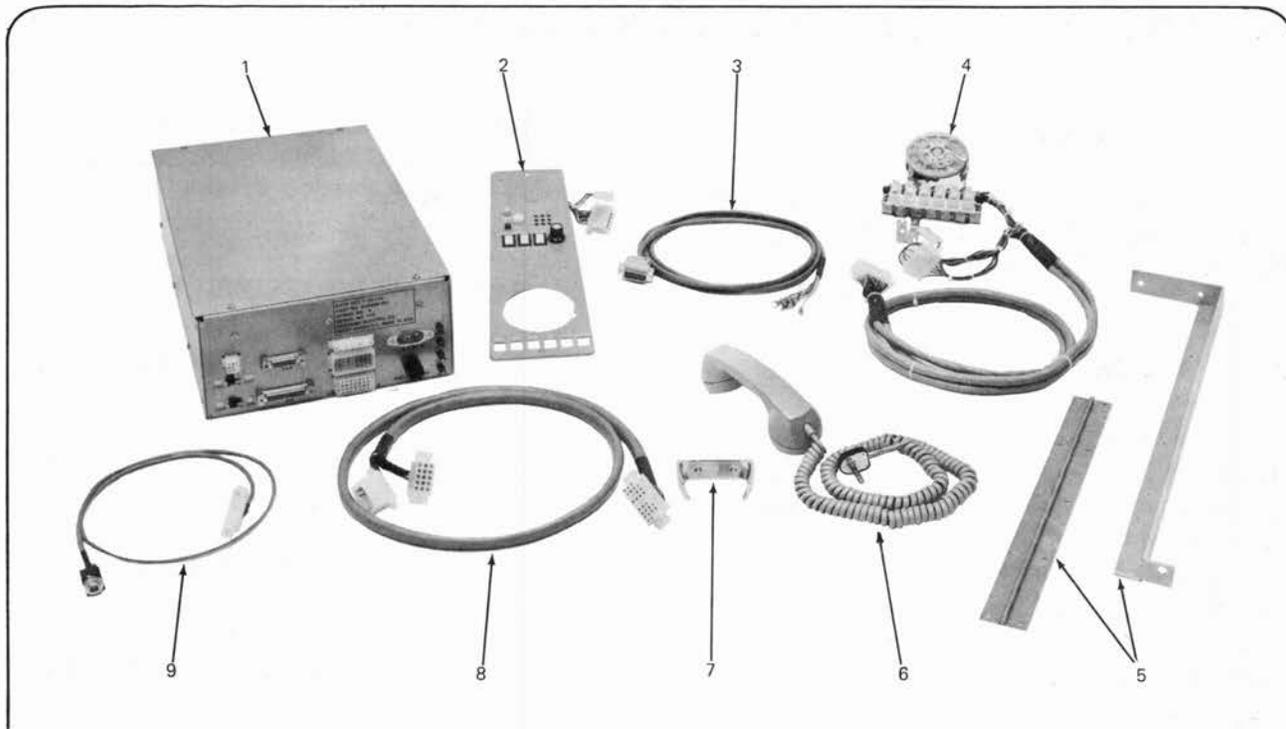
Disassemble the model 28 teletypewriter as follows:

- A. Remove kneewell cover from pedestal.
- B. Lift and swing back console cover.
- C. Remove blank control panel cover plate.

#### 2-4-2 MODEL 33 DISASSEMBLY

Disassemble the model 33 teletypewriter as follows:

- A. Remove teletypewriter from pedestal, if installed, by removing four large screws in base of teletypewriter. Screws are located inside pedestal.
- B. Remove call control panel by removing screw at top and bottom of panel.
- C. Remove cover from teletypewriter by removing nameplate strip and screws in front of teletypewriter base and screws in rear of teletypewriter base. Also remove one screw in side of tape reader cover.



Item	Description	Part Number
1	T101CSC Data Set	690396-001
2	Control panel for rotary dial without card dialer (grey) Control panel for rotary dial without card dialer (ivory) Control panel for rotary dial with card dialer (grey) Control panel for rotary dial with card dialer (ivory) Control panel for tone dial without card dialer (grey) Control panel for tone dial without card dialer (ivory) Control panel for tone dial with card dialer (grey) Control panel for tone dial with card dialer (ivory)	696742-001 696742-101 696742-002 696742-102 696742-003 696742-103 696742-004 696742-104
3	Data access arrangement mounting cord	696745-001
4	Rotary dial, switch, and control cable assembly Rotary dial, card dialer, switch, and control cable assembly Tone dial, switch, and control cable assembly Tone dial, card dialer, switch, and control cable assembly	696741-001 696741-002 696958-001 696958-002
5	Mounting kit for model 28 teletypewriter Mounting kit for model 33 teletypewriter Mounting kit for model 35 teletypewriter Mounting kit for model 38 teletypewriter	--- 696556-000 696580-000 ---

Figure 2-A. T101CSC Data Set System Subassemblies

Item	Description	Part Number
6	Handset and plug assembly	696743-002
7	Handset holder	693208-000
8	Teletypewriter mounting cord	696746-002
9	Handset cable	696744-001

Figure 2-A (cont.). T101CSC Data Set System Subassemblies

**2-4-3 MODEL 35 DISASSEMBLY**

Disassemble the model 35 teletypewriter as follows:

- A. Remove kneewell cover from pedestal.
- B. Lift and swing back console cover.
- C. Remove call control panel by removing screw at top and bottom of panel.
- D. Remove power control panel.

**2-5 TELETYPEWRITER MODIFICATION**

The following paragraphs provide the procedures required to modify a model 28, 33, and 35 teletypewriter for use with the T101CSC Data Set. New model 35 teletypewriters and all model 38 teletypewriters do not require modification before use.

**2-5-1 MODEL 28 MODIFICATION**

Modify the model 28 teletypewriter as follows:

- A. Secure parts listed in figure 2-B.
- B. Remove motor control from Electrical Service Unit (LESU 29) by disconnecting black lead from terminal E2 and red lead from E3. Separately tape and store leads.
- C. Install jumper strap between terminals D4 and D8.
- D. Install LESU 29 in console.
- E. Disconnect and separately tape and store the leads for the C wiring field as specified in figure 2-C.

Quantity	Part Description	Part Number
1	7-inch form feed out (FFO) and vertical tab (VT) mod kit	154768
1	Low paper/paper out mod kit	304776
1	Toggle switch SPST	328643
1	Toggle switch DPDT	20905FR
1	Pushbutton switch NO	949881
1	Pushbutton switch NC	949880
1	RS typebox	153508
1	TD ON nameplate	943200
1	TD OFF nameplate	943202
1	TAPE-ON/TAPE-OFF nameplate	943208
1	X-OFF BYPASS nameplate	943207
3	Space suppression set of parts	6211906
1	Dialer box	949913
1	Contact block assembly	6211242
1	Stunt box set of parts	6211905
1	Stunt box set of parts	6211242
1	Stunt box set of parts	6211907
1	Stunt box set of parts	6211244
2	Molex plug	182539
2	Molex receptacle	182540
1	Potter and Brumfield KRP11A relay	949909
1	Octal relay base	949910
1	Transmitter control mod kit	163535
1	Colon (:) type pallet (required only if missing from typebox)	157641
1	Bracket	153772
1	3.5K 10W resistor	---
1	RCA logo	943217

Figure 2-B. Model 28 Teletypewriter Modification Parts List

F. Disconnect the jumper straps from the terminals of the C wiring field as specified in figure 2-D.

G. Install jumper straps between the terminals of the C wiring field as specified in figure 2-E.

H. Install 3.5K, 10-watt resistor between C wiring field terminals C125 and C127.

I. Cut, tape, and store green wire on F connector pin 2 on keyboard base.

J. Disconnect blue wire from lock bar switch pin 2 on keyboard base.

K. Pull blue wire, removed in step J, through cable and connect to AH1-R.

L. Mount switches on console cover blank plate as shown in figure 2-F.

M. Install TD ON, TD OFF, TAPE ON/OFF, and X OFF/BYPASS labels by switches as shown in figure 2-F.

N. Connect switch terminals to C wiring field terminals as shown in figure 2-G.

O. Remove stunt box from printer.

Wire Color	Terminal
Brown	C19
Yellow	C16
Orange	C12
Blue	C127
Gray	C7
Gray	C130

Figure 2-C. Model 28 C Wiring Field Lead Disconnections

From Terminal	To Terminal
C8	C9
C20	C21 (may not be present)
C27	C28
C137	C138 and C139
C140	C141
C135	C136

Figure 2-D. Model 28 C Wiring Field Strap Disconnections

From Terminal	To Terminal
C135	C23
C24	C136
C9	C130
C138	C141
C125	C22

Figure 2-E. Model 28 C Wiring Field Strap Connections

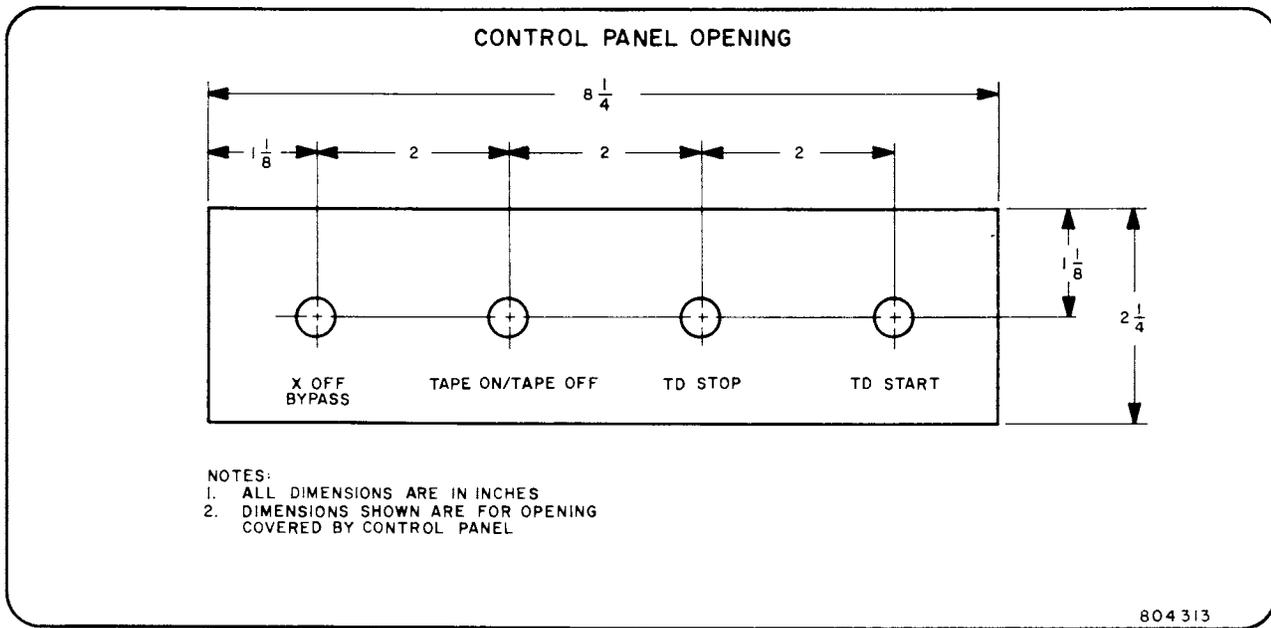


Figure 2-F. Model 28 Teletypewriter Control Panel Drilling Template

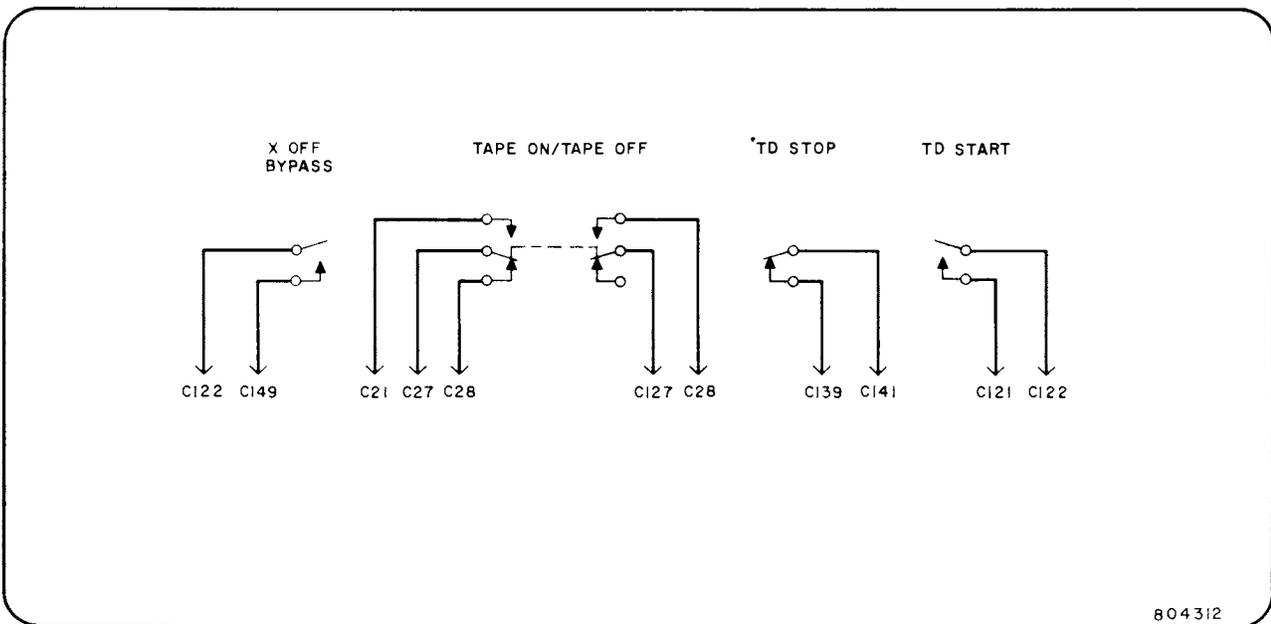


Figure 2-G. Model 28 Teletypewriter Control Panel Switch Connections

P. Deactivate parts set in slots 35 and 36 of stunt box.

Q. Install parts set 211907 in slot 23 and code for FIGURES.

R. Install parts set 211905 in slot 24 and code for upper case H.

S. Install contact block 211242 above slots 22 and 24.

T. Connect contact block to stunt box plug as shown in figure 2-H.

U. Recode in slot 22 for upper case F.

V. Recode universal function bar in slot 41 for upper case H.

W. Reinstall stunt box in printer.

X. Deactivate unshift-on-space feature.

Y. Remove upper case F, G, H, and Z type pallets from typebox.

Z. Check typebox for colon (:) in upper case C position. Install colon (:) type pallet if not already installed.

AA. Install relay base and Potter and Brumfield KRP11A relay in console. Locate in left corner behind transmitter distributor (LXD).

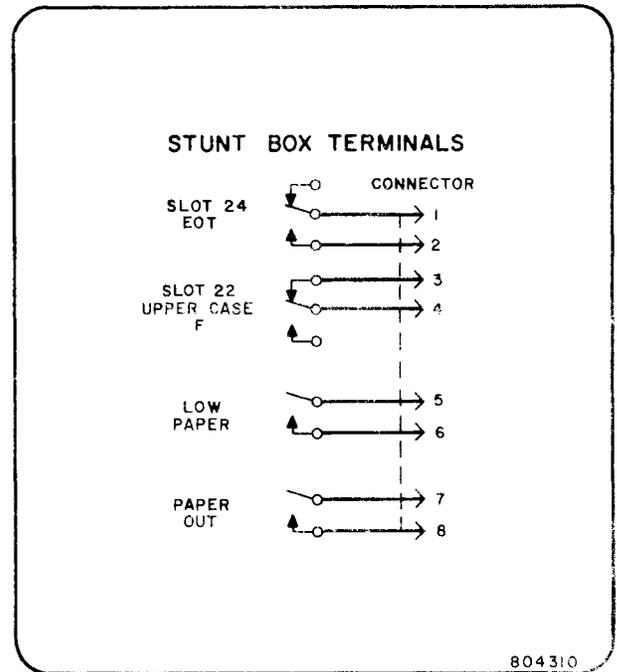


Figure 2-H. Model 28 Teletypewriter Stunt Box Contact Connections

AB. Connect relay base to C wiring field as specified in figure 2-I.

AC. Install low-paper/paper-out mod kit 304776 in printer.

AD. Connect low paper/paper-out terminals to stunt box plug as shown in figure 2-H.

Relay Base Pin	Connect To Terminal
1	C122
2	C121
3	Strap to relay pin 2
4	Not used
5	Not used
6	C137
7	C140
8	C138

Figure 2-I. Model 28 C Wiring Field/Relay Connections

AE. Prepare stunt box cord with connector on one end mating to plug on printer.

External Control connector). Use same wire colors specified in step AH.

AF. Connect leads on other end of cord to C wiring field as specified in figure 2-J.

AG. Check printer for vertical tab control contacts. Install vertical tab mod kit 163535 if contacts are not already installed. Connect in series with horizontal tab contacts on R12 and R13.

AH. Prepare 4-foot long, 15-conductor cable using female Molex receptacle with male pins (designated P2 connector). Use wire colors as specified in figure 2-K.

AI. Connect leads on other end of cable prepared in step AH to C wiring field as specified in figure 2-L.

AJ. Prepare 4-foot long, 15-conductor cable using male Molex plug with female pins (designated

Wire Color	Connect To Pin
Black	1
White	2
Red	3
Green	4
Orange	5
Blue	6
White/Black	7
Red/Black	8
Green/Black	9
Orange/Black	10
Blue/Black	11
Black/White	12
Red/White	13
Green/White	14
Blue/White	15

Figure 2-K. Model 28 P2 Pin Connections

Stunt Box Plug Pin	Connect to Terminal
1	C3
2	C16
3	C122
4	C149
5	C19
6	C12
7	C3
8	C16
9 thru 15	Spare

Figure 2-J. Model 28 C Wiring Field/Stunt Box Connections

Wire Color	Connect To Terminal
Black	C35
White	C37
Red	Spare
Green	Spare
Orange	C5
Blue	C15
White/Black	C8
Red/Black	C7
Green/Black	Spare
Orange/Black	Spare
Blue/Black	Spare
Black/White	Spare
Red/White	Spare
Green/White	C19
Blue/White	C12

Figure 2-L. Model 28 C Wiring Field/P2 Cable Connections

AK. Connect leads on other end of cable prepared in step AH to C wiring field as specified in figure 2-M.

AL. Deactivate Send/Receive Key. Leave in Receive position.

2-5-2 MODEL 33 MODIFICATION

Modify the model 33 teletypewriter as follows:

A. Secure parts listed in figure 2-N.

B. Convert teletypewriter to full duplex, 20-milliampere operation.

C. Install answerback-trip mod kit 341348.

D. Connect 1-foot length of 22-gauge, stranded wire to normally open contact on EOT contact block.

E. Install male Molex pin on opposite end of wire and insert into new External Molex connector position 13.

Wire Color	Connect To Terminal
Black	C122
White	C149
Red	Spare
Green	Spare
Orange	Spare
Blue	Spare
White/Black	Spare
Red/Black	Spare
Green/Black	Spare
Orange/Black	Spare
Blue/Black	C135
Black/White	C136
Red/White	C3
Green/White	C16
Blue/White	Spare

Figure 2-M. Model 28 C Wiring Field/External Cable Connections

F. Connect 1-foot length of 22-gauge, stranded wire to swinger contact on EOT contact block.

G. Install male Molex pin on opposite end of wire and insert into External Molex connector position 14.

Quantity	Part Description	Part Number
1	Answerback trip mod kit	341348
1	Molex receptacle (15-pin)	182539
11	Male Molex pins	6182643
3	Female Molex pins	6182644
4 feet	22-gauge stranded wire	---
2 inches	18-gauge stranded wire	---

Figure 2-N. Model 33 Teletypewriter Modification Parts List

- H. Connect two wires from magnet and answerback-trip mechanism to External Molex connector positions 5 and 8. wire. Insert male pin into External Molex connector position 12 and female pin into printer harness plug 6, position 14.
- I. Connect male Molex pin to each end of 2-inch length of 22-gauge, stranded wire and insert pins into External Molex connector positions 6 and 7. P. Remove white wire from printer harness plug 8, position 10 and remove male pin. Insert white wire and one end of 6-inch length of 22-gauge, stranded wire into another male Molex pin. Insert pin into printer harness plug 8, position 10.
- J. Remove yellow wire from call control unit Molex plug 1, position 12 and insert into plug 2, position 15.
- K. Remove red wire from call control unit Molex plug 1, position 12 and insert into plug 2, position 15. Q. Connect male Molex pin to other end of wire installed in step P and insert into External Molex connector position 15.
- L. Remove brown wire from call control unit Molex plug 4, position 1, replace male pin with female pin and insert wire into plug 2, position 2. R. Reconnect all printer harness plugs to call control unit plugs.
- M. Connect male Molex pin to one end and female Molex pin to other end of 2-inch length of 18-gauge, stranded wire. Insert male pin into call control unit plug 4, position 1 and female pin into plug 2, position 1. 2-5-3 MODEL 35 MODIFICATION  
Modify the model 35 teletypewriter as follows:
- N. Remove blue wire from printer harness plug 6, position 14, replace female pin with male pin, and insert male pin into External Molex connector position 11. A. Secure parts listed in figure 2-O.
- O. Connect male Molex pin to one end and female Molex pin to other end of 6-inch length of 22-gauge, stranded B. Remove POWER switch from Power Control panel, set to ON LINE position, and fasten inside cabinet next to right side of printer.
- C. Remove wires by disconnecting both ends as specified in figure 2-P.

Quantity	Part Description	Part Number
6	Set of parts (stunt box)	6211905
5	Contact	6212244
#1	Diode 1N4004	949885
#1	25 $\mu$ F 450VDC capacitor	949884
4	Male connector pin	173715
*2	Potter and Brumfield KRP11A relay	949909
*2	Octal relay base	949910
2	Set of parts	6212242
1	Female Molex connector (15-pin)	6181721
1	Male Molex connector (15-pin)	6181748
8	Female Molex connector pin	6182644
8	Male Molex connector pin	6182643
1	Pushbutton switch NC	949880
1	Pushbutton switch NO	949881
1	2-foot, 15-conductor cable	---
2	1.5-foot, 15-conductor cable	---
1	M35 adapter cable assembly	949914
1	Paper out alarm FF (optional)	6194324

# Not used if UTEC answerback is used  
\* Only 1 required if UTEC answerback is used

Figure 2-O. Model 35 Teletypewriter Modification Parts List

From Terminal	Connected To	Wire Color
C6K	Transmitter Dist. U6	White/black/orange
C2D	Keyboard F36	White/blue
C3D	Keyboard F37	White/yellow
C4D	Keyboard F30	Green
C5D	Keyboard F24	White/red
C6D	Keyboard F25	Red/green
C6J	Mode Switch Conn. V3	White/orange/blue
C2C	Aux Power Supply LH	Yellow
C1M	C Wiring Field C2N	Strap
C5E	Keyboard F18	Slate
C6G	Mode Switch Conn. V1	Brown/green
C6H	Mode Switch Conn. V2	Black/slate
C4C	Aux Power Supply LK	Black/blue
C6C	Line Local Relay H7	Orange/slate
C5L	C Wiring Field C5M	Strap

Figure 2-P. Model 35 C Wiring Field Lead Disconnections

- D. Move the following leads on the C Wiring Field to new terminals on the C Wiring Field as specified in figure 2-Q.
- E. Install jumper straps on the C Wiring Field terminals as specified in figure 2-R.
- F. Install jumper strap on MODE switch, section 1 between terminals 1 and 2.
- G. Install HERE IS pushbutton in Power Control panel hole previously occupied by POWER switch.
- H. Mount Potter and Brumfield relay KRP11A in console by transmitter distributor (LXD).
- I. Connect relay terminals to C Wiring Field Terminals as specified in figure 2-S.
- J. Prepare 1.5-foot, 15-conductor cable using female Molex receptacle with male pins (designated P2 connector). Use wire colors as specified in paragraph 2-5-1, step AH.
- K. Connect leads on other end of cable prepared in step J to teletypewriter terminals as specified in figure 2-T.
- L. Prepare 1.5-foot, 15-conductor cable using male Molex plug with female pins (designated External Control connector). Use wire colors as specified in paragraph 2-5-1, step AH.

From Terminal	To Terminal	Wire Color
C5C	C2D	Blue/slate
*C4K	C3F	Red/orange
C3A	C2C	White/purple
C2E	C2F	Black
C2E	C2F	Red/yellow
C2K	C6H	Brown/green
C3K	C5E	Orange/slate
C3K	C2K	Black/orange
C3F	C5E	Yellow/green
C4F	C3D	Red/blue

\*Move lead only if X-ON/X-OFF or TAPE-ON/TAPE-OFF modifications are installed.

Figure 2-Q. Model 35 C Wiring Field Jumper Lead Disconnections

From Terminal	To Terminal
*C6E	C6G
*C6G	C6K
C6K	C6L
C6L	C5M

\*Do not install strap if UTEC answer-back is used.

Figure 2-R. Model 35 C Wiring Field Strap Connections

From Relay Terminal	To Terminal
TDR1	C6H
TDR2	C5D
TDR3	Strap to TDR2
TDR4	Not used
TDR5	Not used
TDR6	C4K
*TDR7	C6G
TDR8	C3F

\*Install strap on C6K instead of C6G if UTEC answerback is used.

Figure 2-S. Model 35 C Wiring Field/TDR Relay Connections

- M. Connect leads on other end of cable prepared in step L to teletypewriter terminals as specified in figure 2-U.
- N. Connect Transmitter Control Panel terminals to C Wiring Field terminals as specified in figure 2-V if X-ON/X-OFF or TAPE-On/TAPE-OFF modifications are installed.
- O. If LABD-800 answerback is used, mount Potter and Brumfield relay KRP-11A

Wire Color	Terminal Location	Connect To Terminal
Black	C Wiring Field	C1M
White	C Wiring Field	C2N
Red	Spare	
Green	Spare	
Orange	Power Terminal Block	T5
Blue	Power Terminal Block	T6
White/Black	Power Terminal Block	T7
Red/Black	Power Terminal Block	T8
Green/Black	Spare	
Orange/Black	Spare	
Blue/Black	Spare	
Black/White	Spare	
Red/White	Spare	
Green/White	Low Paper CTX	
Blue/White	Low Paper CTX	

Figure 2-T. Model 35 P2 Cable Connections

Wire Color	Terminal Location	Connect To Terminal
Black	Spare	
White	Spare	
Red	Spare	
Green	Spare	
Blue	Spare	
White/Black	Spare	
Red/Black	C Wiring Field	C1F
*Green/Black	C Wiring Field	C6E
Orange/Black	Spare	
Blue/Black	Spare	
Black/White	Restraint Contact	
Red/White	Restraint Contact	
Green/White	C Wiring Field	C6M
Blue/White	C Wiring Field	C3F

\*Connect lead to C6G instead of C6E if UTEC answerback is used.

Figure 2-U. Model 35 External Cable Connections

in console by transmitter distributor (LXD).

- P. Connect relay terminals to C Wiring Field as specified in figure 2-W.
- Q. Connect cathode of 1N4004 diode to NCR relay terminal 7 and anode to C Wiring Field terminal C2E.
- R. If LABD-800 answerback is used, connect terminals to C Wiring Field as specified in figure 2-X.
- S. Connect HERE IS pushbutton terminals to C Wiring Field as specified in figure 2-Y.

T. Connect Stunt Box Printer Connector pins to C Wiring Field terminals as specified in figure 2-Z.

U. If UTEC answerback is used, connect to C Wiring Field terminals as specified in figure 2-AA.

From LABD-800 Terminal	Connect To Terminal
9	C1D
10	C5J
11	C2D
12	C5C

Figure 2-X. Model 35 C Wiring Field/LABD 800 Connections

Transmitter Control Panel Terminal	Connect To Terminal
1	C6H
2	C3B
3	C5D
4	C6H
5	C3D
6	C5J
7	C3D
8	C5E

Figure 2-V. Model 35 C Wiring Field/Transmitter Control Panel Connections

From HERE IS Terminal	Connect To Terminal
*Swinger N/O	C6K C1F
*Connect lead to C6G instead of C6K of UTEC answerback is used.	

Figure 2-Y. Model 35 C Wiring Field/HERE IS Connections

From NCR Relay Terminal	Connect To Terminal
1	C1D
2	C2N
3	Not used
4	C1F
5	Not used
6	Not used
7	See Step Q
8	Not used

Figure 2-W. Model 35 C Wiring Field/NCR Relay Connections

From Printer Connector Pin	Connect To Terminal
R29	C5E
R40	C5D
R41	C6J
R42	C2C
R43	C3B
R25	C1F
R26	C6G
R39	C3D
R8	C6M
C9	C5L

Figure 2-Z. Model 35 C Wiring Field/Printer Connections

- V. Install parts set 211905 in Stunt Box slots and code as specified in figure 2-AB.
- W. Connect Stunt Box contacts to Printer R connector pins as shown in figure 2-AC.
- X. Reconnect all printer harness plugs to call control unit plugs.

Read the description of each option before installing options in the data set.

### 2-7 DATA SET OPTION INSTALLATION

The options for the data set are installed by tightening or loosening option screws on Drawer Assembly Number 1 (see figure 2-AE) and by setting two slide switches on the data set connector panel. Figure 2-AF illustrates the location of the option screws. Refer to figure 2-AG for a listing of the options used with the data set. Select and install the options as follows:

### 2-6 DATA SET OPTION DESCRIPTION

The data set options are selected by the positioning of option screws located on drawer assembly number 1 and by setting two slide switches on the data set connector panel. These options allow the installer to select the data set operation to meet the requirements of the particular installation application. Each data set option is listed and described in figure 2-AD.

- A. Loosen screw on each card lock for circuit assembly number 1 and slide card locks back to allow circuit assembly to be removed. Remove circuit assembly number 1.

From UTEC Terminal	Connect To Terminal
Inhibit 1	C2E
Inhibit 2	C6E
Start 1	C1F
Start 2	C6G
Signal 1	C2D
Signal 2	C5C

Figure 2-AA. Model 35 C Wiring Field/UTEC Connections

Stunt Box Slot	Code	Function
14	CTRL E	WRU
15	CTRL D	EOT
16	CTRL G	BELL
18	CTRL D	EOT
19	CTRL Q	X-ON
20	CTRL S	X-OFF
21	CTRL T	TAPE-OFF

Figure 2-AB. Model 35 Stunt Box Coding

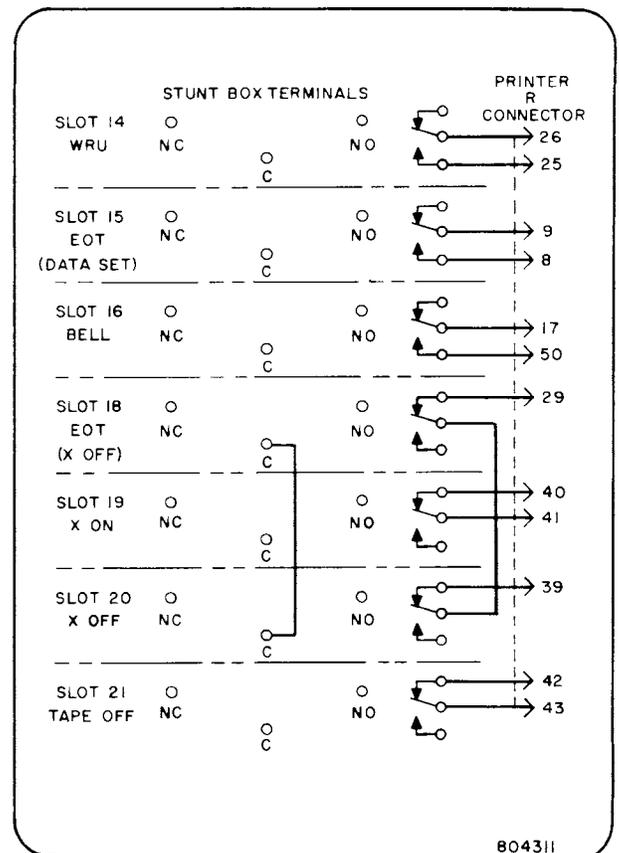


Figure 2-AC. Model 35 Teletypewriter Stunt Box Contact Connections

804311

Option	Description
f <sub>2</sub> transmit level (dBm)	Six option screws allow installer to adjust transmitted power level 0 to -14 dBm in 2-dB steps. Level to be strapped is marked on DAA cover or provided by operating telephone company installing DAA. If exact level cannot be installed, select next lowest value. Never strap data set transmit level above value indicated on DAA.
f <sub>1</sub> transmit level below f <sub>2</sub> transmit level (dB)	Normally, f <sub>1</sub> transmit level is strapped equal to (0 dB below) f <sub>2</sub> transmit level. High frequency line losses for some applications require that f <sub>2</sub> band be transmitted at a higher level than f <sub>1</sub> band. This form of amplitude pre-equalization is accomplished by setting f <sub>1</sub> band below f <sub>2</sub> band at transmitting station. Option required is determined by particular application.
CBS/CBT DAA	Slide switch on data set connector panel is used to condition DAA interface for operation with either CBT (1001B) or CBS (1001A) DAA. Set switch to position that applies to type of DAA used.
INV/UPR mode	Slide switch on data set connector panel is used to invert the mark and space frequencies within each band for special applications. Normally, switch is used in UPR (upright) position.

Figure 2-AD. Data Set Option Description

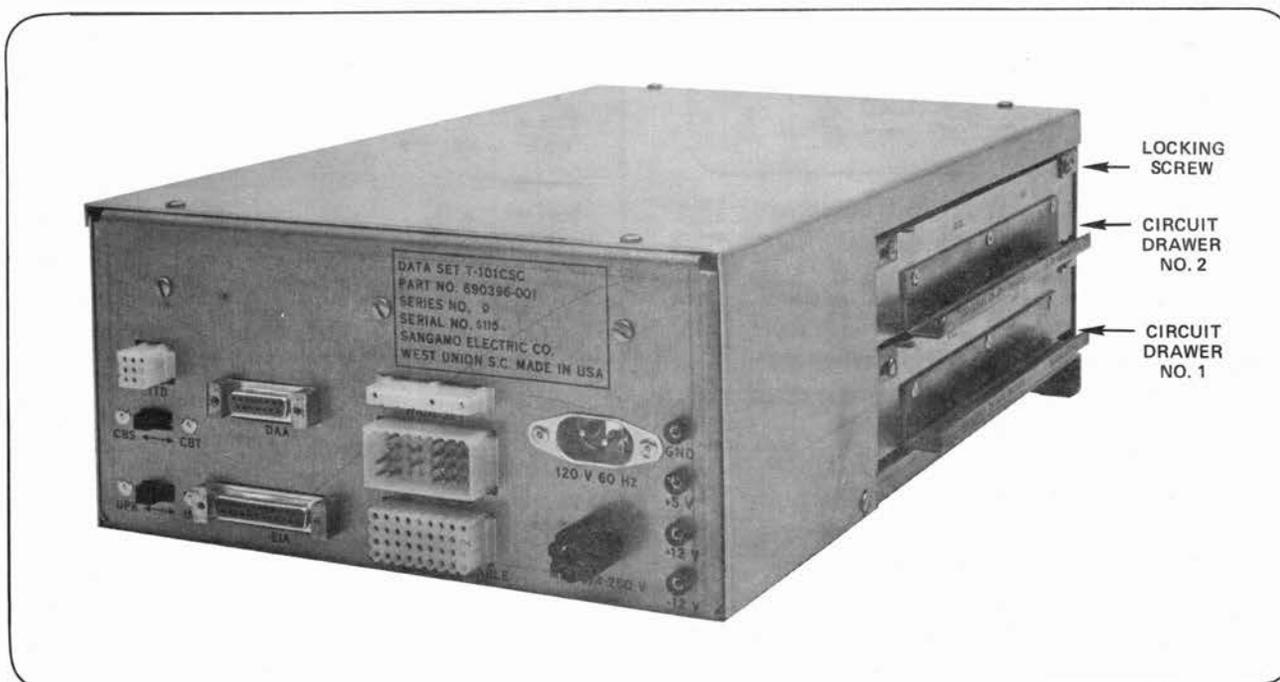


Figure 2-AE. Data Set Circuit Drawer and Drawer Locking Screw Locations

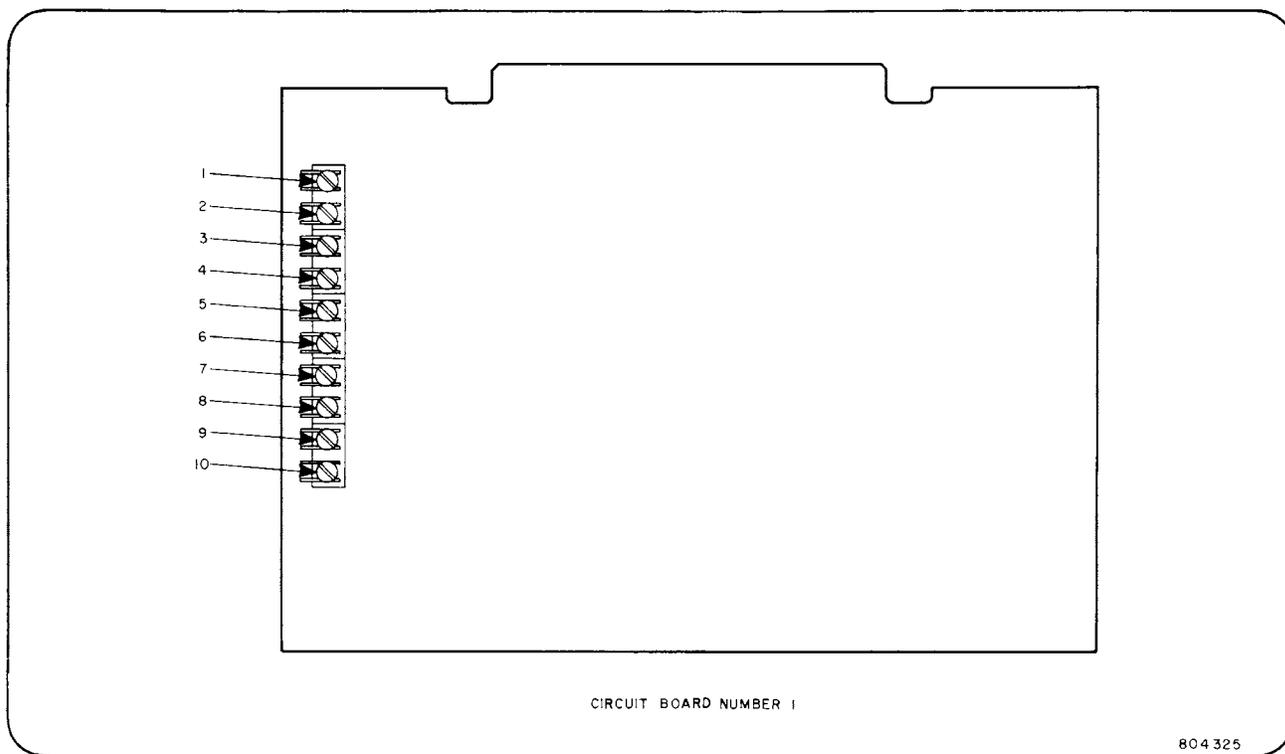


Figure 2-AF. Circuit Drawer Option Screw Locations

Feature	Options	Option Screws	
		Up	Down
f <sub>2</sub> transmit level (dBm)	0	5,7,9	6,8,10
	-2	5,7,10	6,8,9
	-4	5,8,9	6,7,10
	-6	5,8,10	6,7,9
	*-8	6,7,9	5,8,10
	-10	6,7,10	5,8,9
	-12	6,8,9	5,7,10
	-14	6,8,10	5,7,9
f <sub>1</sub> transmit level below f <sub>2</sub> transmit level (dB)	*0	1,3	2,4
	2	1,4	2,3
	4	2,3	1,4
	6	2,4	1,3
DAA	CBS	Set switch to CBS position	
	CBT	Set switch to CBT position	
Frequencies	Upright (normal)	Set switch to UPR position	
	Inverted	Set switch to INV position	

\* Factory installed option

Figure 2-AG. Data Set Strapping Option Table

- B. Select option to be installed. Then loosen, but do not remove, screws listed as being in up position and securely tighten screws listed as being in down position.
- C. Reinsert circuit assembly number 1 in data set, ensuring circuit assembly seats firmly in connector.
- D. Reposition card locks to secure circuit assembly and tighten screws.
- E. Set CBT/CBS and UPR/INV slide switches on data set connector panel as described in figure 2-AG.

**2-8 DATA SET SYSTEM MODIFICATION FOR SPECIAL APPLICATIONS**

When using the data set system in special applications, it might be necessary to modify the interconnection cables for proper business machine interface. A description of the data set EIA connector signals is provided in figure 2-AH and a description of all other data set connector signals is provided in figure 2-AI. Wiring diagrams of the data set system interconnection cables are provided in figure 4-A and a simplified functional block diagram of the data set is provided in figure 4-B. These figures provide the necessary information to allow the installer to modify the system for special interconnections.

**2-9 DATA SET SYSTEM INSTALLATION FOR MODEL 28 TELETYPEWRITER**

The following paragraphs provide the procedures required to install the telephone handset, data set mounting bracket, dial assembly, and data set in the Model 28 teletypewriter. Control panel installation is provided in paragraph 2-15.

**2-9-1 TELEPHONE HANDSET INSTALLATION**

Install the telephone handset phone jack and handset holder as follows:

(To Be Supplied)

**2-9-2 MOUNTING BRACKET INSTALLATION**

Install the data set mounting bracket as follows:

(To Be Supplied)

**2-9-3 DIAL ASSEMBLY INSTALLATION**

Install the dial assembly over the call control unit as follows:

(To Be Supplied)

**2-9-4 DATA SET INSTALLATION**

Install the data set in the teletypewriter as follows:

(To Be Supplied)

**2-10 DATA SET SYSTEM INSTALLATION FOR MODEL 33 TELETYPEWRITER**

The following paragraphs provided the procedures required to install the telephone handset, data set mounting bracket, dial assembly, and data set in the Model 33 teletypewriter. Control panel installation is provided in paragraph 2-15.

**2-10-1 TELEPHONE HANDSET INSTALLATION**

Install the telephone handset phone jack and handset holder as follows:

- A. Drill one hole in upper left (looking at rear of teletypewriter pedestal)

J3 Pin No.	Function	EIA Desig.	CCITT Desig.	Description
1	Protective ground	AA	101	Frame ground connected to green, third wire of power cord. Frame ground also connected to signal ground (AB) inside data set.
2	Transmitted data	BA	103	Transmitted data from business machine applied to this pin. Negative voltage represents mark condition and positive voltage represents space condition.
3	Received data	BB	104	Received data applied to business machine at this pin. Negative voltage represents mark condition and positive voltage represents space condition.
4	Not used			
5	Clear-to-send	CB	106	Data set applies positive voltage to this pin when connected to line and controlled interval space signal is not received. Clear-to-send signal is removed when short or long space signal is received and when data set disconnects from line.
6	Data set ready	CC	107	This pin connected directly to pin 20. Therefore, business machine data-terminal-ready signal is applied back to business machine from data set as data-set-ready signal.
7	Signal ground (common return)	AB	102	Data ground reference is at this pin. Connected to frame ground (AA) inside data set.
* 8	Restrain NC	---	---	Normally closed Restrain relay contact. Continuity provided with pin 9 when no restrain signal is received. Relay provides open circuit to this pin when restrain signal is received.
□ 9	Restrain common	---	---	Common Restrain relay contact. Signal applied to this pin from business machine is applied to pin 8 when no restrain signal is received and is applied to pin 10 when restrain signal is received.
☆ 10	Restrain NO	---	---	Normally open Restrain relay contact. Open circuit provided to this pin when no restrain signal is received. Continuity provided with pin 9 when restrain signal is received.
11	Not used			
* 12	Received line signal detector	CF	109	Data set applies positive voltage to this pin when carrier is being received. Negative voltage is applied when no carrier is received.
13 thru 19	Not used			
20	Data terminal ready	CD	108/2	Business machine applies positive voltage when ready to transmit or receive data. Connected directly to pin 6 (CC) to provide data-set-ready.
21 thru 25	Not used			
<p>* This is not an EIA function. Received line signal detector (CF) at pin 12 is normally at this pin.  □ This is not an EIA function. +Power (+V) is normally at this pin.  ☆ This is not an EIA function. -Power (-V) is normally at this pin.  ★ Received line signal detector (CF) is normally on pin 8 and supervisory received data (SB) is normally on this pin.</p>				

Figure 2-AH. Data Set EIA Connector Signal Description Table

Pin No. 1	Description
TTD Connector J1	
1	Tone dial oscillator output signal to data set amplifier.
2	Data set signal ground for tone dial oscillator.
3	Dialing tones from data set amplifier via normally closed connect relay contact.
4	Dialing tones from J1-3 via tone dial normally open CS contact. Signal applied to data set line circuit.
5	Spare
6	Spare
7	Spare
8	Spare
DAA Connector J2	
1	Off/on hook control (OH). Orange lead.
2	+12 volts DC (+V). Brown lead. CBT only.
3	Data transmission path cut-through request (DA). Blue lead.
4	Not used. Red lead. <i>CCT</i>
5	- 12 volts DC (-V) for CBT. Signal ground (SG) for CBS. Green lead.
6	Ring indicator (RI). White lead.
7	Data tip. Black lead.
8	Data Ring. Yellow lead.
9	Spare
10	Spare
11	Spare
12	Spare
13	Spare

Figure 2-A1. Data Set Connectors Signal Descriptions

Pin No. 1	Description
DAA Connector J2 (Continued)	
14	Spare
15	Spare
HANDSET Connector J4	
1	Data set line signal output to handset receiver via VOICE position of VOICE/DATA switch.
2	Spare
3	Spare
4	Spare
5	Data set signal ground for handset transmitter and receiver.
6	Spare
7	Spare
8	Handset transmitter output to data set voice circuit.
TTY CABLE Connector J5	
1	115 volts AC to teletypewriter motor start relay from J5-2 via data set normally open motor control relay contact.
2	115 volts AC to data set normally open motor control relay contact from teletypewriter. Refer to J5-1 description.
3	Spare
4	Spare
5	-20 volts DC output to teletypewriter for transmit data contact input to J5-6.
6	Transmit data input from teletypewriter. -20 volts DC input represents mark condition. Open circuit represents space condition. Refer to J5-5 description.
7	+100 volts DC output to teletypewriter for receive data selector magnet driver. Refer to J5-8 description.

Figure 2-A1 (cont.). Data Set Connectors Signal Descriptions

Pin No. 1	Description
TTY CABLE Connector J5 (Continued)	
8	Receive data output to teletypewriter selector magnet driver. 20-milliampere current path represents mark condition. Open circuit represents space condition. Refer to J5-7 description.
9	Normally closed local relay contact. Refer to J5-10 and J5-11 descriptions.
10	Common local relay contact for normally closed contact at J5-9 and normally open contact at J5-11.
11	Normally open local relay contact. Refer to J5-9 and J5-10 descriptions.
12	Spare
13	Spare
14	+20 volts DC output to normally open low paper switch contact from BUZ RLS lamp. With low paper alarm condition, provides data set signal ground to light BUZ RLS lamp via normally open low paper switch contact. Refer to J5-15, J6-9, J6-27, and J6-28 description.
15	+20 volts DC input from normally open low paper switch contact for data set alarm buzzer. Also provides +20 volts DC to silence buzzer. With buzzer silenced, provides data set signal ground to normally open low paper switch contact to light BUZ RLS lamp. Refer to J5-14, J6-9, J6-27, and J6-28 descriptions.
16	Spare
17	Spare
18	Spare
19	Spare
20	Spare
21	Normally open originate relay contact. Refer to J5-22 and J5-23 descriptions.
22	Common originate relay contact for normally open contact at J5-21 and normally closed contact at J5-23.
23	Normally closed originate relay contact. Refer to J5-21 and J5-22 descriptions.

Figure 2-A1 (cont.). Data Set Connectors Signal Descriptions

Pin No. 1	Description
<b>TTY CABLE Connector J5 (Continued)</b>	
24	Normally open answer relay contact. Refer to J5-25 and J5-26 descriptions.
25	Common answer relay contact for normally open contact at J5-24 and normally closed contact at J5-26.
26	Normally closed answer relay contact. Refer to J5-24 and J5-25 descriptions.
27	48 volts AC from teletypewriter power transformer to normally open answer relay and normally open answer pulse relay contacts (in series) for teletypewriter answerback trip magnet. Refer to J5-28 description.
28	48 volts AC from J5-27 via normally open answer relay contact and normally open answer pulse relay contact for teletypewriter answerback trip magnet.
29	+48 volts DC from teletypewriter to normally open receive space relay contact for teletypewriter form feed-out magnet. (Model 35 only.) Refer to J5-30 description.
30	+48 volts DC from J5-29 via normally open receive space relay contact to teletypewriter form feed-out magnet. (Model 35 only.)
31	115 volts AC to data set normally closed receive break relay and normally closed restrain relay contacts (in series) from teletypewriter. Refer to J5-32 description.
32	115 volts AC from J5-31 via normally closed receive break relay and normally closed restrain relay contacts (in series) to teletypewriter tape drive trip magnet.
33	Signal ground from teletypewriter normally open end-of-transmission (EOT) function contact to activate data set EOT disconnect circuit. Refer to J5-34 description.
34	Data set signal ground to teletypewriter normally open EOT function contact. Refer to J5-33 description.
35	-20 volts DC during receive break condition to blank teletypewriter keyboard. Open circuit to -20 volts DC across teletypewriter keyboard at all other times.
36	Spare

Figure 2-A1 (cont.). Data Set Connectors Signal Descriptions

Pin No.1	Description
CALL CONTROL CABLE Connector J6	
1	Data set +20 volts DC output to call control panel for lamp power and NORMAL/OUT OF SERVICE switch.
2	Signal ground from normally open ORIG pushbutton switch.
3	+20 volts DC from NORMAL position of NORMAL/OUT OF SERVICE switch for data set. Open circuit with switch in OUT OF SERVICE position.
4	Signal ground from normally open TEST pushbutton switch.
5	Signal ground from normally open LCL pushbutton switch.
6	Signal ground from normally open CLR pushbutton switch.
7	Signal ground from data set answer circuit lamp driver to light ANS lamp when in answer mode of operation.
8	Signal ground from normally open ANS pushbutton switch.
9	+20 volts DC output from J5-15 to normally open BUZ RLS pushbutton switch contact to silence buzzer. With buzzer silenced, signal ground is present at this pin. Refer to J5-14, J5-15, J6-27, and J6-28 descriptions.
10	Signal ground from data set for call control speaker. Refer to J6-16 description.
11	Data set +12 volts DC to normally closed rotary dial contact for generating dialing pulses. Refer to J6-12 description.
12	+12 volts DC from normally closed rotary dial contact. Switches between +12 volts DC and open circuit as rotary dial contact opens and closes to generate dialing pulses via OH signal output to DAA. Refer to J6-11 description.
13	Data set signal ground from normally open off normal rotary dial contact. Contact closes whenever dial moves from home position. Disables DA signal output to DAA. Refer to J6-29 description.
14	Data set signal ground from common contact of HALF/FULL switch when in HALF position. Open circuit when in FULL position. Refer to J6-15 description.

Figure 2-AI (cont.). Data Set Connectors Signal Descriptions

Pin No. 1	Description
CALL CONTROL CABLE Connector J6 (Continued)	
15	Data set signal ground to HALF position of HALF/FULL switch. Refer to J6-14 description.
16	Data set audio amplifier output to call control speaker. Refer to J6-10 description.
17	Signal ground or +5 volts DC from common contact of VOICE/DATA switch for data set voice circuit. Refer to J6-18 and J6-19 descriptions.
18	Data set +5 volts DC to VOICE position of VOICE/DATA switch to activate data set voice circuit. Refer to J6-17 and J6-19 descriptions.
19	Data set signal ground to DATA position of VOICE/DATA switch to disable data set voice circuit. Refer to J6-17 and J6-18 descriptions.
20	Amplified line signal output from data set hybrid transformer to common contact of VOICE/DATA switch. Refer to J6-21 and J6-22 descriptions.
21	Amplified line signal output from J6-20 via VOICE position of VOICE/DATA switch to telephone handset receiver. Refer to J6-20 and J-21 descriptions.
22	Amplified line signal output from J6-20 via DATA position of VOICE/DATA switch to line filters and receive circuit. Refer to J6-20 and J6-21 descriptions.
23	Received line signal to VOLUME control for speaker. Refer to J6-24 description.
24	VOLUME control output to data set audio amplifier for speaker. Refer to J6-23 description.
25	14 volts AC output for card dialer power.
26	Signal ground output for card dialer.
27	+20 volts DC input from BUZ RLS lamp to normally open low paper switch contact via J5-14. With low paper alarm condition, provides data set signal ground to light BUZ RLS lamp via normally open low paper switch contact and J5-14. Refer to J5-14, J5-15, J6-9, and J6-28 descriptions.
28	+20 volts DC from normally open BUZ RLS pushbutton switch to buzzer disable circuit to silence buzzer. Refer to J5-14, J5-15, J6-9, and J6-27 descriptions.

Figure 2-A1 (cont.). Data Set Connectors Signal Descriptions

Pin No. 1	Description
CALL CONTROL CABLE Connector J6 (Continued)	
29	Data set signal ground to normally open off normal rotary dial contact. Refer to J6-13 description.
30	Signal ground from normally open restrain relay contact to light REST lamp when restrain signal is received.
31	Signal ground from receive break circuit to light BRK RLS lamp when break signal is received.
32	Signal ground from normally closed BRK RLS pushbutton switch contact to latch receive break circuit. Pressing pushbutton opens circuit and unlatches receive break circuit. Refer to J6-33 description.
33	Data set signal ground to common BRK RLS pushbutton contact. Refer to J6-32 description.
34	Spare
35	Spare
36	Spare

Figure 2-AI (cont.). Data Set Connectors Signal Descriptions

corner of pedestal flange as shown in figure 2-AJ.

#### 2-10-2 M O U N T I N G B R A C K E T I N S T A L L A T I O N

- B. Drill two holes in upper left corner of right side of pedestal (looking at front of teletypewriter) as shown in figure 2-AK.

Install the data set mounting bracket as follows:

- C. Mount handset holder on right side of pedestal using two screws supplied with holder.

- A. Install mounting bracket in pedestal as shown in figure 2-AL(B) using two 10-32 x 5/16 screws, 10-32 nuts, and lockwashers at bottom and one 1/4-20 x 1/2 screw, 1/4-20 nut, and lockwasher at top of pedestal.

- D. Install phone jack (connected to one end of mounting cord 696744) through hole drilled in flange on rear of pedestal using nut and washer supplied with phone jack.

- B. Install support nut as shown in figure 2-AL(B) using one 8-32 x 5/16 screw. Install one 8-32 x 5/16 screw in top of support nut (do not tighten).

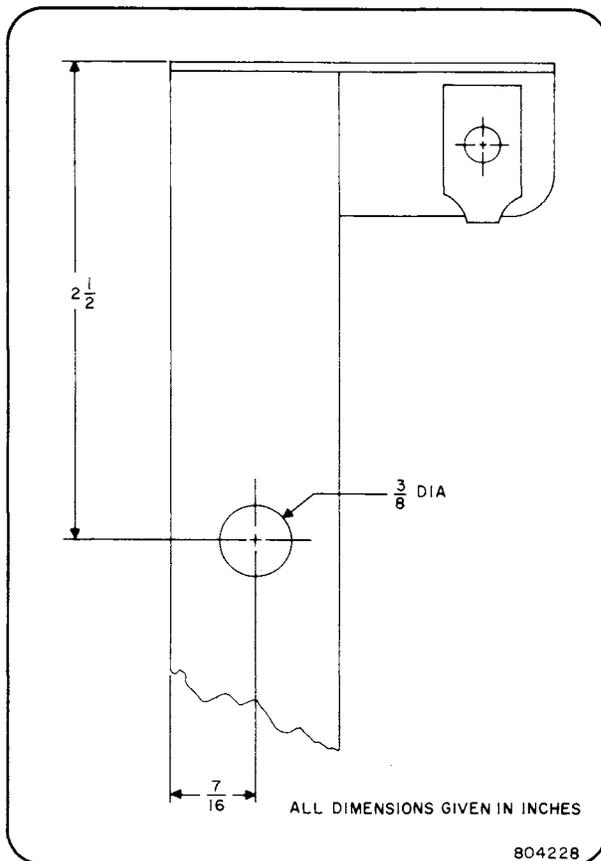


Figure 2-AJ. Model 33 Teletypewriter  
Phone Jack Drilling Dimensions

- C. Install hinge on mounting bracket as shown in figure 2-AL(C) using five 6-32 x 1/4 screws.

#### 2-10-3 DIAL ASSEMBLY INSTALLATION

Install the dial assembly over the call control unit as follows:

- A. Remove call control unit from teletypewriter.
- B. Install five hex-head screws in three dial assembly support pedestals at front of call control unit.
- C. Install dial assembly on three support pedestals at front of call control unit and tighten five screws.

- D. Reinstall call control unit in teletypewriter.
- E. Run dial assembly cable around right side of call control unit to rear of teletypewriter.

#### 2-10-4 DATA SET INSTALLATION

Install the data set in the teletypewriter as follows:

- A. Install data set in pedestal as shown in figure 2-AL(D) using five 6-32 x 1/4 screws.

#### 2-11 DATA SET SYSTEM INSTALLATION FOR MODEL 35 TELETYPEWRITER

The following paragraphs provide the procedures required to install the telephone handset, data set mounting bracket, dial assembly, and data set in the Model 35 teletypewriter. Control panel installation is provided in paragraph 2-15.

##### 2-11-1 TELEPHONE HANDSET INSTALLATION

Install the telephone handset phone jack and handset holder as follows:

(To Be Supplied)

##### 2-11-2 MOUNTING BRACKET INSTALLATION

Install the data set mounting bracket as follows:

(To Be Supplied)

##### 2-11-3 DIAL ASSEMBLY INSTALLATION

Install the dial assembly over the call control unit as follows:

(To Be Supplied)

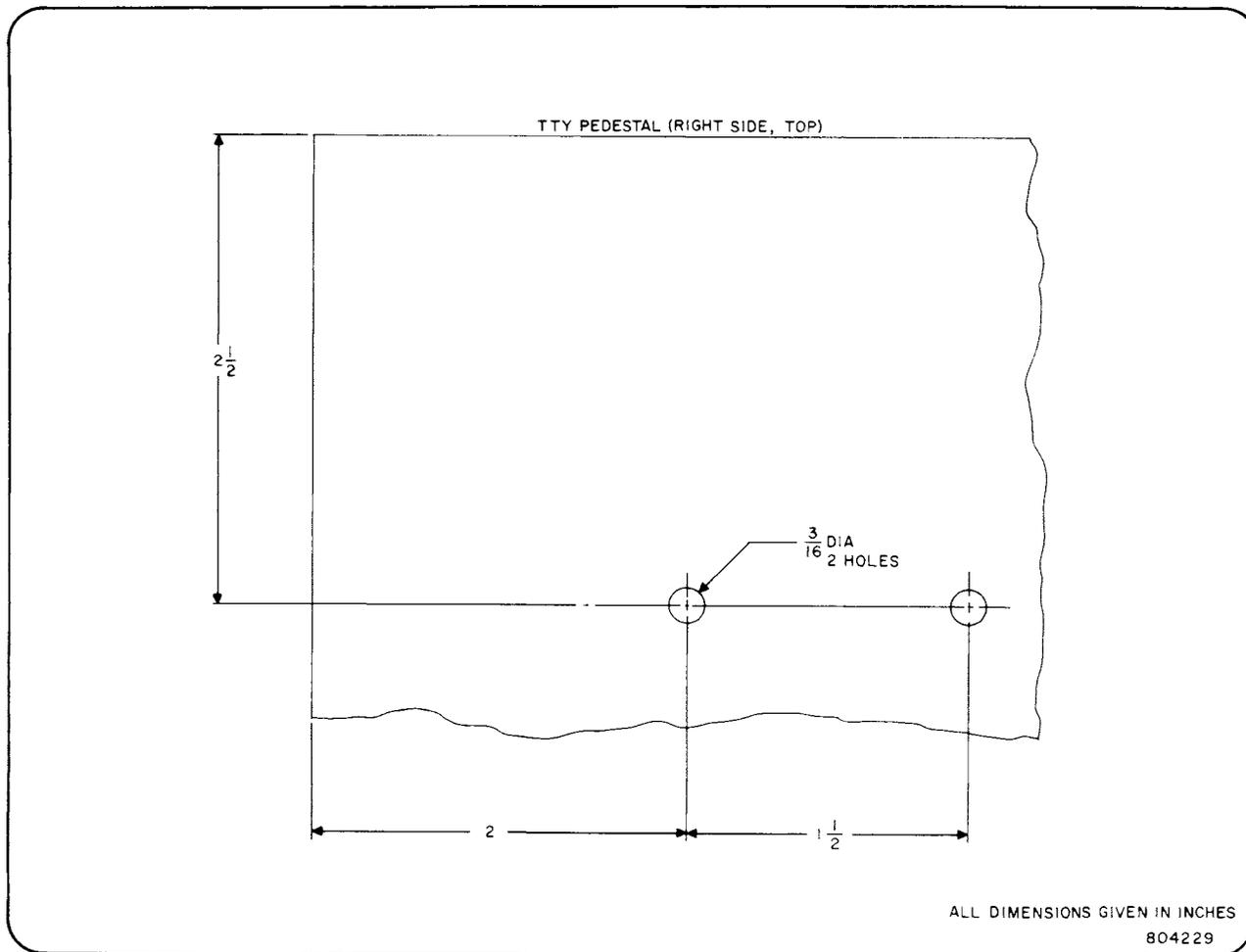


Figure 2-AK. Model 33 Teletypewriter Handset Cradle Drilling Dimensions

2-11-4 DATA SET INSTALLATION

Install the data set in the teletypewriter as follows:

(To Be Supplied)

2-12 DATA SET SYSTEM INSTALLATION FOR MODEL 38 TELETYPEWRITER

The following paragraphs provide the procedures required to install the telephone handset, data set mounting bracket, dial assembly, and data set in the Model 38 teletypewriter. Control panel installation is provided in paragraph 2-15.

2-12-1 TELEPHONE HANDSET INSTALLATION

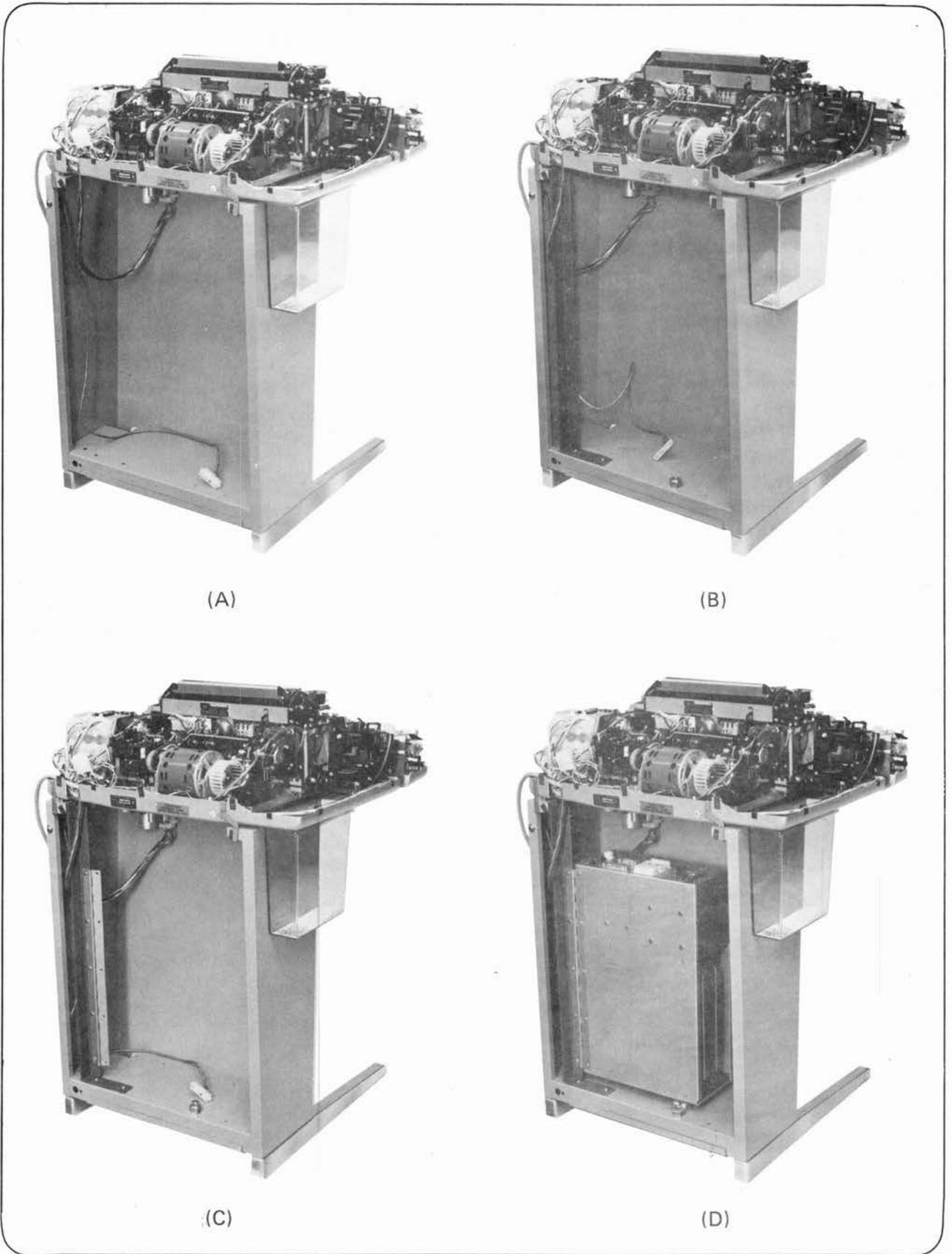
Install the telephone handset phone jack and handset holder as follows:

(To Be Supplied)

2-12-2 MOUNTING BRACKET INSTALLATION

Install the data set mounting bracket as follows:

(To Be Supplied)



(A)

(B)

(C)

(D)

Figure 2-AL. Data Set Installation Into Pedestal

**2-12-3 DIAL ASSEMBLY INSTALLATION**

Install the dial assembly over the call control unit as follows:

(To Be Supplied)

**2-12-4 DATA SET INSTALLATION**

Install the data set in the teletypewriter as follows:

(To Be Supplied)

**2-13 DATA SYSTEM CONNECTION**

Refer to figures 4-C through 4-J for the data system connection diagrams. Do not connect AC power to teletypewriter until installation is complete. Do not connect call control panel cables.

**2-14 TELETYPEWRITER REASSEMBLY**

Reassemble the teletypewriter by reversing the procedures provided in paragraph 2-4.

**2-15 CALL CONTROL PANEL INSTALLATION**

Install the supplied call control panel on the teletypewriter as follows:

A. Referring to figures 4-C through 4-J, connect call control panel to mounting cords as required.

B. Install call control panel over call control unit opening in console cover.

**2-16 OPERATIONAL TEST**

Apply power to teletypewriter and call data service center for operational test. If data service center is not available, call another teletypewriter station and transmit and receive random data to ensure operational service.

## 3-0 OPERATION

### 3-1 INTRODUCTION

This section provides the operating instructions for originating, answering, and terminating data calls with the T101CSC Data Set. Operating instructions for alternate voice communication, local mode and out of service mode are also included. The data set is used in two-wire DDD applications with a Model 28, 33, 35, or 38 teletypewriter.

### 3-2 ORIGINATING A DATA CALL

To originate a data call proceed as follows:

- A. Press ORIG pushbutton on attendant circuit. ORIG lamp will light.
- B. When dial tone is heard in monitor, dial call in normal manner.
- C. When call is answered, answer-back tone is heard in monitor followed by typed answer-back identification.
- D. When answer-back is completed, data communication can proceed.

### 3-3 ANSWERING A DATA CALL

To answer a data call proceed as follows:

- A. When speaker emits audible ring signalling an incoming call, teletypewriter motor is turned on automatically.

**NOTE:** When station is in local mode, ANS key must be operated before incoming call can be answered.

- B. After teletypewriter transmits answer-back identification data communication can proceed.

### 3-4 NORMAL OPERATION

The Model 28, 33, 35 and 38 teletypewriters have many operating features. Only those features that apply to data set operation are discussed below.

When the teletypewriter communicates with a station of slower speed, the REST (Restrain) lamp lights whenever the sending speed exceeds the limits of the central office converter. Sending speed should be reduced until the REST lamp goes out. If the sending speed is not reduced after the REST lamp lights, communication will be interrupted by a BREAK signal. The operator must then press the BRK-RLS pushbutton to unlock the keyboard. When transmitting tape (on ASR models), the tape will momentarily stop when the REST lamp lights. When the REST lamp goes out, the tape reader will start again.

If received data transmission must be interrupted due to scrambles or piled up copy, momentarily press the BREAK key. This interrupts communication and lights the BRK-RLS lamp at both stations. When the teletypewriter stops, press the BRK-RLS pushbutton and type your reason for interrupting the transmission.

To clear a BREAK condition press the BRK-RLS pushbutton. Normal data communication may then proceed.

When the paper supply is low in the teletypewriter printing unit, a buzzer sounds. The pushbutton is pressed to silence the buzzer and light the BUZ-RLS lamp. The lamp goes out when a fresh supply of paper is inserted. While the lamp is lighted, the data set will not

automatically answer a call, and the ANS key must be operated to answer the call.

### 3-5 TERMINATING A DATA CALL

To terminate a data call, perform either step A or B listed below:

- A. Press CTRL key and then EOT key, provided call was not placed through DDD operator.
- B. Press CLR (Clear) pushbutton on attendant circuit.

### 3-6 ALTERNATE VOICE COMMUNICATION

The station may be used for voice communication during periods that data is not being transmitted. To carry on voice communication proceed as follows:

- A. Place VOICE/DATA pushbutton in VOICE position. ORIG lamp lights and teletypewriter motor turns on.

**NOTE:** ORIG lamp lights any time VOICE/DATA pushbutton is in VOICE position. This signals an off-hook indication to the station attendant.

- B. When dial tone is heard in handset, dial call in normal manner. Momentarily press CLR pushbutton to clear line if call is misdialed or other station is busy.
- C. When voice communication is completed, place VOICE/DATA pushbutton in DATA position and press CLR pushbutton.

**NOTE:** Failure to place VOICE/DATA pushbutton in DATA position and press CLR pushbutton keeps station off-hook and therefore busied out.

### 3-7 LOCAL MODE OPERATION

The local mode is used for practice typing or perforating tape without transmitting data over the lines. When the teletypewriter is operated in the local mode, the ANS pushbutton must be pressed to answer an incoming call. To condition the station for the local mode, proceed as follows:

- A. Press LCL (Local) pushbutton.
- B. Operation of ORIG or ANS pushbutton mechanically releases the LCL pushbutton and moves station from local mode.
- C. Clear local mode by momentarily pressing CLR pushbutton.

### 3-8 OUT OF SERVICE MODE CONDITIONS

To place the station out of service, set OUT OF SERVICE/NORMAL pushbutton to OUT OF SERVICE position. Out of service lamp should light and stay lighted as long as the station is out of service. While the station is out of service, incoming calls encounter a "don't answer" condition. The speaker emits an audible ring signal, but the incoming call is not answered.

To restore the station to service, set the OUT OF SERVICE/NORMAL pushbutton to the NORMAL position. Verify that station is restored to service by pressing the ORIG pushbutton. Dial tone is heard in the speaker when station is restored to service. Press the CLR pushbutton to return station to idle condition.

## 4-0 DRAWINGS AND DIAGRAMS

### 4-1 INTRODUCTION

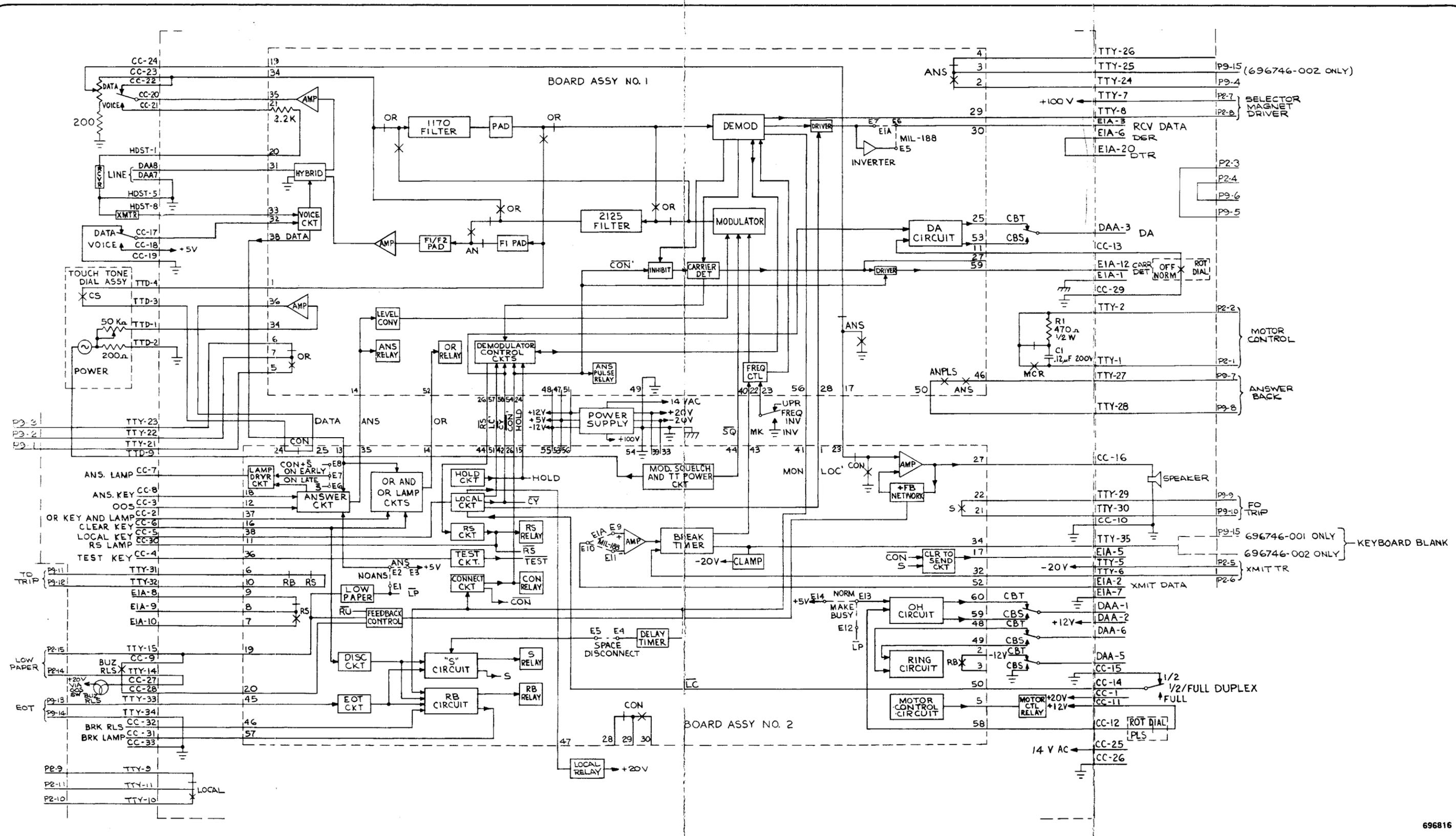
This section provides the interconnection cable wiring diagrams, data set simplified functional block diagram, and connection diagrams for the T101CSC Data Set System. The following is a list of drawings and diagrams included in this section.

Figure Number	Figure Title
4-A	Data Set System Interconnection Cable Wiring Diagrams
4-B	Data Set Simplified Functional Block Diagram
4-C	Data Set System Connection Diagram With Rotary Dial, Without Card Dialer, and With CBS DAA
4-D	Data Set System Connection Diagram With Rotary Dial, Without Card Dialer and With CBT DAA
4-E	Data Set System Connection Diagram With Rotary Dial, With Card Dialer, and With CBS DAA
4-F	Data Set System Connection Diagram With Rotary Dial, With Card Dialer, and With CBT DAA
4-G	Data Set System Connection Diagram With Tone Dial, Without Card Dialer, and With CBS DAA
4-H	Data Set System Connection Diagram With Tone Dial, Without Card Dialer, and With CBT DAA
4-I	Data Set System Connection Diagram With Tone Dial, With Card Dialer, and With CBS DAA
4-J	Data Set System Connection Diagram With Tone Dial, With Card Dialer, and With CBT DAA

1

2

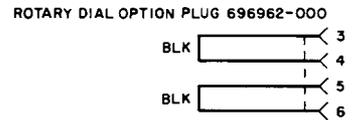
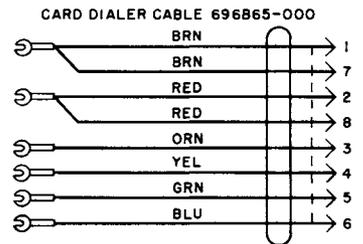
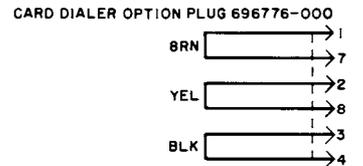
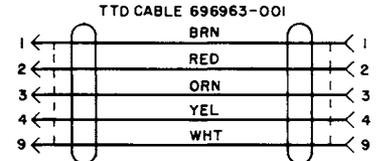
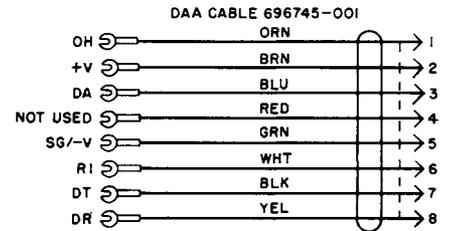
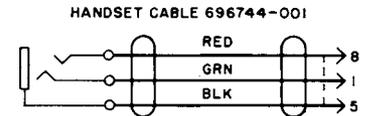
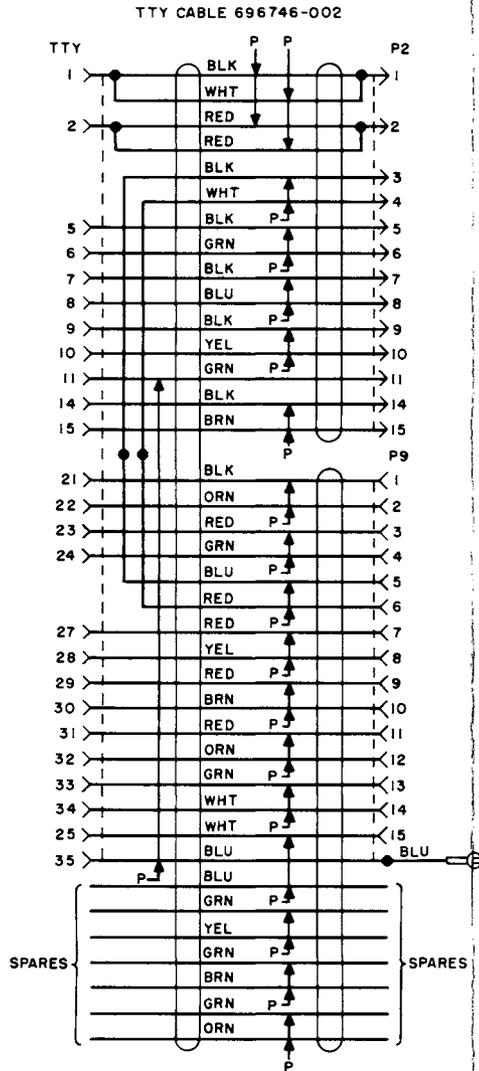
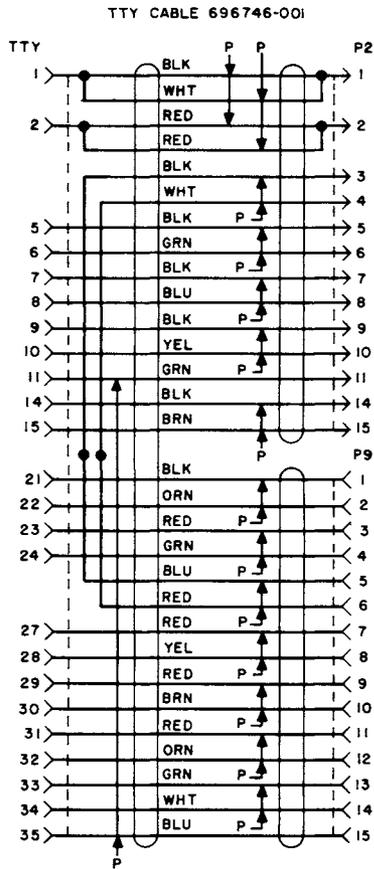
3

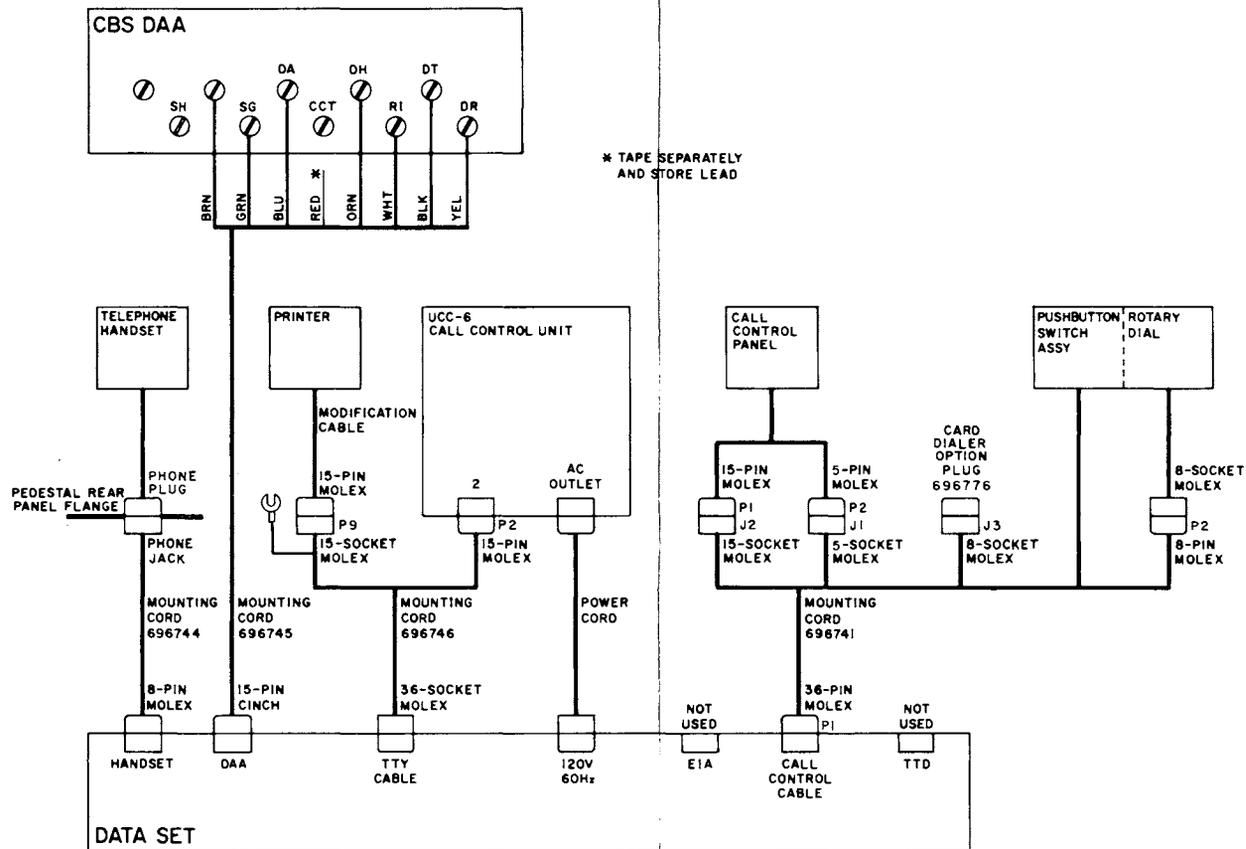


696816

Figure 4-B. Data Set Simplified Functional Block Diagram







804263

Figure 4-C. Data Set System Connection Diagram  
With Rotary Dial, Without Card Dialer,  
and With CBS DAA

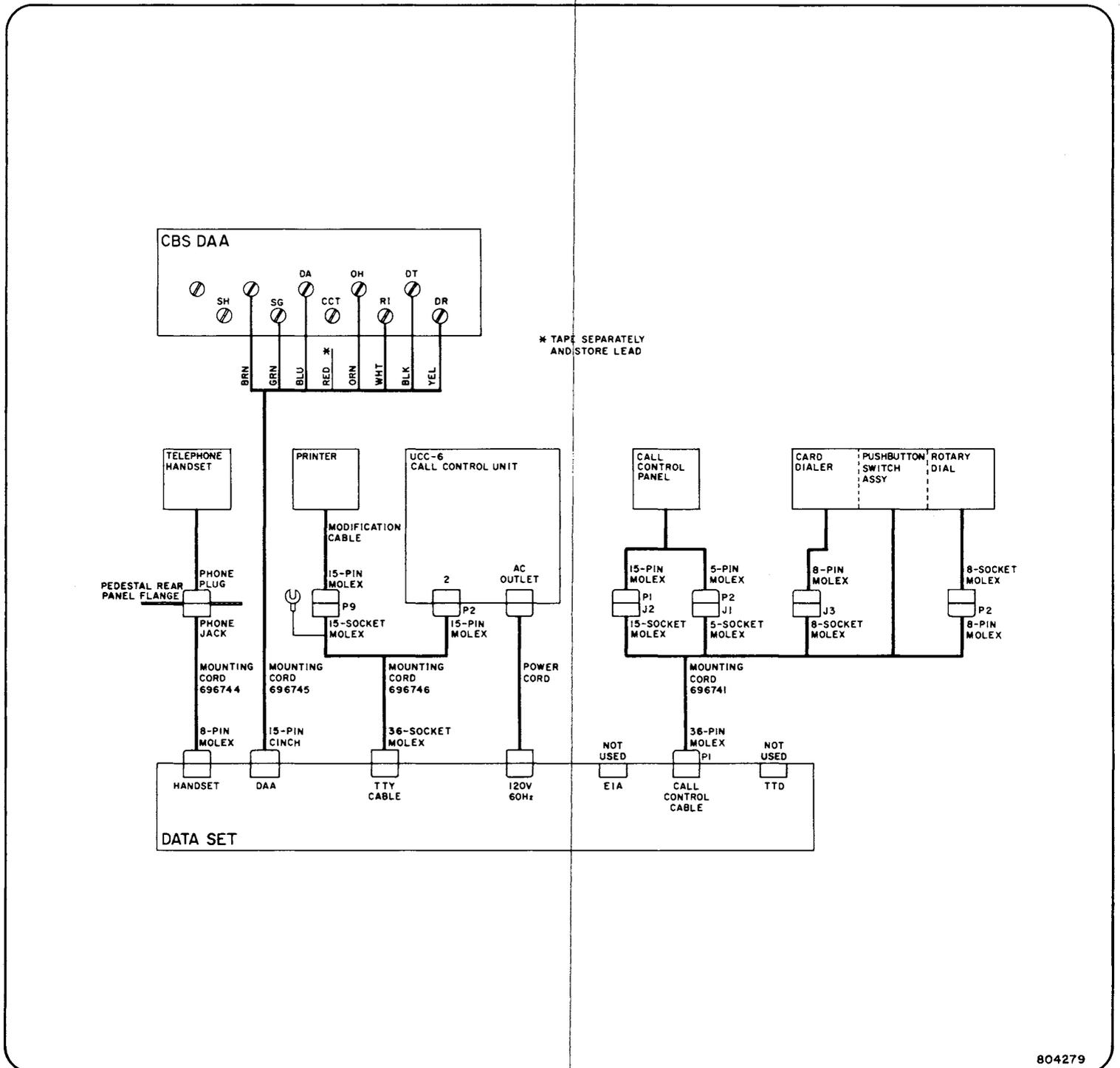
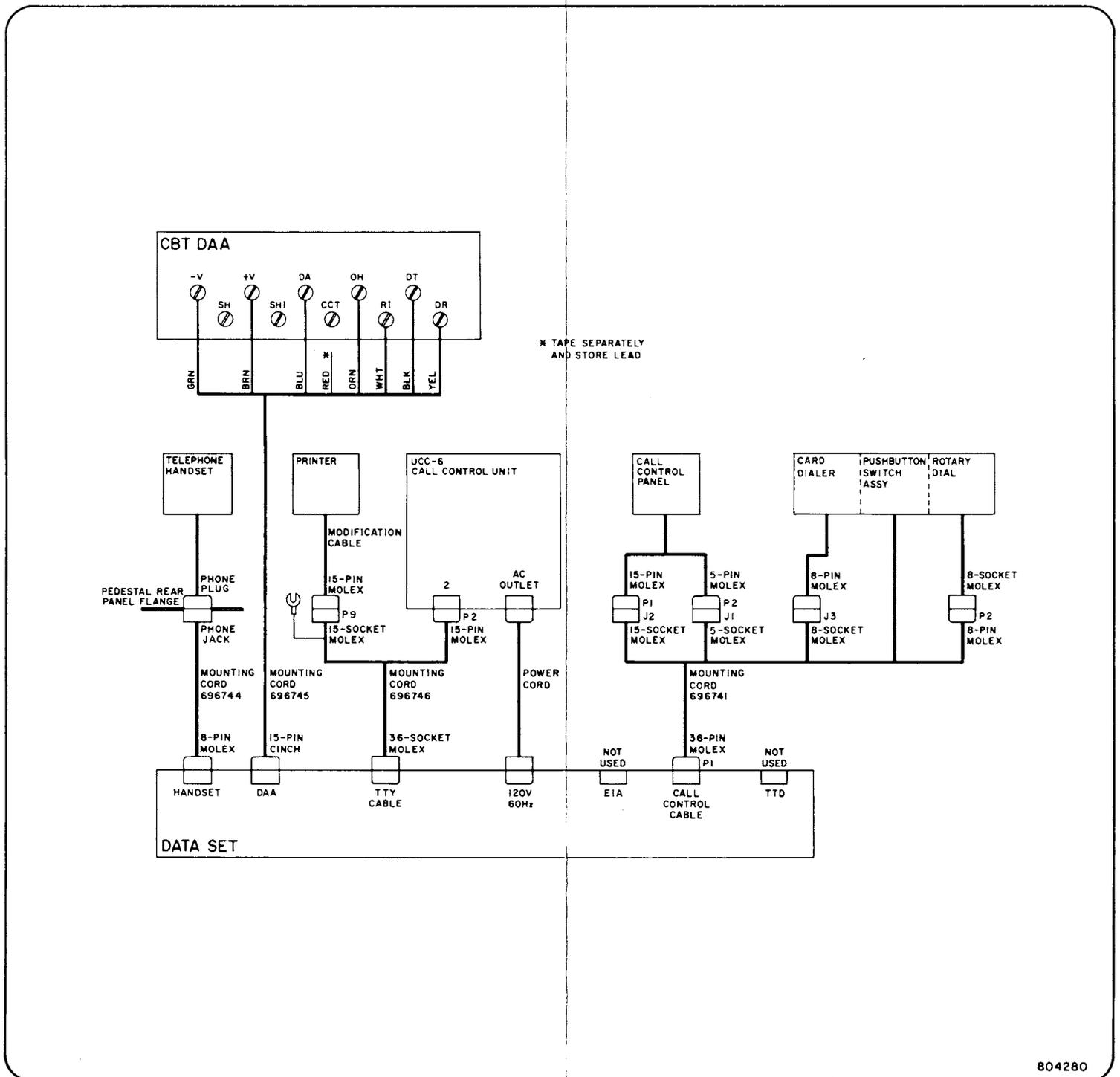


Figure 4-E. Data Set System Connection Diagram  
With Rotary Dial, With Card Dialer,  
and With CBS DAA



804280

Figure 4-F. Data Set System Connection Diagram With Rotary Dial, With Card Dialer, and With CBT DAA

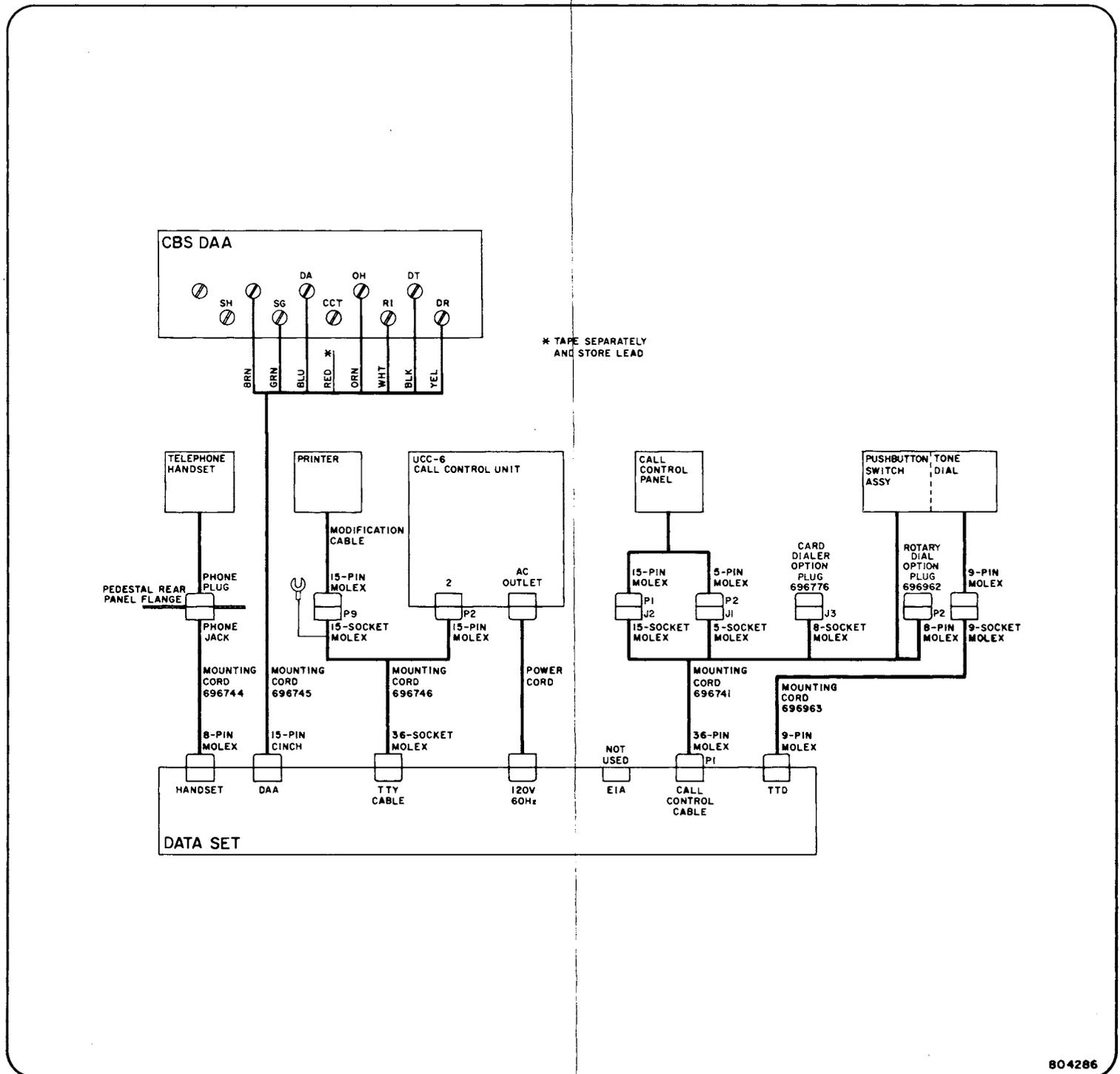
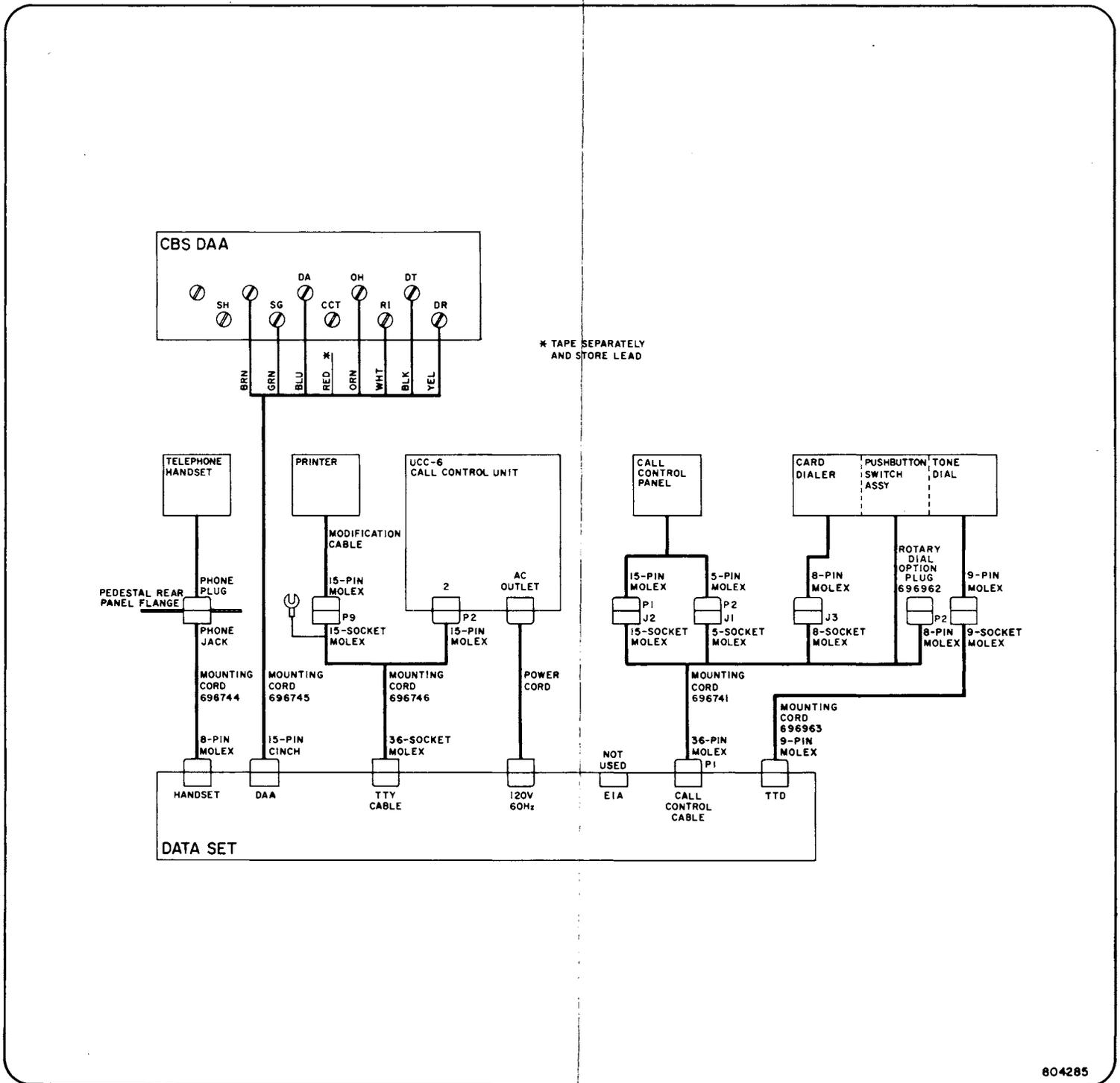


Figure 4-G. Data Set System Connection Diagram  
With Tone Dial, Without Card Dialer,  
and With CBS DAA





804285

Figure 4-1. Data Set System Connection Diagram With Tone Dial, With Card Dialer, and With CBS DAA

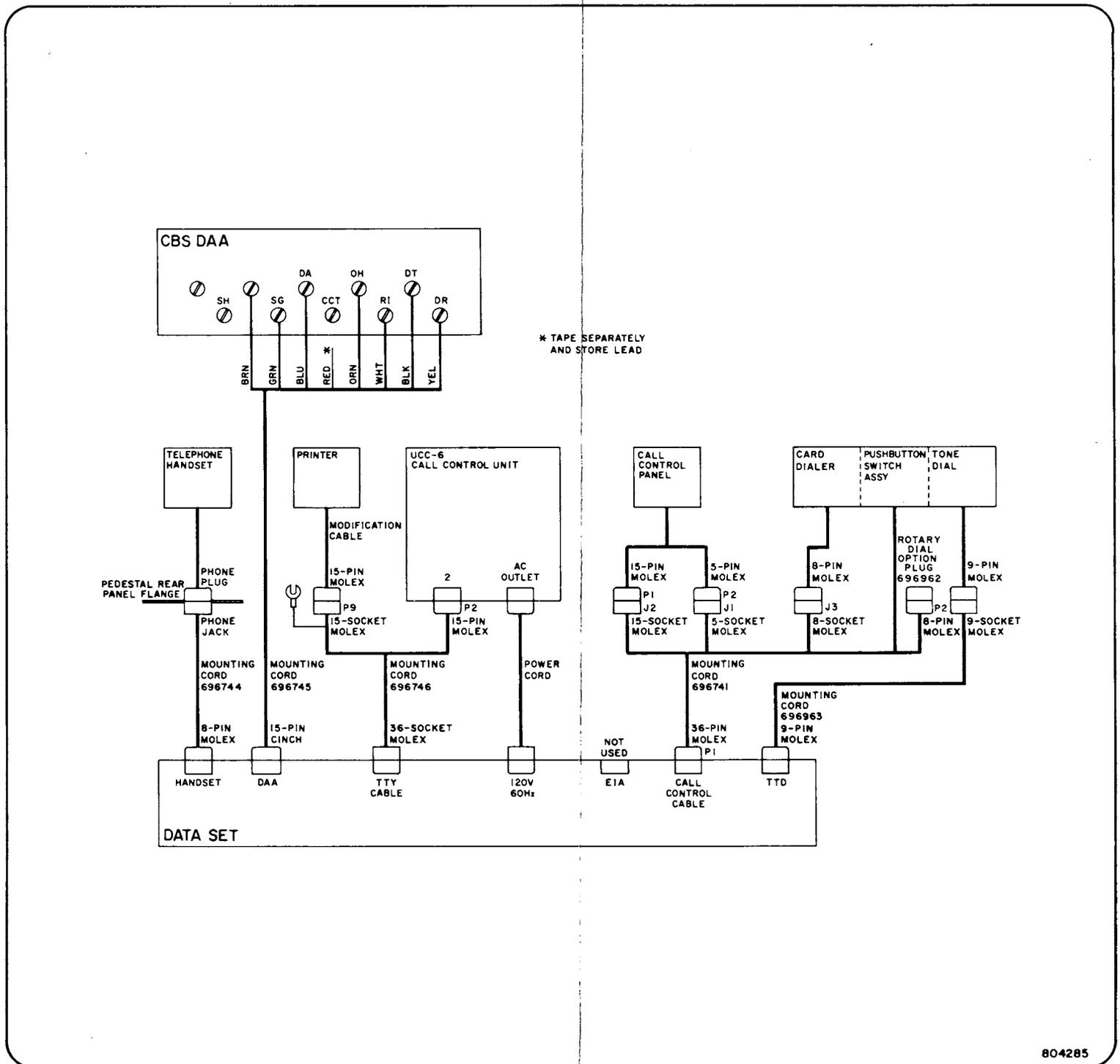


Figure 4-I. Data Set System Connection Diagram  
 With Tone Dial, With Card Dialer,  
 and With CBS DAA

804285

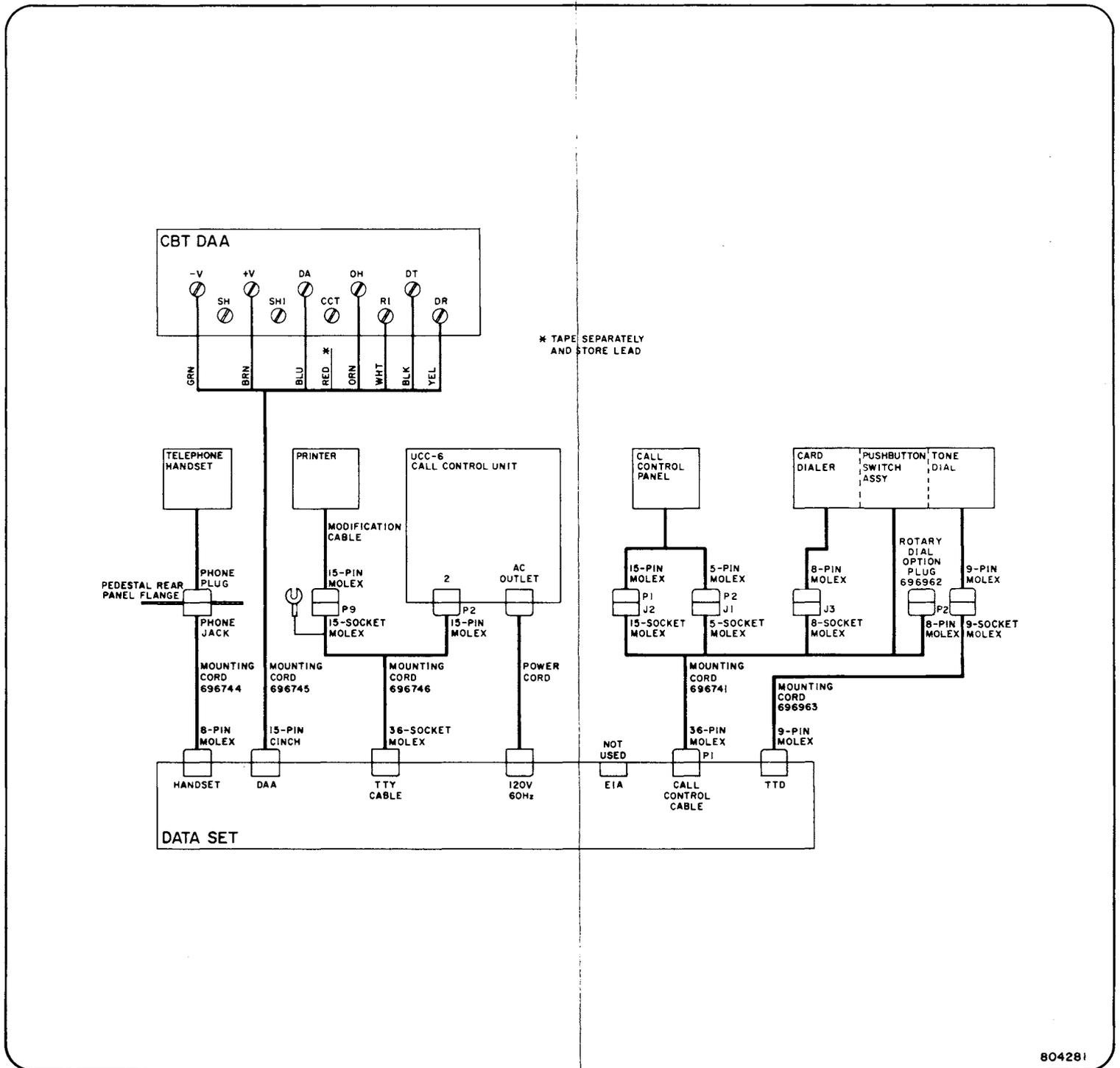


Figure 4-J. Data Set System Connection Diagram  
With Tone Dial, With Card Dialer,  
and With CBT DAA

804281