## 33 AND 35 TELETYPEWRITER STATIONS FOR GENERAL PURPOSE

## POINT-TO-POINT PRIVATE LINE SERVICE

## INSTALLATION AND CHECKOUT

## 1. GENERAL

1.01    This section contains information for station installation of 33 and 35 teletypewriters, and applicable data sets arranged for private line service. It also contains checkout procedures to verify station operation. It is reissued to provide modification kits that are necessary to implement point-to-point private line service and the line control procedures specified in ANSI (American National Standards Institute X3.3.4/212) document. The interface provided by TP186670 modification kit is EIA (Electronic Industries Association) Standard RS-232-C. Since this is a general revision, marginal arrows that indicate changes or additions, have been omitted.

1.02    In this section all references to direction mean the station as being viewed from the operator's position in front of the teletypewriter.

## 2. MODIFICATION KIT TP186670

### GENERAL

2.01    Modification kit TP186670 is used with certain Model 33 or Model 35 teletypewriters. It is attached to the call control unit in Model 33 or to the cabinet in Model 35 on the right side of the teletypewriter. It mounts in front of call control unit UCC29 and is housed under the teletypewriter cover.

### OPTIONS

2.02    Circuit card assemblies TP303831 and TP303832 contain four factory-wired options for modification kit TP186670. See Table A for option and corresponding strap, circuit card, and wiring diagram location.

### TABLE A

OPTIONS FOR MODIFICATION KIT TP186670

| OPTION | STRAP | CIRCUIT CARD | WIRING DIAGRAM LOCATION |
|---|---|---|---|
| EOT Disconnect | ST1 | TP303831 | B4 |
| Idle Line Disconnect | ST2 | TP303832 | B5 |
| Local Break Override | ST3 | TP303832 | D5 |
| Duplex/Half-Duplex | ST4 | TP303832 | D5 |

3.  MODEL 33 INSTALLATION

A.  Preparation

3.01    Perform the following steps before installation:

(1) Remove the nameplate from front of teletype-
    writer.

(2) Remove screws holding the Model 33 cover to its
    base (front and rear). On ASR sets remove setscrew
from rear cover of tape reader.

(3) Unthread and remove any paper or paper tape
    from teletypewriter.

(4) Remove platen knob.

(5) Lift and remove cover from teletypewriter.

B.  Card Connector TP181819 Modification

3.02    The following procedures refer to Figure 1.

(1) Remove two screws TP181241 from UCC29
    bracket.

(2) Move card connector TP181819, with its bracket,
    forward until it clears the UCC29 bracket. Cut
yellow wire between pins F and H from card connector.

(3) Return card connector, with its bracket, to original
    position. Replace screws removed in step (1).

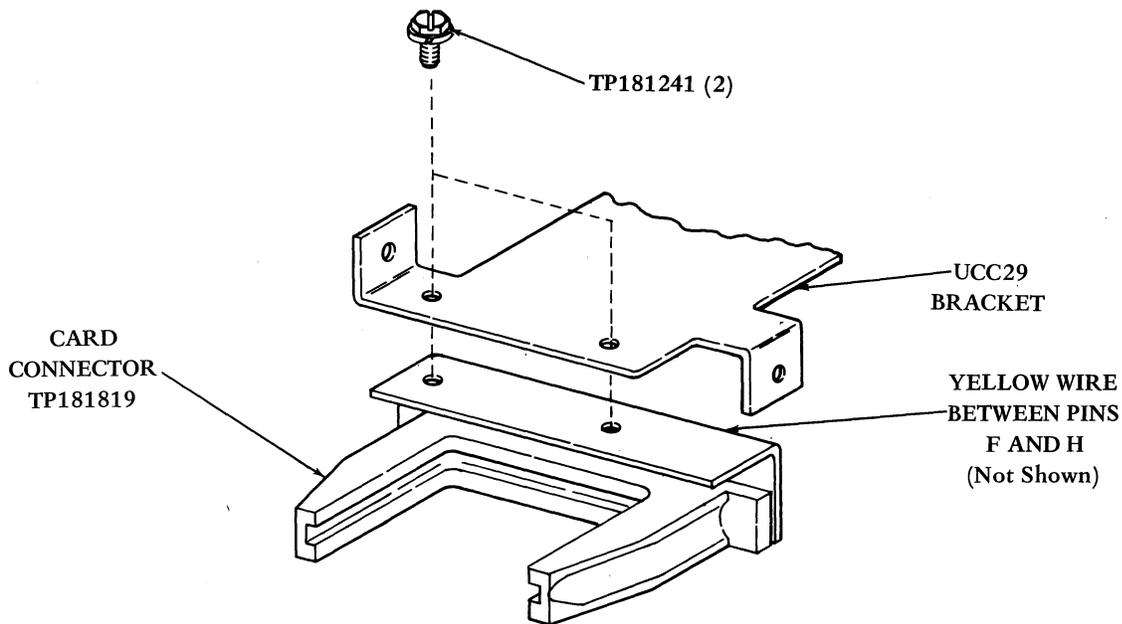(4) Install break detector circuit card TP303833 in
    card connector.

C.  Lamp Assembly TP186690

3.03    The following procedures refer to Figure 2.

(1) Mount lamp assembly bracket TP336462 vertically
    against UCC29 power supply.

(2) Fasten lamp assembly bracket to UCC29 baseplate
    with two flat washers TP7002, two lockwashers
TP2191, and two hex posts TP336461.

(3) Position lamp assembly bracket until hex posts are
    at center of mounting slots. Leave hex posts loose
enough to adjust lamp assembly bracket.



TP181241 (2)

UCC29
BRACKET

CARD
CONNECTOR
TP181819

YELLOW WIRE
BETWEEN PINS
F AND H
(Not Shown)

(Right Side View)

Figure 1 - Card Connector TP181819 Modification

RED LENS

GREEN LENS

PILOT LAMP
PLATE
TP336460

PILOT LAMP BRACKET
TP336465

TP181241 (4)

LAMP ASSEMBLY
BRACKET
TP336462

UCC29
POWER
SUPPLY

TP181241

TP336493

TP181240 (2)

TP336461 (2)

TP2191 (2)
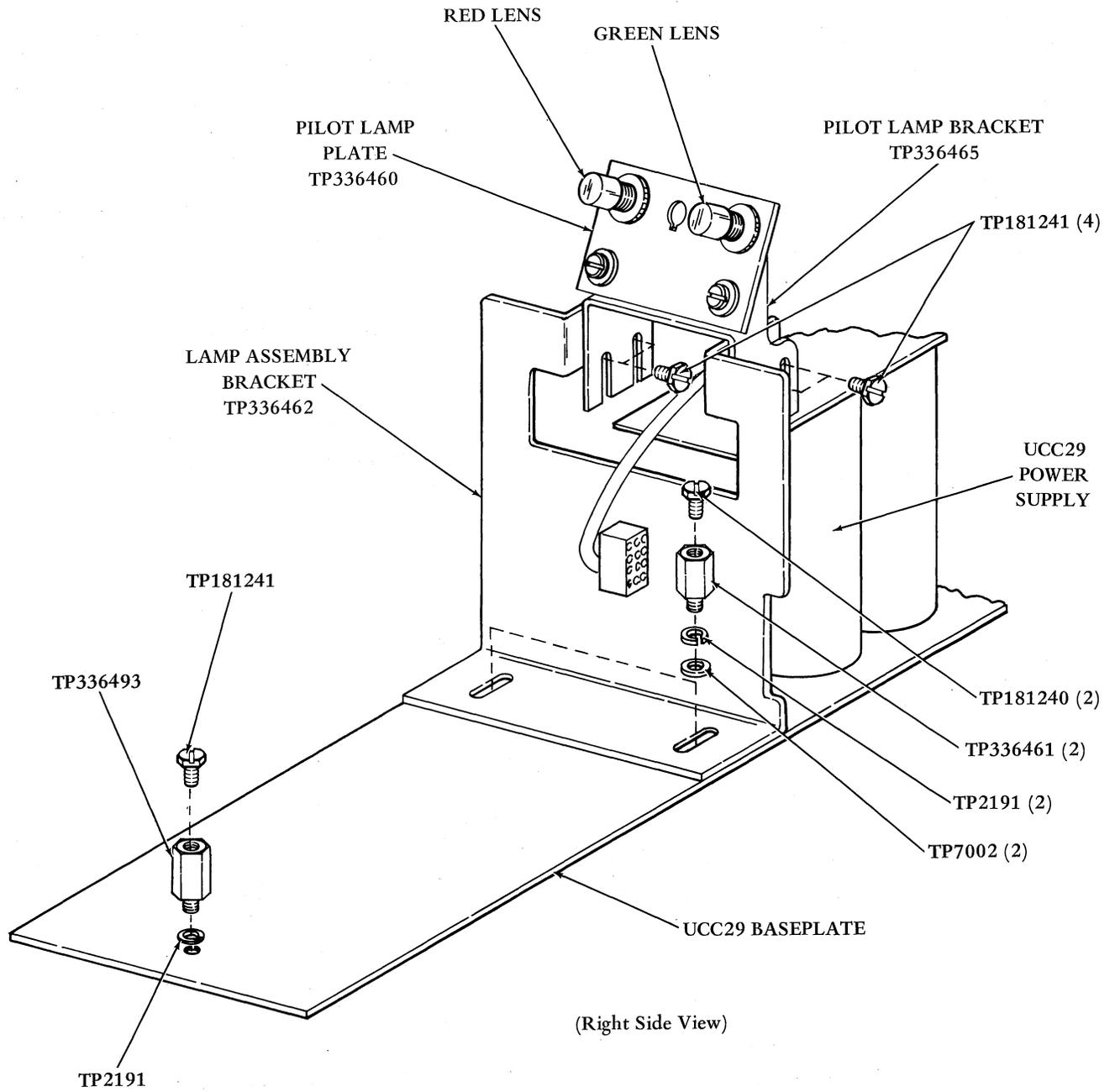
TP7002 (2)

UCC29 BASEPLATE

(Right Side View)

TP2191

Figure 2 - Lamp Assembly TP186690 Installation

(4) Loosen four screws TP181241 friction tight without changing position of lamp assembly bracket.

(5) Put teletypewriter cover in place. Set the faceplate (TP186672 or TP341362) over call control unit UCC29. Adjust forward-backward position of lamp assembly bracket until "floating" faceplate is approximately centered.

(6) Remove faceplate. Adjust lamp assembly bracket vertically until bottom edge of lens are just below outer edge of teletypewriter cover.

(7) Remove teletypewriter cover. Without changing any adjustment, tighten screws and hex posts.

D. Logic Package TP186680 Installation

3.04 The following procedures pertain to installation of logic package TP186680 (Figures 2 and 3).

(1) Install hex post TP336493 and lockwasher TP2191 at front and center of UCC29 (Figure 2).

(2) Place logic package on hex posts. Install three screws TP181241 friction tight to allow positioning of logic package.

(3) Set faceplate (TP186672 or TP341362) over logic package with indicator lenses of key assembly TP186683 protruding through their respective positions. Slide logic package as far forward as free motion of "floating" faceplate will permit. Without disturbing adjustment, remove faceplate.

(4) Note gap at rear edge of logic package mounting bracket. Slide logic package toward rear until gap is reduced to half. Tighten three screws TP181241.

(5) Loosen two screws TP181241 fastened to key bracket TP186681 (Figure 3). Place key bracket to lowest position. Replace teletypewriter cover.

(6) Raise key bracket until it is just short of touching cover. Key assembly TP186683 and its plastic collar TP336334 should protrude through cutout in cover.

PLASTIC COLLAR
TP336334

KEY BRACKET
TP186181

KEY ASSEMBLY
TP186683

TP181241 (2)

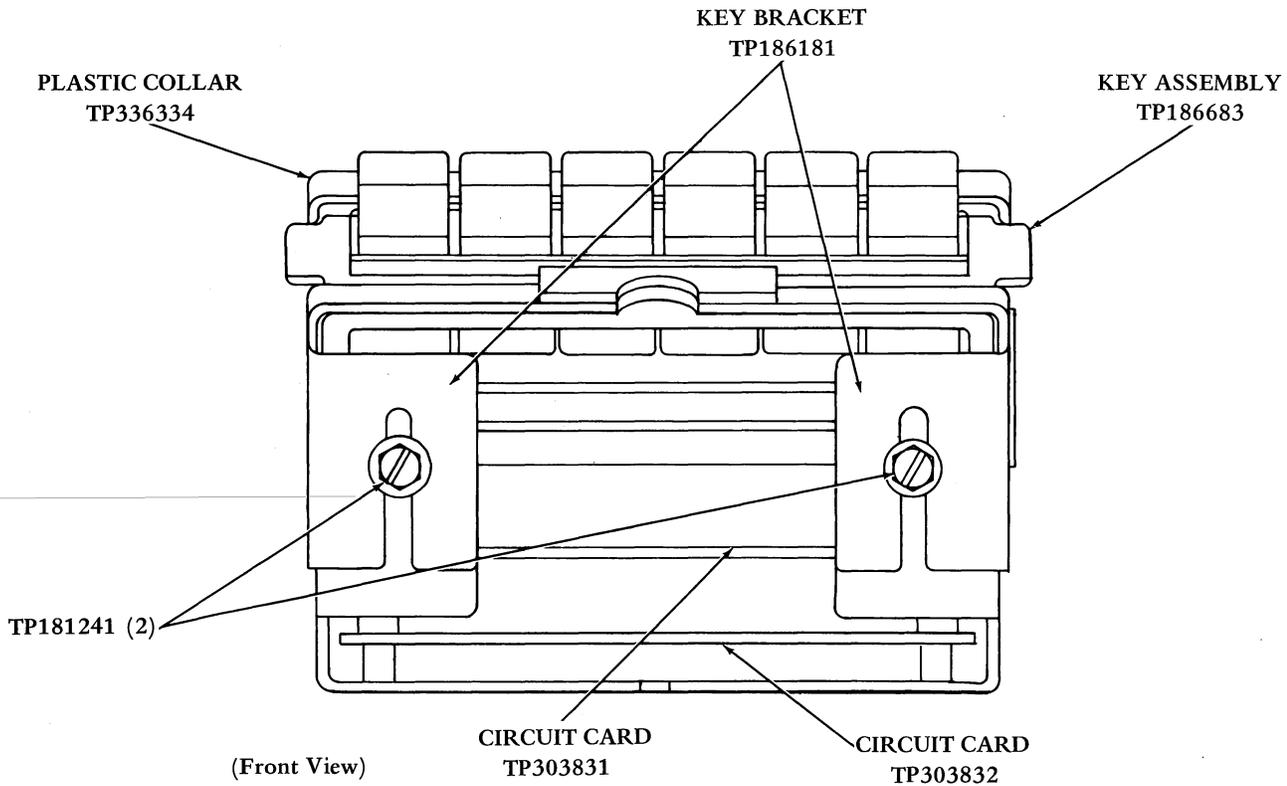(Front View)

CIRCUIT CARD
TP303831

CIRCUIT CARD
TP303832

Figure 3 - Logic Package Installation

(7) Without disturbing key bracket TP186681, remove teletypewriter cover. Tighten screws loosened in step (5).

E. Cables

3.05 Following are procedures for routing and connecting cables.

(1) Plug connector on end of 3-wire cable assembly TP186677 into lamp bracket cable assembly TP186689.

(2) Remove UCC29 mounting screw adjacent to selector magnet driver card connector.

(3) Route EIA interface cable TP186671 in trough between UCC29 and its base. Insert mounting screw through wire loop on strain relief. Lay cable between mounting screw and UCC29. Tighten screw.

(4) Plug EIA interface cable TP186671 into 6-pin connector TP182650 on circuit card TP303831.

(5) Mate connectors 1 and 2 of cable TP336464 to connectors 1 and 2 on UCC29. Dress cable in trough between UCC29 and its base. Mate connectors on other end of cable TP336464 to corresponding connectors on circuit card TP303831.

(6) On Model 33 KSR and RO Sets only, a TP187129 connector assembly must be connected to 15-point connectors CAG (no. 5) and CAF (no. 6) on the call control to enable the green proceed lamp to operate. Perform checkout procedures given in Part 5, A. 33 Stations (Off-Line).

F. Data Sets 108- and 109-Type

3.06 After the modification kit strapped options have been selected for removal or retention, install data set and circuit pack AR17 in DAS 820D-L1A. For related information of data sets 108- and 109-types, see Section 591-023-201 and 591-024-201 respectively.

3.07 Remove rear panel of teletypewriter set by removing two top screws.

3.08 The following procedures, (1) through (5), refer to Figure 4 for installation of bracket 102A, backboard 180A, and DAS 820D-L1A into the teletypewriter pedestal.

(1) Position bracket 102A inside pedestal and tighten screws.

(2) Mount backboard 180A on bracket 102A and tighten screws.

(3) Firmly seat data set and circuit pack AR17 in DAS 820D-L1A.

(4) Loosen spring clips on backboard 180A and position DAS 820D-L1A as shown.

(5) Check that DAS 820D-L1A baseplate is under spring clips and tighten spring clip screws.

Note: If a data set 101C-type had been previously installed, retain slide brackets and mount DAS 820D-L1A on them.

3.09 The following procedures are wiring and cable connections between DAS 820D-L1A and the teletypewriter.

CAUTION: DISCONNECT POWER FROM TELETYPEWRITER.

3.10 Connect end of data auxiliary set power cord M3AY to terminal strip at right rear of teletypewriter as follows:

(a) Green wire to terminal 1
(b) White wire to terminal 2
(c) Black wire to terminal 4

3.11 Replace teletypewriter cover by reversing procedures in 3.01. Connect other end of data set power cord M3AY to DAS 820D-L1A.

3.12 Connect interface cable TP186671 to connector J3 of DAS 820D-L1A.

G. 1A Data Station Single Channel Arrangement

3.13 The 1A data station is contained in a 31A2 data mounting and is mounted into a 33 or 35 teletypewriter with brackets 100A and 101A respectively (Figure 5). The mounting brackets each contain hardware and a fixed mounting stud that is part of the bracket. For additional information concerning the 1A data station, refer to Section 591-813-201.

3.14 For the 33 teletypewriter, secure 31A2 data mounting to bracket 100A and mount in pedestal of teletypewriter.

3.15 For the 35 teletypewriter, secure 31A2 data mounting to bracket 101A and mount to relay rack provided in cabinet 35A or 35B.

3.16 Connection of a 1A data station to a 4-wire line or a 2-wire line facility is made on screw terminals at TS(A) on 31A2 data mounting (Tables B and C). Connection to an externally mounted test key and lamp (TEST and CF)
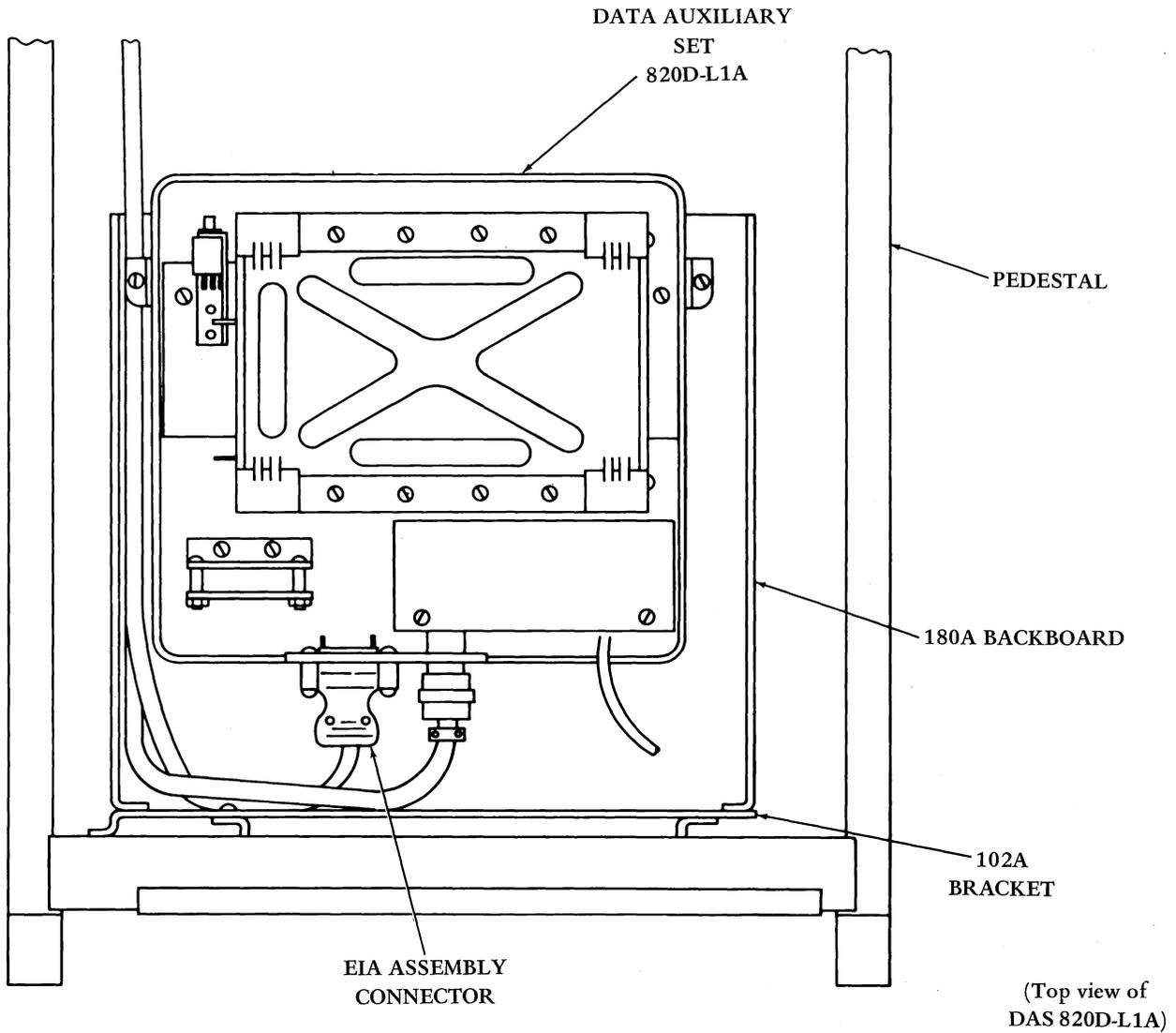
DATA AUXILIARY
SET
820D-L1A

PEDESTAL

180A BACKBOARD

102A
BRACKET

EIA ASSEMBLY
CONNECTOR

(Top view of
DAS 820D-L1A)

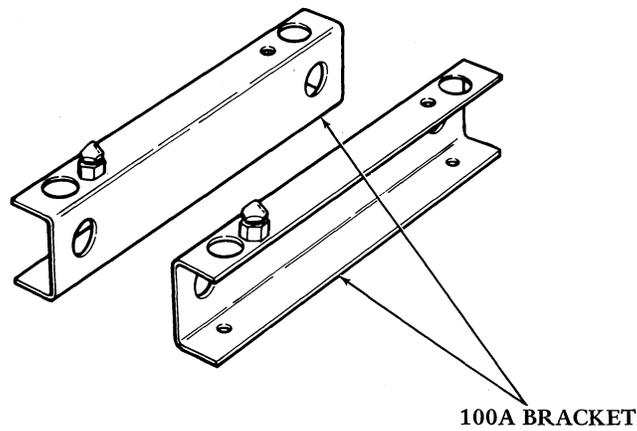Figure 4 - Mounting of DAS 820-L1A on 33 Set

100A BRACKET

Figure 5 - Mounting Brackets

is also made on screw terminals at TS(A) on 31A2 data mounting (Table D). Connection of the 1A data station to the teletypewriter is made through cable TP336601, and receptacle J5 on 31A2 data mounting.

TABLE B

4-WIRE LINE CONNECTIONS

| COLOR CODE OF WIRES IN D4BD-49 CABLE | CONNECT TO 31A2 DATA MOUNTING TS(A) TERMINAL NUMBER |
|---|---|
| G | 2 |
| R | 3 |
| Y | 4 |
| BK | 5 |

3.17 For a 4-wire facility, connect wires of D4BD-49 cable to TS(A) on 31A2 data mounting as shown in Table B.

3.18 For a 2-wire facility, connect wires of D4BD-49 cable to TS(A) on 31A2 data mounting as shown in Table C.

TABLE C

2-WIRE CONNECTIONS

| COLOR CODE OF WIRES IN D4BD-49 CABLE | CONNECT TO 31A2 DATA MOUNTING TS(A) TERMINAL NUMBER |
|---|---|
| G | 2 |
| BK | 5 |
| R ⎱ (Note 1) | 3 ⎱ (Note 2) |
| Y ⎰ | 4 ⎰ |

Note 1: Tape ends of R and Y wires and store.

Note 2: Terminals 3 and 4 are not used.

3.19 To interconnect the 1A data station with the voice band loop around (VBLA) test key and lamp (TEST and CF) on the teletypewriter, connect wires of D6AD-61 cable to TS(A) on 31A2 data mounting as shown in Table D.

4. MODEL 35 INSTALLATION

A. TP336474 Modification Kit

4.01 To assemble the UCC29 call control unit on 35 sets, certain modifications must be made to the set. TP336474 modification kit provides these modifications.

TABLE D

INTERCONNECTIONS FOR 1A DATA STATION – VBLA TEST KEY AND LAMP ON TELETYPEWRITER

| COLOR CODE OF WIRES IN D6AD-61 CABLE | CONNECT TO 31A2 DATA MOUNTING TS(A) TERMINAL NUMBER |
|---|---|
| G-W | 6 |
| O-W | 7 |
| W-O | 8 |
| W-BL | 9 |
| W-G | 10 |

4.02 Remove two TP192274 pan head screws which secure the cover latch and replace them with two shorter TP129505 screws (Figure 6).

4.03 Remove and discard the elapsed time indicator and bracket from the UCC29.

4.04 Remove power cord from UCC29 by disconnecting three terminals from the CZ terminal strip (refer to 8162WD):

Black wire – CZ-4
White wire – CZ-2
Green wire – CZ-1 ground screw

Slip TP103092 cord connector on power cord. Reconnect power cord to terminal strip CZ.

Note: The procedure in 4.05 may be omitted if the TP340011 modification kit is to be installed.

4.05 Install the TP185718 diode assembly on the UCC29 in series with the motor control relay (CV) by:

(1) Removing the metal jumper between terminals 5 and 6 on CZ terminal strip.

(2) Move black and slate wires on CZ-6 to CZ-5.

(3) Move black wire on CZ-8 to CZ-6.

(4) Place the TP185718 diode assembly between CZ-6 and CZ-8 with the cathode end on CZ-6.

On ASR sets, solder the slate lead of TP336958 wire assembly to break detector card connector (CN), terminal A, if UCC29 is not already so equipped. Route the slate lead along the left side of the UCC29, to pin CAA7 (connector no. 4). On KSR and RO sets, this slate lead may be omitted.
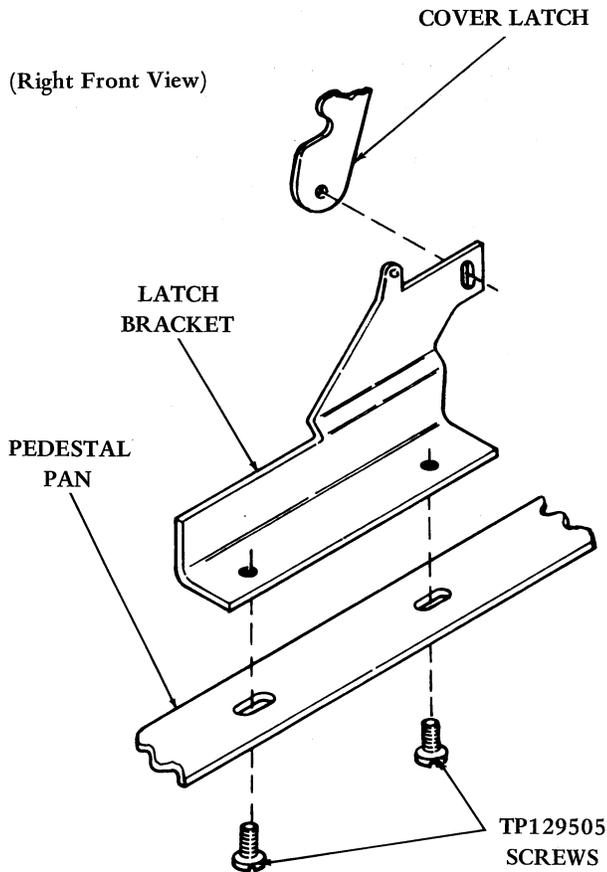
(Right Front View)

COVER LATCH

LATCH
BRACKET

PEDESTAL
PAN

TP129505
SCREWS

Figure 6 - Cover Latch Assembly

4.06    Mount the UCC29 on the right side of the set with five TP181241 screws with lockwashers. Connect the ground lead from the UCC29 to the cabinet.

4.07    Relieve strain on signal line cord coming out of the UCC29 with a TP181241 screw with lockwasher and a TP125015 flat washer securing the TP121245 cable clamp in the tapped hole through the baseplate.

4.08    Remove the relay rack from the pedestal to ease assembly of TP336497 cable.

4.09    Interconnect the ESU and the UCC29 call control unit as follows:

(a)    Mate connectors 3, 4, 5, 6, 7, and 8 of TP336497 cable with corresponding connectors on UCC29.

(b)    Push the Molex connectors of both the 35T ESU cable and the TP336497 cable through the right rear hole of the cabinet into the pedestal.

(c)    On ASR sets, mate the connectors of the ESU cable with connector 3, 4, 6, 7, and 8 of cable TP336497. On KSR sets with 35A ESU, or on RO sets with 35C ESU, mate plugs 6, 7, and 8 only.

(d)    Position cables so that the set cover can be freely closed. Replace relay rack.

(e)    For ASR sets, remove the 3.2 ampere fuse and label on the UCC29 and replace with 6.25 ampere fuse (SL-BL) TP161136 and label TP185686. For KSR and RO sets, remove the 3.2 ampere fuse and label from the UCC29 and replace with 4 ampere SL-BL fuse TP129919 and label TP185684.

4.10    Mount the TP181879 transformer and fuse as follows:

(a)    Mount transformer TP181879 loosely to mounting plate TP336495 with four screws with lockwashers TP181241 and four flat washers TP125015.

(b)    Insert fuse holder TP182182 in hole on mounting plate. Insert 1/2 ampere SL-BL fuse in fuse holder and affix fuse label TP185679.

(c)    Connect transformer cable TP336498 to terminals (Figure 7).

(d)    Connect fuse (Figure 8). Use two insulated slip on terminals on transformer cable assembly TP336498 for the fuse.

(e)    Place insulator TP336496 under the four mounting plate flat washers and tighten screws.

(f)    Mount assembled plate with transformer at center of relay rack with two screws TP165103 and speed nuts TP153017. Route the transformer cable TP336498 through the left rear opening in the cabinet and also through the ESU container. Connect these leads to the "C" wiring field of the ASR, KSR, and RO as follows:

| ASR* | KSR | RO |
|------|-----|-----|
| P to 3R | P to 3L | P to 3L |
| S to 1T | S to 1N | G to 5G |
| G to 7L | G to 2G | S to 1N |
| Y to 5E | Y to 4AA | Y to 4AA |
| O to 6E | O to 5AA | O to 5AA |
| | R to 2E | R to 2D |

*Disconnect, tape and tie back the green/slate lead from E2 on the ASR and connect the red lead to 2E.

(g)    Disconnect W-R-S wire from C-7E, reroute wire through cutout on the H through T terminal board, and connect it to C-3P.

AG-1-BL

C-5E-Y (ASR)
(4AA on KSR)

C-L7-G (ASR)
(G2 on KSR)
(G5 on RO)

C-E2-R (ASR, KSR)
(D2 on RO)
(Tape Back G-S on ASR Only)

(TR)

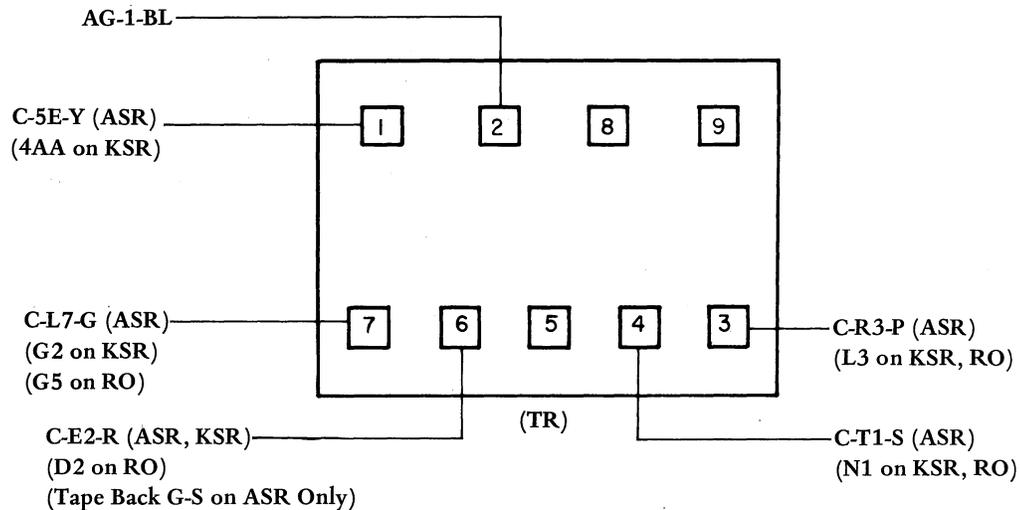C-R3-P (ASR)
(L3 on KSR, RO)

C-T1-S (ASR)
(N1 on KSR, RO)

Figure 7 - TP181879 Transformer Connections (10-14-48 v ac)

4.11 Modify the 35K or the 35L typing units for the reader stop on EOT feature by assembling the following parts:

(a) Install TP192466 EOT function bar, one TP153604 function pawl, one TP4703 spring, one TP157240 spring, and one TP72522 wick in slot number 24 of AVA stunt box.

Note: Install the TP153604 function pawl with the long arm first.

(b) Replace the TP152653 function pawl in slot 25 with the TP153598 function pawl.

4.12 Modify the 35 set for new line feature. Modification kit TP336474 includes function bar TP192471, and modification kit TP334884. Modify sprocket feed set with modification kit TP334884; modify friction

1/2 AMP SL-BL

(1)

C-6E-O
(5AA on KSR)

(2)

TR-2-BL

INSULATED SLIP-ON
TERMINALS

Figure 8 - Fuse Holder (AG)

feed set with modification kit TP334884 except omit function bars in the kit and replace them with function bar TP192471. Modify sprocket feed set as follows:

(a) Remove the stunt box per Section 574-220-702.

(b) Remove CR function bar TP192459 from slot 5 and retain associated parts.

(c) Install CR-FF function bar TP192477 and associated parts in slot 5.

(d) Install LF-VT function bar TP192472 in slot 4.

(e) Install lever TP152298, pawl TP152653, latch TP154613, spring TP157240, spring TP90517, wick TP72522, spring TP4703, and disabling clip TP157274 in slot 4.

(f) Remount stunt box.

Modify friction feed set the same as the sprocket feed set except install LF function bar TP192471 in slot 4. Replace the LINE FEED keytop with the NEW LINE keytop TP185227.

4.13 Secure the lower edge of the faceplate to the cabinet with the following hardware:

TP199309   Stud
TP198654   Locating Bracket
TP194819   Spring Clip
TP7002      Flat Washer
TP119649   Retaining Ring

4.14 Secure the TP301664 plate over the hole in the cabinet reserved for the speaker with two TP194776 screws.
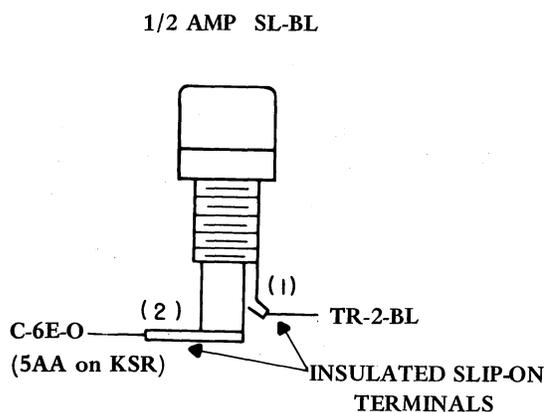
4.15    Remove and discard the TP199353 SPKR-VOL control plate and replace it with the blank TP199359 plate.

B.    TP340011 Modification Kit

4.16    The TP340011 modification kit provides the necessary conversion of a 35 set, with a TP336474 modification kit and UCC29 to allow operation with a TP186670 modification kit for point-to-point private line service.

4.17    Route cable assembly TP340012 along side cable assembly TP336497 between the ESU cable connectors and the UCC29 connectors in the lower compartment of the cabinet. Insert the connector terminals into the connectors on the ESU end per Figure 9 — W-BK (female) in connector W(7) pin 13, BR-BL (male) in connector X(6) pin 9, and BK-Y (female) in connector V(8) pin 7. On RO sets, tape and tie back the BK-Y wire instead of inserting it in connector V(8) pin 7. Poke male terminals on other end of TP340012 cable into CAB connector (3) mating with UCC29 — BK-Y in pin 6, BR-BL in pin 13, and W-BK in pin 15 per Figure 10.



35T ESU PER 8142WD OR
35A ESU PER 5821WD,
35C ESU PER 5823WD,
(Connectors 6, 7, 8 Only)

ACTUAL WIRING OF TP336497 AND TP340012 CABLE

# Indicates TP340012 Cable
* Indicates 18 AWG

Figure 9 - ESU Cable Connectors

CZ
TERMINAL STRIP

CAA
4

V-4-Y-G
Z-10-R
W-4-P
W-3-O — Z-1-S
W-2-R-G
Z-8-Y — V-5-R-Y
X-2-BL
W-8-G* — W-7-W*

BK (Moved From 6)
S (Moved From 6)

DISCARD METAL JUMPER

CV-3-BK (Moved From 8)

TP185718 DIODE ASSEMBLY
# V-7-BK-Y

CAB
3

W-13-W-BK #
X-9-BR-BL #

X-5-W-O

V-14-W-G
V-8-W-Y

CAG
5

V-6-R-BL — CAF-12-S
W-1-W-R
TP195614 KEYPIN (2 Places)

CAD
8

X-12-W-P
V-9-W-R-S
X-11-W-BK-P — V-3-W-S
X-1-W-BL

CAE
7

V-2-BR
V-1-BK

CN

(1) A

BR-G

CAA-7-S ON UCC29 (Solder Connection Necessary on ASR Only)

BREAK DETECTOR CARD CONNECTOR

CAF
6

X-7-W-O-G — Z-11-W-BR
CAG-8-S — W-6-Y*
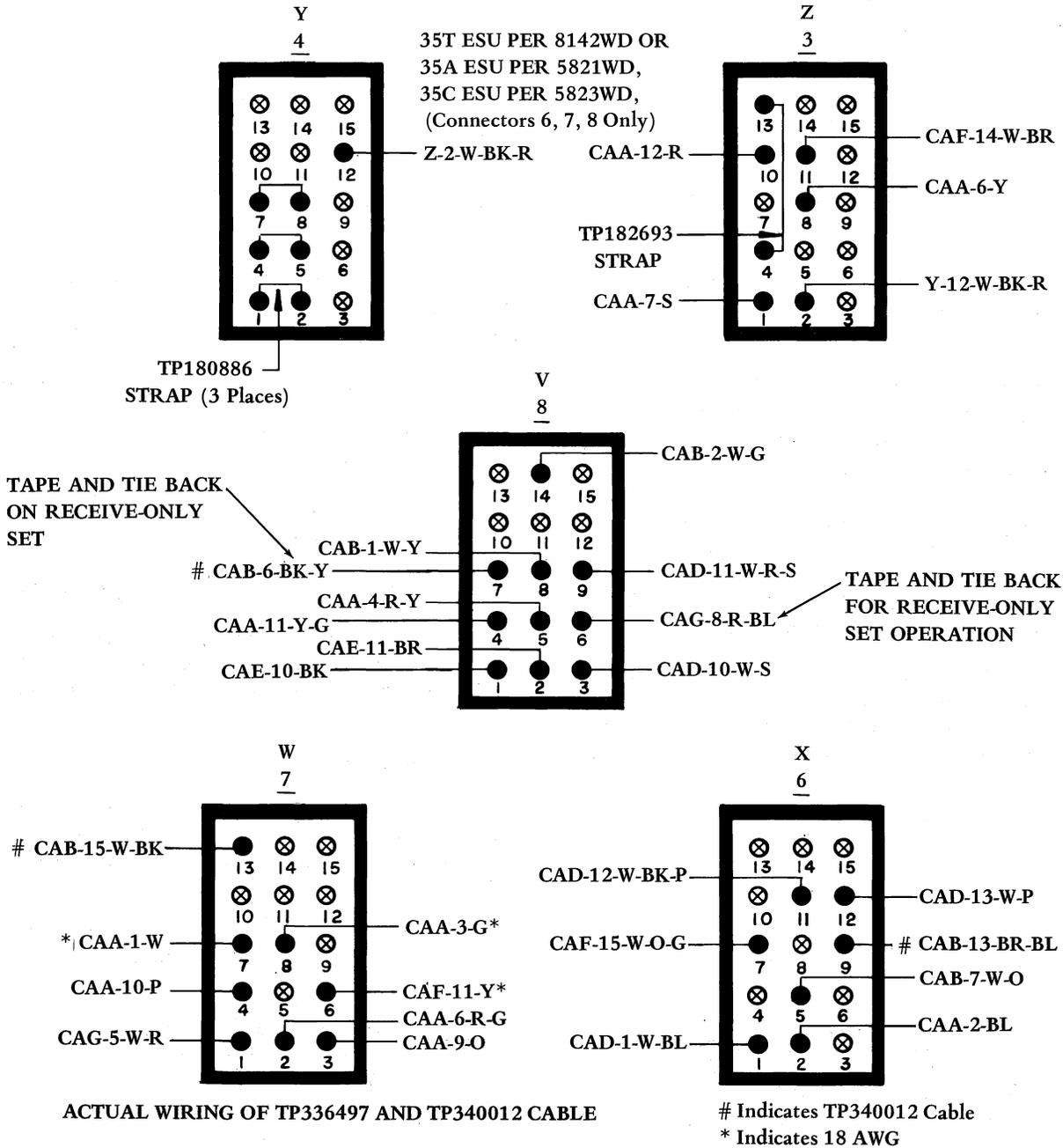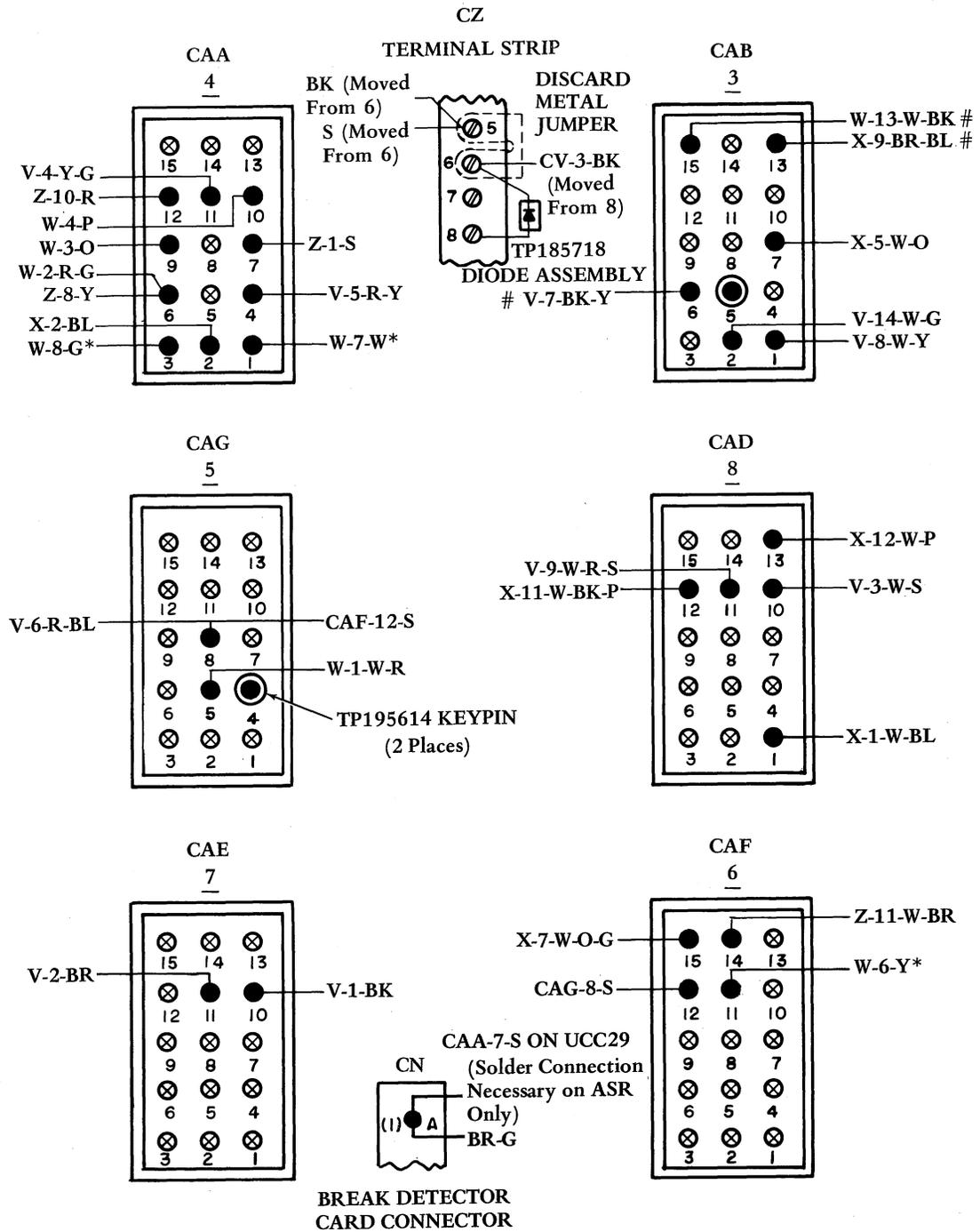
# Indicates TP340012 Cable
* Indicates 18 AWG

ACTUAL WIRING OF TP336497 AND TP340012 CABLE

Figure 10 - UCC29 Cable Connectors

C. 35T ESU (ASR)

4.18    Stow W-G-BK wire from "C" wiring field from terminal 5-M. Move wire W-R-S (moved by modification kit TP336474 from C-7E to C-3P) from C-3P to C-7L. Cut string ties if necessary (Figure 11). The following wires are moved to give control of the reperforator from DC-2 (tape on) and DC-4 (tape off) codes on line:

>       Y from C-5H to C-4T
>       BL from C-5H to C-1J
>       R-S from C-1G to C-2T

Stow the following wires:

>       BR-BL from C-10A
>       R-BL from C-4T
>       BK from C-9C

Add TP198831 straps between the following terminals:

>       C-1J and C-10A
>       C-5H and C-9C
>       C-5H and C-4T

4.19    With ESU upside down, remove and discard the following green wires (Figure 12):

>       NCT-2U to NCT-6
>       NCT-2L to NCT-6M

Add the following TP113441 BK straps:

>       TDC-4 to TDC-4B
>       NCT-2 to NCT-2B
>       NCT-2L to NCT-2U

Solder diode TP181654 to TDC-1L (cathode end) and other end at MSP-11. Slip TP181893 sleeves on resistor and diode leads before soldering resistor (2.2K) TP129852 to MSP-11 and TDC-2L (Figure 12). Move wire originating at MSK-6 from C-7P to C-4L. Remove 1000 ohm resistor R-10 between T3-1 and T3-2 (Figure 13).

4.20    Move the following wires to give control of the reperforator from DC2 (tape on) and DC4 (tape off) codes on line (Figures 12 and 13):

>       Wire from C-4T move NCT-4M to NCT-6B
>       Wire from C-2T move TDC-3M to NCT-6
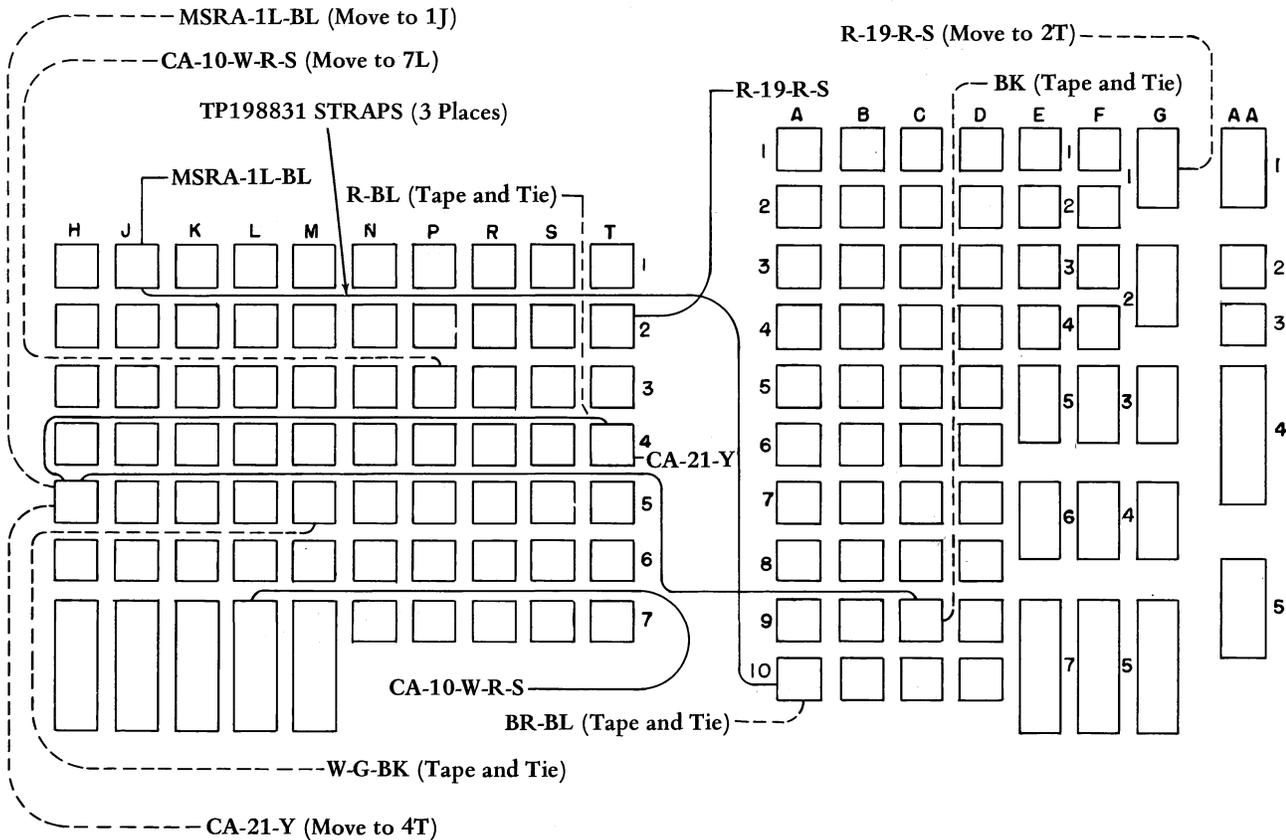>       (This wire may have to be rerouted or lengthened.)



Figure 11 - 35T ESU Wiring Field

Note: Actual wiring to provide automatic operation of reader and keyboard mounted reperforator on ASR sets (refer to 8142WD for 35T ESU). Remove broken line circuitry. Add solid line circuitry.
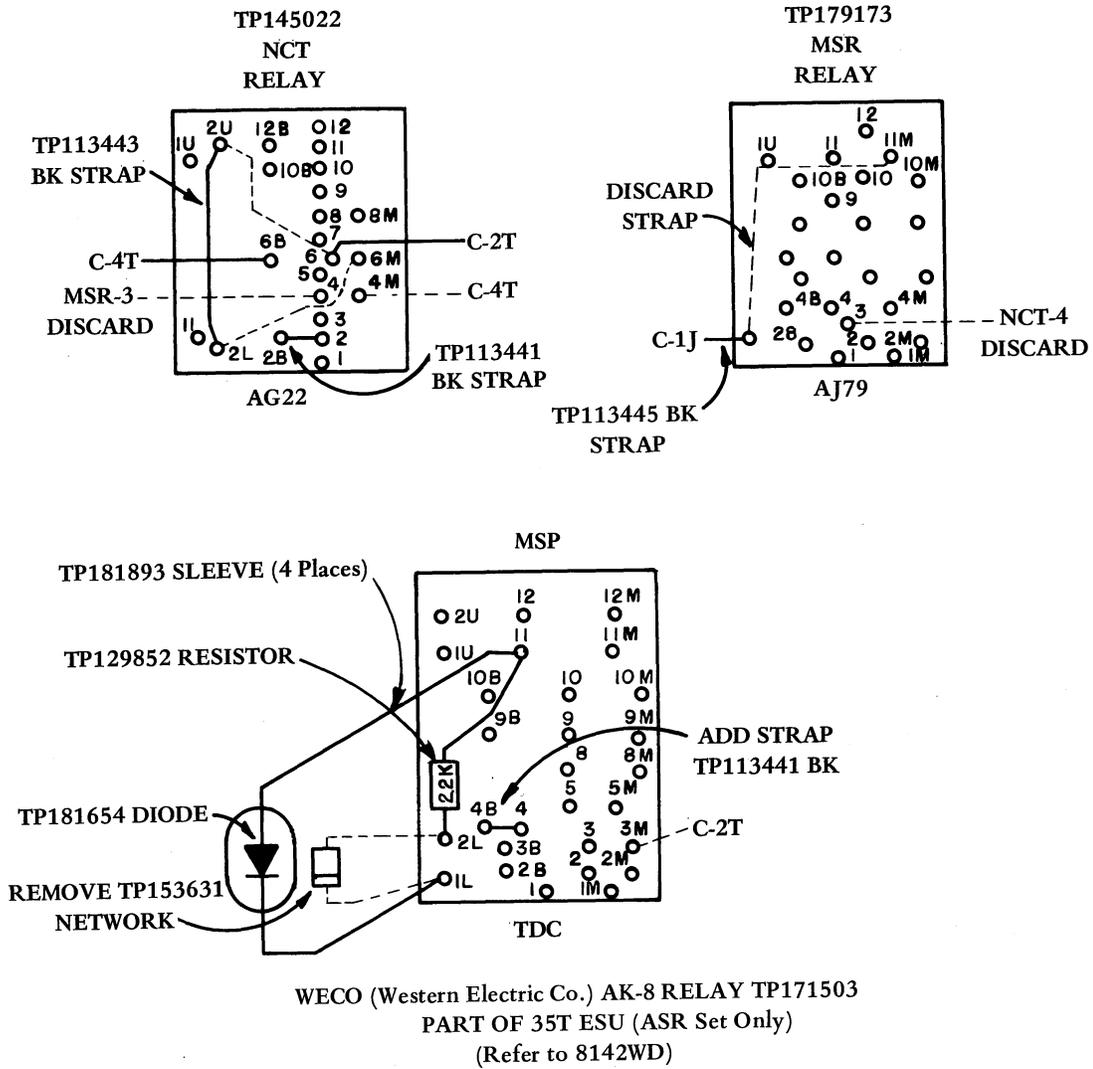


Figure 12 - 35T ESU Relay Wiring

"C"
NCT WIRING FIELD
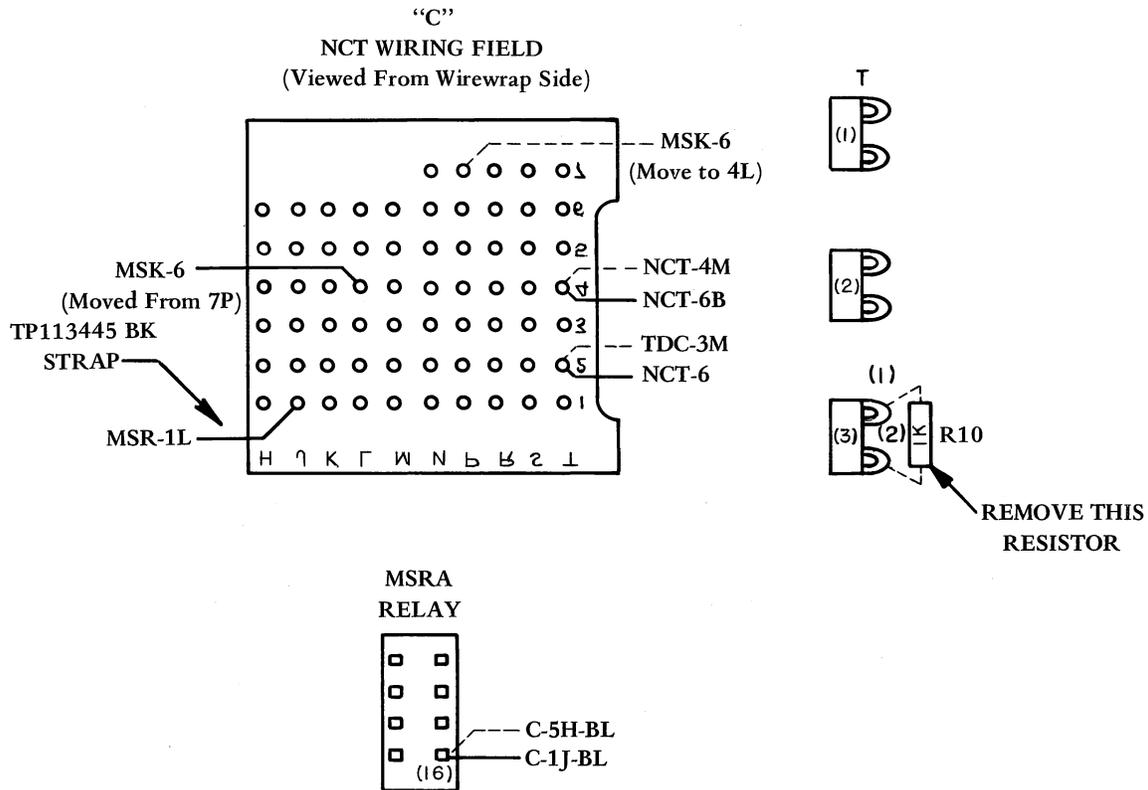(Viewed From Wirewrap Side)

Figure 13 - 35T ESU Wiring Field

D. Keyboard Mounted Reperforator

4.21    To operate the keyboard mounted reperforator automatically it is necessary to rewire relay MSR as shown in Figures 14 and 15. The reperforator will then automatically operate from on-line characters DC2 (tape on) when received only and DC4 (tape off) either transmitted or received. Remove and discard the following wires (Figure 12):

MSR-1L to MSR-11M
MSR-3 to NCT-4

Add TP113441 BK straps between MSR-1L and C-1J. 35C ESU (KSR) and 35C ESU (RO) require no wiring changes.

E. LP Printer

4.22    Rewire stunt box AVA of 35K and AUZ of 35L typing unit and add two diodes per Figure 16. On 35K typing unit AVA (friction feed), remove strap between center terminals of slots 19 and 20. Remove W-BR wire from rear terminal slot 19 and solder it on center terminal slot 17.

4.23    Add strap TP113443 BK from center terminal slot 17 to center terminal slot 29. Untape spare wires and connect W-G to slot 19 rear, and W-O to slot 20 center (Figure 16).

4.24    On 35L typing unit (sprocket feed), remove strap between center terminals of slots 18 and 19. Move BL wire from slot 15 center to slot 14 center. Move Y-G from slot 15 rear to slot 14 rear. Move W-BR from slot 18 rear to slot 20 center (Figure 16).

4.25    Untape spare wires and connect W-G to slot 18 rear, and W-O to slot 19 center. Add strap TP113443 BK from slot 20 center to slot 29 center (Figure 16).

4.26    On both 35K and 35L typing units, connect one TP197464 diode between slot 32 center and slot 29 rear, connect the other diode (TP197464) between slot 30 rear and slot 29 rear (both cathodes connected to 29 rear). Use a TP181893 sleeve on the cathode lead of the first diode. Connect BK-O spare wire to slot 32 center.

INSTALL BROKEN LINE CIRCUIT
PATHS CALLED FOR BY THIS KIT

SOLID LINE PATHS ARE
EXISTING WIRING

—///— INDICATES PATH
DISCONNECTED BY THIS KIT

STUNT BOX CONTROLS MSR
RELAY WHICH PUTS REPER-
FORATOR ON LINE WHEN
OPERATED

Figure 14 - Rewiring Schematic for MSR
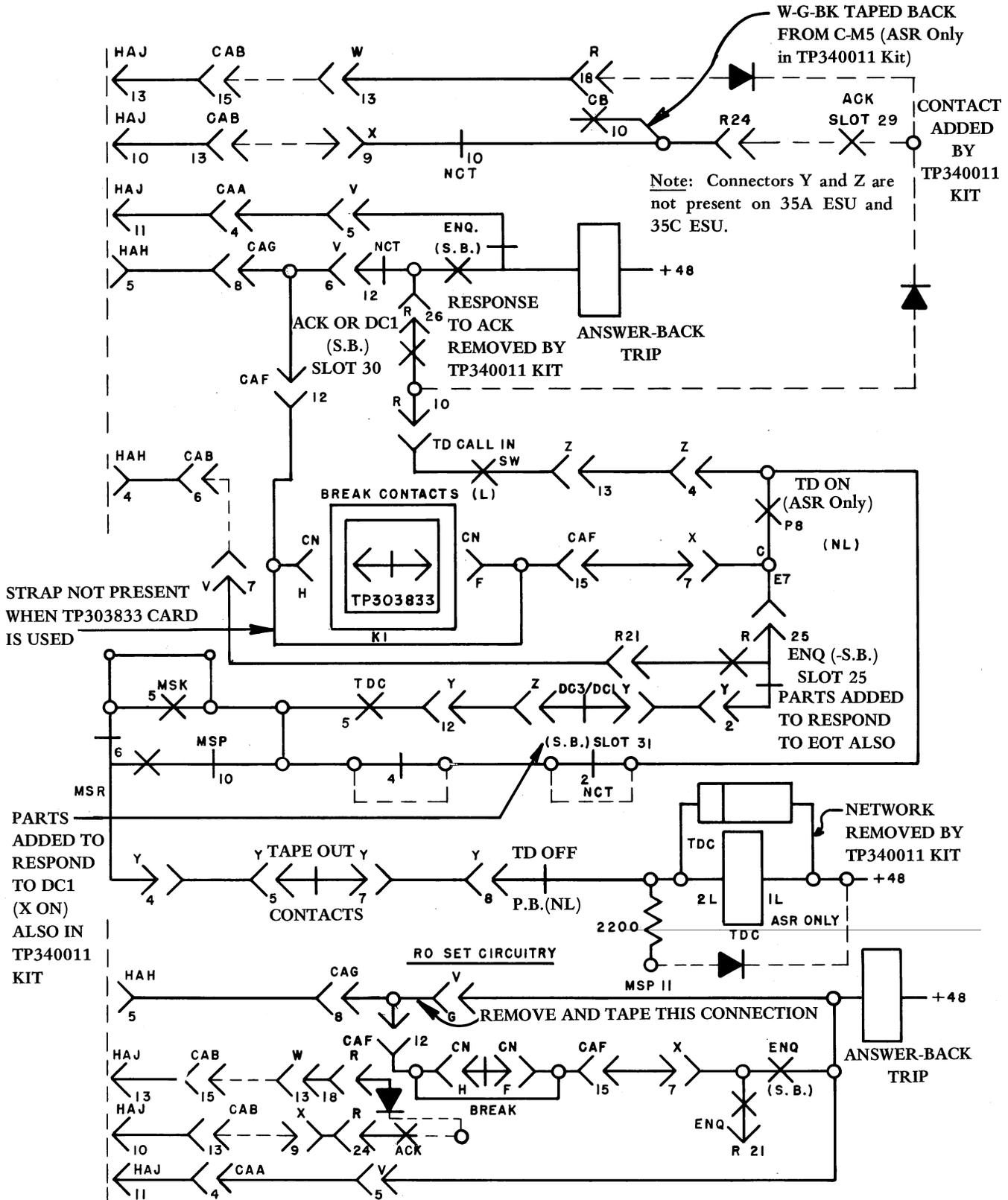
Figure 15 - ASR and KSR Set Circuitry

Note: Remove broken line circuitry. Add solid line circuitry.

W
STUNT BOX CONTACTS

PART OF BOTH 35L (Refer to 8192WD)
AND 35K (Refer to 8139WD)

FRICTION FEED
35K ONLY

SPROCKET FEED
35L ONLY

SLOT POSITION IN STUNT BOX

REMOVE STRAP

17 18 19 20

REMOVE STRAP

14 15 16 17 18 19 20

25 26 27 28 29 30 31 32

FRONT

ADD STRAP

CENTER

TP 113443 BK

REAR

INSERT TP157887
CONTACT ARM AND
TP172591 CONTACT
ARM SPRING IN
SLOT 29.

TP197464
DIODES (2)
TP181893
SLEEVE

R-18-BK-O
(Untaped From Spares)

R-24-W-BR
(Moved From
Slot 19)

R-19-W-G
(Untaped
From
Spares)

R-3-BL
(Moved
From
Slot 15)

R-27-W-O
(Untaped
From
Spares)

MOVE CONTACT ARM
AND SPRING FROM
SLOT 15 TO SLOT 14.

R-24-W-BR
(Move to
Slot 17)

R-24-W-BR
(Move to
Slot 20)

R-27-W-O
(Untaped
From
Spares)

R-3-BL
(Move to
Slot 14)

S-1-Y-G
(Move to
Slot 14)

S-1-Y-G
(Moved
From
Slot 15)

R-27-W-O
(Untaped
From
Spares)
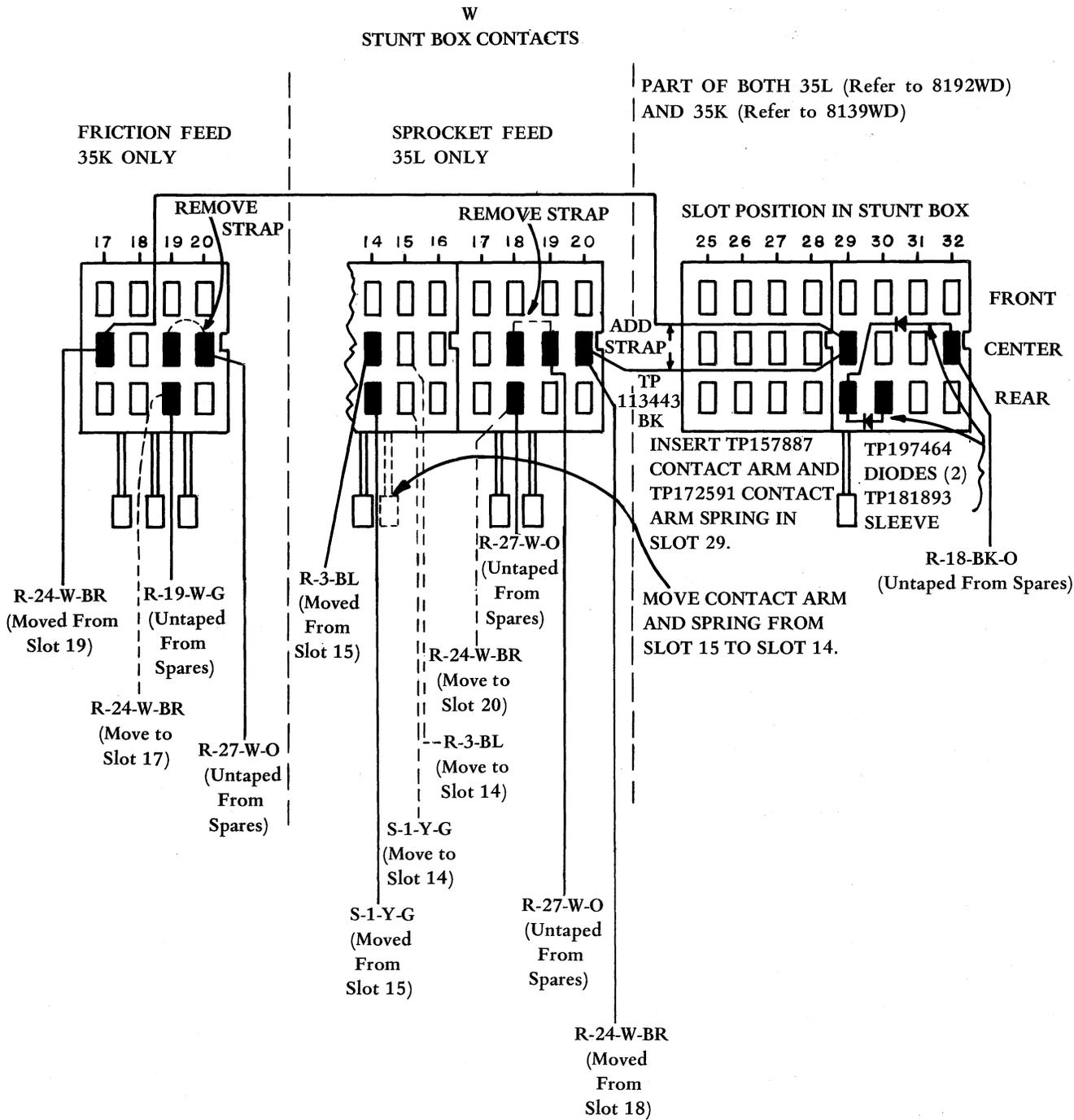
R-24-W-BR
(Moved
From
Slot 18)

Figure 16 - Typing Unit Wiring

4.27    Replace the TP153604 function pawl (slot 29) in 35K and 35L typing units with the TP152653 pawl from slot 31. Add TP152660 spring plate, TP152642 lever, and TP90517 spring in slot 29. Replace TP153598 pawl in slot 30 with the TP153604 pawl from slot 29. Replace TP152653 function pawl in slot 31 with TP153598 pawl from slot 30.
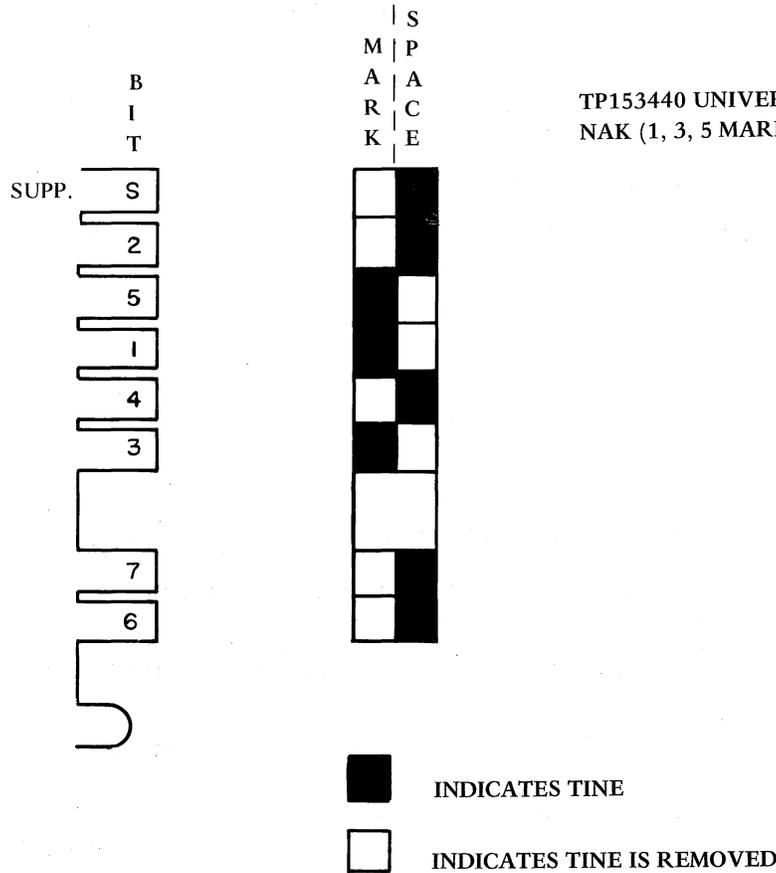
4.28    Interchange TP192469 function bar X ON (DC1) in slot 29 with TP192468 function bar RU (ACK) in slot 30. Insert TP157887 contact arm and TP172591 contact arm spring over slot 29 (Table E).

4.29    On stunt box AVA of 35K typing unit, add the following parts in slot 17: TP153440 universal function bar coded for NAK (control U, 1, 3, and 5 marking), refer to encoding chart in Figure 17. Add TP4703 spring, TP153604 pawl, TP157240 spring, and TP72522 wick. Replace the TP152653 pawl in slot 18 with TP153598 pawl.

4.30    On stunt box AUZ of 35L typing unit, move the parts in slots 14 and 15 to slots 13 and 14 respectively. Move contact arm and spring from slot 15 to 14

## TABLE E

### STUNT BOX MODIFICATION

| SLOT | OPERATION | LATCH OR SPRING PLATE | FUNCTION LEVER | LEVER SPRING TP90517 | FUNCTION BAR | BAR SPRING TP4703 | FUNCTION PAWL | PAWL SPRING TP157240 WICK TP72522 |
|---|---|---|---|---|---|---|---|---|
| **TYPING UNITS 35K AND 35L** | | | | | | | | |
| 29 | Remove and retain | | | X | TP192469 | | TP153604 | |
| 29 | Install | TP152660 | TP152642 | | TP192468 from 30 | | TP152653 from 31 | |
| 30 | Remove and retain | | | | TP192468 | | TP153598 | |
| 30 | Install | | | | TP192469 from 29 | | TP153604 from 29 | |
| 31 | Remove and retain | | | | | | TP152653 | |
| 31 | Install | | | | | | TP153598 from 30 | |
| **FRICTION FEED 35K ONLY** | | | | | | | | |
| 17 | Install | | | | TP153440 code for NAK | X | TP153604 | X |
| 18 | Discard | | | | | | TP152653 | |
| 18 | Install | | | | | | TP153598 | |
| **SPROCKET FEED 35L ONLY** | | | | | | | | |
| 13 | Install | | | | TP192475 from 14 | X from 14 | TP153604 from 14 | X from 14 |
| 14 | Remove and retain | | | | TP192475 | X | TP153604 | X |
| 14 | Install | TP152660 from 15 | TP152642 from 15 | X from 15 | TP192473 from 15 | X from 15 | TP153598 from 15 | X from 15 |
| 15 | Remove and retain | TP152660 | TP152642 | X | TP192473 | X | TP153598 | X |
| 15 | Install | | | | TP153440 code for NAK | X | TP153604 | X |
| 16 | Discard | | | | | | TP152653 | |
| 16 | Install | | | | | | TP153598 | |

```
              |S
           M  |P
           A  |A
        B  R  |C
        I  K  |E
        T
SUPP.   S
        2
        5
        I
        4
        3

        7
        6
```

TP153440 UNIVERSAL FUNCTION BAR CODED FOR
NAK (1, 3, 5 MARKING – CONTROL U)

■  INDICATES TINE

□  INDICATES TINE IS REMOVED

Figure 17 - Function Bar Encoding

(Figure 16). Install the parts used in slot 17 of stunt box AVA in 35K typing unit, slot 15. Replace pawl TP152653 in slot 16 with TP153598.

F.  Call Control Unit (UCC29)

4.31    Replace 8/10 ampere fuse and associated label with fuse TP143306 (1.0 ampere SL-BL) and label TP185834. If modification kit TP336474 has not been installed on set to be modified, installation of diode assembly on terminal strip may be omitted.

G.  Keyboard (LAK and LK)

4.32    Replace keytops E-WRU, RUBOUT, and F with TP185283, TP185284, and TP185366 keytops respectively.

H.  Private Line Modification Kit (TP186670)

4.33    On the RO set only, remove the lamp from the green PROCEED light socket. Install the set logic assembly using the lower pair of holes in the TP336462 bracket to mount the TP336465 lamp bracket in 35 type cabinets. Use TP181243 screws supplied with modification kit TP340011 to mount the TP336462 bracket to the TP336459 spacer plate. If 108-type data set is used, replace the SPARE label with TEST label TP336632 (Figure 18).

I.  TP186670 Modification Kit Installation

4.34    Modification kit TP186670 mounts in front of call control unit UCC29 and is housed under the teletypewriter cover.
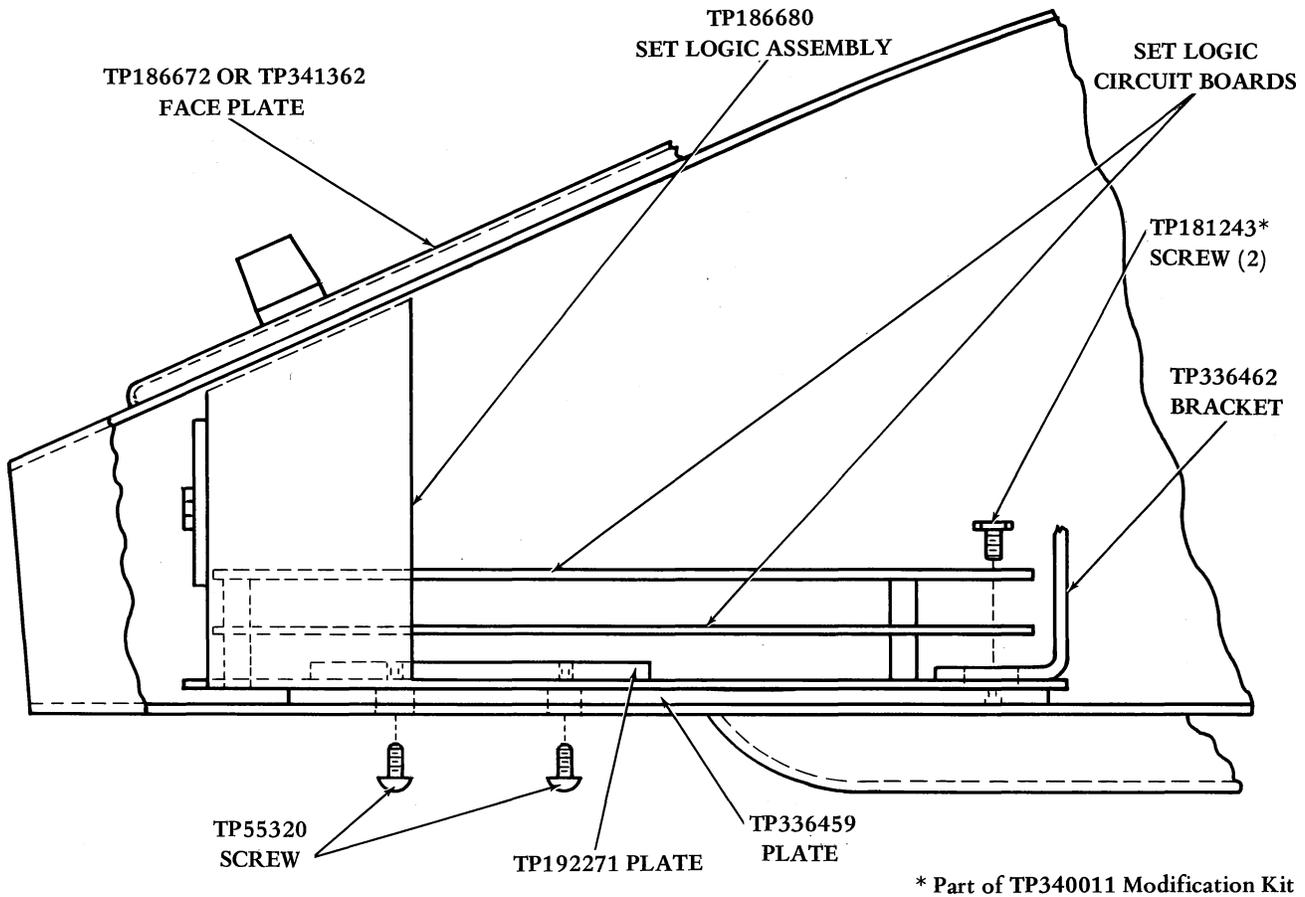
TP186680
SET LOGIC ASSEMBLY

SET LOGIC
CIRCUIT BOARDS

TP186672 OR TP341362
FACE PLATE

TP181243*
SCREW (2)

TP336462
BRACKET

TP55320
SCREW

TP192271 PLATE

TP336459
PLATE

TP340011 Modification Kit

* Part of TP340011 Modification Kit

Figure 18 - Logic Mounting in 35 Units

**Preparation**

4.35    Verify strapped options for features selected by customer for station operation in 4.36.

(1)    Remove nameplate from front of teletypewriter.

(2)    Remove screws holding teletypewriter cover to base (front and rear). On ASR sets remove setscrew from rear cover of tape reader.

(3)    Unthread and remove any paper or paper tape from teletypewriter.

(4)    Remove platen knob.

(5)    Lift and remove cover from teletypewriter.

**Options**

4.36    Circuit card assemblies TP303831 and TP303832 contain four factory-wired options for modification kit TP186670. See Table A for option and corresponding strap, circuit card, and wiring diagram location.

**Card Connector TP181819 Modification**

4.37    The following procedures refer to Figure 1.

(1)    Remove two screws TP181241 from UCC29 bracket.

(2)    Move card connector TP181819, with its bracket, forward until it clears the UCC29 bracket. Cut yellow wire between pins F and H from card connector.

(3)    Return card connector, with its bracket, to original position. Replace screws removed in step (1).

(4)    Install break detector circuit card TP303833 in card connector.

**Lamp Assembly TP186690**

4.38    The following procedures refer to Figure 2.

(1)    Mount lamp assembly bracket TP336462 vertically against UCC29 power supply.

(2) Fasten lamp assembly bracket to UCC29 baseplate with two flat washers TP7002, two lockwashers TP2191, and two hex posts TP336461.

(3) Position lamp assembly bracket until hex posts are at center of mounting slots. Leave hex posts loose enough to adjust lamp assembly bracket.

(4) Loosen four screws TP181241 friction tight without changing position of lamp assembly bracket.

(5) Put teletypewriter cover in place. Set the faceplate (TP186672 or TP341362) over call control unit UCC29. Adjust forward-backward position of lamp assembly bracket until "floating" faceplate is approximately centered.

(6) Remove faceplate. Adjust lamp assembly bracket vertically until bottom edge of lens are just below outer edge of teletypewriter cover.

(7) Remove teletypewriter cover. Without changing any adjustment, tighten screws and hex posts.

Logic Package TP186680 Installation

4.39    The following procedures pertain to installation of logic package TP186680 (Figures 2 and 3).

(1) Install hex post TP336493 and lockwasher TP2191 at front and center of UCC29 (Figure 2).

(2) Place logic package on hex posts. Install three screws TP181241 friction tight to allow positioning of logic package.

(3) Set faceplate (TP186672 or TP341362) over logic package with indicator lenses of key assembly TP186683 protruding through their respective positions. Slide logic package as far forward as free motion of "floating" faceplate will permit. Without disturbing adjustment, remove faceplate.

(4) Note gap at rear edge of logic package mounting bracket. Slide logic package toward rear until gap is reduced to half. Tighten three screws TP181241.

(5) Loosen two screws TP181241 fastened to key bracket TP186681 (Figure 3). Place key bracket to lowest position. Replace teletypewriter cover.

(6) Raise key bracket until it is just short of touching cover. Key assembly TP186683 and its plastic collar TP336334 should protrude through cutout in cover.

(7) Without disturbing key bracket TP186681, remove teletypewriter cover. Tighten screws loosened in step (5).

Cables

4.40    Following are procedures for routing and connecting cables.

(1) Plug connector on end of 3-wire cable assembly TP186677 into lamp bracket cable assembly TP186689.

(2) Remove UCC29 mounting screw adjacent to selector magnet driver card connector.

(3) Route EIA interface cable TP186671 in trough between UCC29 and its base. Insert mounting screw through wire loop on strain relief. Lay cable between mounting screw and UCC29. Tighten screw.

(4) Plug EIA interface cable TP186671 into 6-pin connector TP182650 on circuit card TP303831.

(5) Mate connectors 1 and 2 of cable TP336464 to connectors 1 and 2 on UCC29. Dress cable in trough between UCC29 and its base. Mate connectors on other end of cable TP336464 to corresponding connectors on circuit card TP303831.

(6) Perform checkout procedures given in 5.32 through 5.50.

J.    Data Sets

108- and 109-Type

4.41    After the modification kit strapped options have been selected for removal or retention, install data set and circuit pack AR17 in DAS 820D-L1A. For related information of data sets 108- and 109-types, see Section 591-023-201 and 591-024-201 respectively.

4.42    Remove pedestal panel by depressing two spring loaded latches at top of panel.

4.43    Assemble the 96A brackets to the 180A backboard using four TP143442 screws, TP2669 lockwashers, and TP112626 nuts.

4.44    Mount the backboard and bracket assembly to the relay rack in the set cabinet. Secure with four TP153442 screws, TP2669 lockwashers, and TP3538 flat washers (Figure 19).

4.45    Mount the 820D-L1A Data Auxiliary Set to the 180A backboard securing it with the two clamps on each side of the backboard (Figure 19).

(Rear View)

LOCAL
TEST KEY

TOP
RELAY
RACK

820D
DATA
AUXILIARY
SET

180A
BACKBOARD

AC POWER CABLE

96A
BRACKET

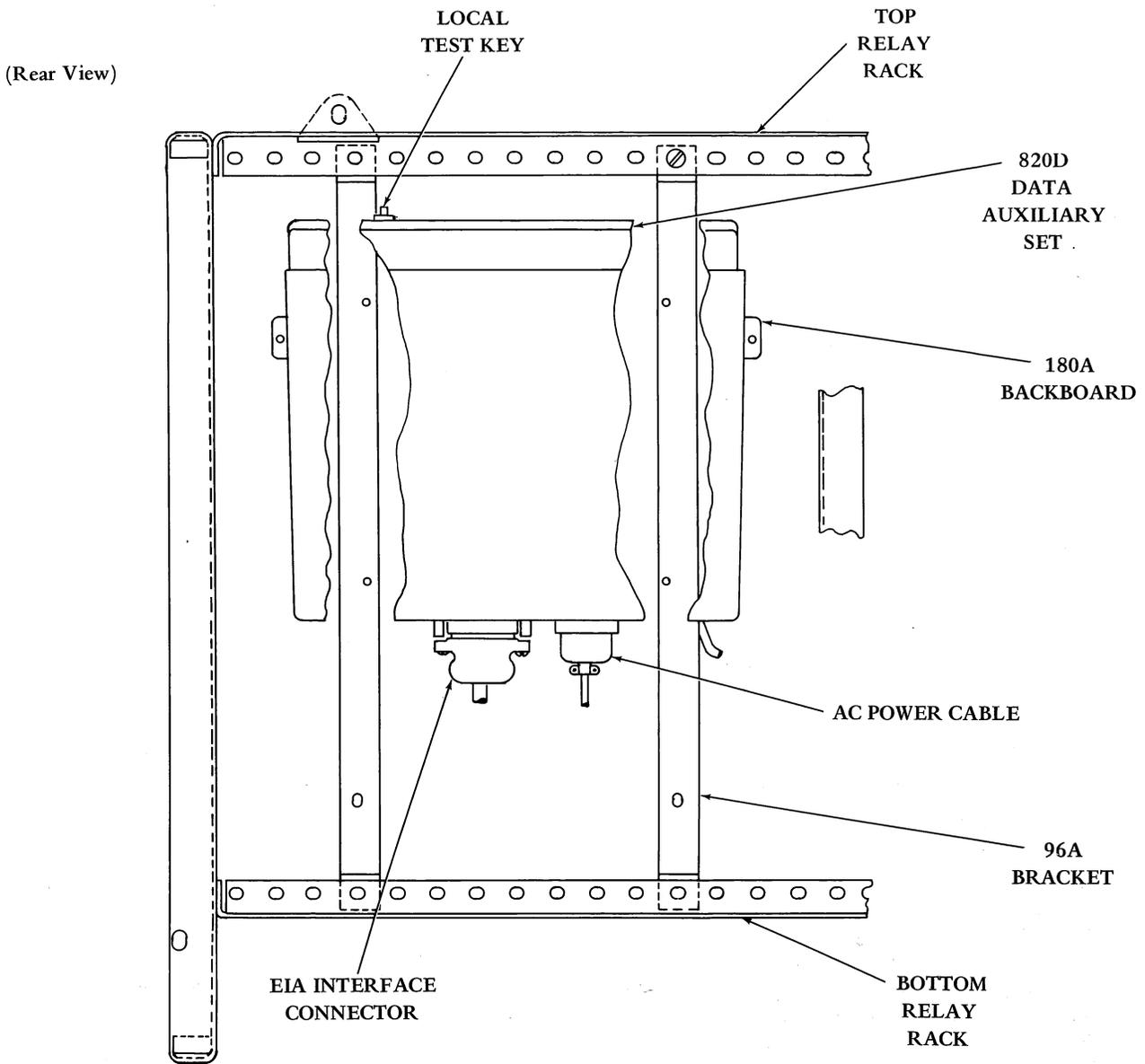EIA INTERFACE
CONNECTOR

BOTTOM
RELAY
RACK

Figure 19 - Mounting of DAS 820D-L1A on M35

4.46    Remove the ac power cable knock-out plate from the lower right end of the cabinet. Remove the two sections of the left knock-out. Run the M3AY cable through the opening. Reinstall the plate.

4.47    Make all wiring and cable connections between DAS 820D-L1A and the 35 teletypewriter.

CAUTION: DISCONNECT POWER FROM TELE-TYPEWRITER.

Connect end of data auxiliary set power cable M3AY to terminal strip at right rear of teletypewriter as follows:

   (a)   Green wire to terminal 1
   (b)   White wire to terminal 2
   (c)   Black wire to terminal 4

Replace teletypewriter cover by reversing procedures in 3.01. Connect other end of data set power cord M3AY to DAS 820D-L1A.

Connect interface cable TP186671 to connector J3 of DAS 820D-L1A.

1A Data Station Single Channel Arrangement

4.48 The 1A data station is contained in a 31A2 data mounting and is mounted into a 33 or 35 teletypewriter with brackets 100A and 101A respectively (Figure 20). The mounting brackets each contain hardware and a fixed mounting stud that is part of the bracket. For additional information concerning the 1A data station, refer to Section 591-813-201.

4.49 Secure 31A2 data mounting to bracket 101A and mount to relay rack provided in cabinet 35A or 35B.

4.50 Connection of a 1A data station to a 4-wire line or a 2-wire line facility is made on screw terminals at TS(A) on 31A2 data mounting (Tables B and C). Connection to an externally mounted test key and lamp (TEST and CF) is also made on screw terminals at TS(A) on 31A2 data mounting (Table D). Connection of the 1A data station to the teletypewriter is made through cable TP336601, and receptacle J5 on 31A2 data mounting.

4.51 For a 4-wire facility, connect wires of D4BD-49 cable to TS(A) on 31A2 data mounting as shown in Table B.

4.52 For a 2-wire facility, connect wires of D4BD-49 cable to TS(A) on 31A2 data mounting as shown in Table C.

4.53 To interconnect the 1A data station with the Voice Band Loop Around (VBLA) test key and lamp (TEST and CF) on the teletypewriter, connect wires of D6AD-61 cable to TS(A) on 31A2 data mounting as shown in Table D.

5. CHECKOUT PROCEDURES

A. 33 Stations (Off-Line)

5.01 The following procedures apply to 33 ASR and RO terminals equipped with modification kit TP186670.

5.02 Connect teletypewriter ac connector to an ac power outlet.

5.03 Operate LOCAL key. The key should remain operated (depressed) and illuminated; the teletypewriter motor should start, the typing unit should run closed, and the elapsed time indicator should operate.

5.04 Operate all character, function, and control keys. The typing unit should print proper characters and perform proper functions. If the new-line feature is enabled, the typing unit should line feed and carriage return when NEW LINE keytop is operated. On sprocket feed sets, simultaneously operate CTRL and L keys. Typing unit should form feed properly and return the carriage.

5.05 Operate RETURN and NEW LINE keys. Operate 1 through 0 keys seven times, then operate keys 1, 2, and 3. If number 3 overprints number 2, the typing unit has correctly printed 72 characters per line with a bell indication at about the 60th character.

5.06 On ASR sets, operate tape punch ON pushbutton. Operate various characters and function keys. The typing unit should print all characters except function characters while the tape punch should punch all characters and functions.
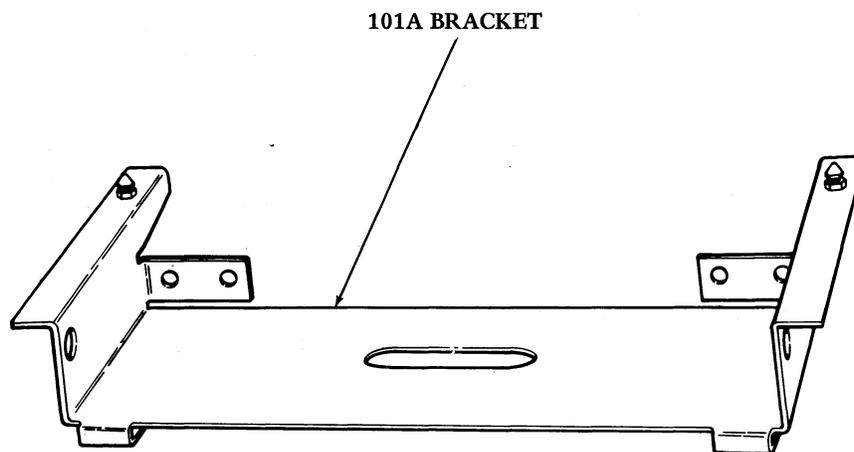
101A BRACKET



Figure 20 - Mounting Bracket

5.07    Check punched code combinations for correct transmission of even parity bits.

5.08    Operate B. SP. pushbutton several times. Tape should backspace each time pushbutton is operated.

5.09    Operate DELETE key several times. Operate REL. tape punch pushbutton and pull tape forward. Check tape for correct overpunching; make certain holes are not elongated. Operate OFF pushbutton.

5.10    Remove tape from punch and place in reader. Move control lever on reader to MANUAL START. Reader should operate and transmit message to typing unit.

5.11    Move tape reader control lever to MANUAL STOP, then to MANUAL START. Reader should stop and start without transmitting errors.

5.12    While tape reader is operating, open tape lid. Reader should stop. Close tape lid and move control lever to MANUAL START. Move control lever to FREE. Tape should move freely when pulled.

5.13    Move control lever to MANUAL START. Allow tape to run. Hold back end of tape as it feeds into reader. When tape becomes taut, reader should stop. Release tape and allow reader to process remaining tape. Reader should stop when tape runs out.

5.14    For stations equipped with ASR and KSR teletypewriters, operate HERE IS keytop. The station answer-back should operate and print its answer-back sequence. Simultaneously operate CTRL and ENQ keys. The answer-back should not operate.

5.15    Operate BREAK keytop. Typing unit should run closed.

5.16    Operate OFF key. LOCAL key should release and its lamps go out. The teletypewriter motor should stop.

On-Line

5.17    The following procedures are for stations equipped with data sets 108- or 109-type.

Data Carrier Detector

5.18    A status check of the data carrier detector (CF) circuit is given in Table F.

5.19    The following test equipment is required:

(a)    Data test set 901B

(b)    Station test set TTS-28, or equivalent.

TABLE F

DATA CARRIER DETECTOR (CF) STATUS

| CARRIER BEING RECEIVED | CARRIER NOT BEING RECEIVED |
|---|---|
| Lamp or buzzer — Off | Lamp or buzzer — On |
| CF lead — On (+5 to +25 v) EIA interface | CF lead — Off (-5 to -25 v) EIA interface |

Note: The lamp or buzzer must be located at the terminal equipment. Also, the carrier squelch on the carrier fail option must be removed.

5.20    The following procedure should be used to perform the CF lead indication test on sets utilizing an EIA interface.

(1)    At the DAS 820D-type, remove the interface cord from J3.

(2)    Interconnect DAS 820D-type and 901B data test set cover (interface test adapter) using W25A cord supplied with interface test adapter.

(3)    Set FUNCTION switch on TTS-28 to 30 v dc.

(4)    Connect + (positive) lead of TTS-28 to terminal 8 (CF) of the interface test adapter.

(5)    Connect - (negative) lead of TTS-28 to terminal 7 (AB) of the interface test adapter.

(6)    Meter should indicate between 5 and 25 volts, indicating that data carrier lead is on and that carrier is being received.

(7)    Remove leads from terminals 8 and 7 of interface test adapter. Remove W25A cord from DAS 820D-type, and reconnect power cable to J3.

Carrier Monitoring Test

5.21    This test determines the presence of both near- and far-end carriers.

5.22    The only equipment required at the station is a 1011-type handset (dial hand test set), equipped with test clips.

5.23    The following procedure should be used to deter-
mine the presence of far-end carrier at the station.
This test assumes the carrier squelch on carrier fail option has
been removed.

(1)  Remove power from DAS 820D-type.

Note:  This will disable near-end carrier and allow
monitoring of weak far-end carrier.

(2)  Operate 1011 handset TALK MON switch to
MON.

(3)  Connect leads of 1011 handset to terminals 1 and
2 of terminal strip TB1 of DAS 820D-type.

(4)  Monitor for incoming carrier (F1 or F2).

(5)  Remove 1011 handset, and restore power to the
DAS.

5.24    The following procedure should be used to deter-
mine the presence of near-end carrier.

(1)  Operate 1011 handset TALK MON switch to
MON.

(2)  Connect leads of 1011 handset to terminals 1 and
2 on TB1 of DAS 820D-type.

(3)  Monitor for carrier (F1 or F2) opposite far-end
carrier.

Note:  Near-end carrier will be the louder tone of
two tones heard.

(4)  Remove 1011 handset.

Loop-Back Test

5.25    The loop-back test is required when investigating
trouble reports or at the time of installation to
ensure proper operation of the data station. If the service
offering is a voiceband data circuit, the 904-type data test
center (DTC) will perform the test; if it is a telegraph
channel, the private line telegraph testboard will perform the
test.

5.26    Call the serving test center and request a test of
data sets 108- or 109- type.

5.27    The data station is conditioned for loop-back
testing by depressing the TEST key on the front of
the DAS or the remote TEST key when remote facilities are
installed. The DAS TEST key is a push-push type. It is
pressed once to condition the data station for testing and

pressed again to release the data station for test mode. The
TEST lamp lights when the data station is in the test mode.

Power Supply Measurement

5.28    The only equipment required at the station to
perform the power unit voltage test is a TTS-28
portable station test set, or equivalent, and a 901B data test
set.

5.29    The following procedure should be used to
measure the voltage of the 18A power unit.

(1)  At the DAS 820D-type, remove the customer
business machine cord from J3.

(2)  Connect the interface test adapter to J3 on the
DAS 820D-type.

(3)  Set FUNCTION switch on TTS-28 to 30 volts dc.

(4)  Connect - (negative) terminal of TTS-28 to inter-
face test adapter, terminal 7.

(5)  Connect + (positive) terminal of TTS-28 to inter-
face test adapter, terminal 9.

(6)  Meter should indicate 24 $\pm$3 volts.

(7)  Remove test lead that was connected in (5) from
terminal 9.

(8)  Exchange test lead from - terminal to + terminal on
TTS-28.

(9)  Connect - terminal of TTS-28 to interface test
adapter, terminal 10.

(10) Meter should indicate 24 $\pm$3 volts.

(11) Remove test leads, remove interface test adapter,
and reconnect customer business machine cord
disconnected in (1).

Trans-Hybrid Loss Measurement

Note:  This measurement requires that a 900-ohm
termination (quiet line) be placed on the line at either
the far end or the near end.

5.30    The following procedure should be used to
perform the trans-hybrid loss measurement test.

(1)  Request the 900-ohm termination to be placed on
the line.

(2) Check the send level of the data set by using TTS-28.

    (a) Set FUNCTION switch of TTS-28 to DBM BRDG 0 position.

    (b) Connect + and - terminals of TTS-28 to TP1 and TP2 of data set.

    (c) Read the meter and record reading.

(3) Set FUNCTION switch of TTS-28 to DBM BRDG -10 position.

(4) Connect + and - terminals of TTS-28 to a good ground and TP3 of data set, respectively.

(5) Meter indication should not be more positive than reading in (2) (c).

    Note: Meter actually reads at least a 10-dB difference due to the FUNCTION switch being set to -10.

**Loop Loss Measurement**

5.31    This measurement requires the use of the TTS-28 and an oscillator capable of furnishing 1000 Hz and 2300 Hz. The measurement is made as follows:

(1) Remove power from DAS 820D-type.

(2) Disconnect the telephone line from TB1 terminals 1 and 2.

(3) Set FUNCTION switch of TTS-28 to DBM 900Ω TERM 0 position.

(4) Connect + and - terminals of TTS-28 to the telephone line.

(5) Request distant station or STC to send 1000 Hz at 0 dBm.

(6) Read TTS-28 meter.

    Note: It may be necessary to set FUNCTION switch of TTS-28 to DBM 900Ω TERM -10 position to obtain reading.

(7) Request distant station or STC to send 2300 Hz at 0 dBm.

(8) Read TTS-28 meter.

(9) Meter readings are the actual measured loss (AML) of the telephone facilities. These readings should be the same as the readings taken during installation of the data station. The station layout card shows the expected measured loss (EML) when the facilities were designed. The readings taken in (6) and (8) should not deviate from the limits shown in Table G. If the AML is not within limits, the loop should be turned back for repair.

TABLE G

LOOP LIMITS

| TYPE OF LOOP | AML LIMITS |
|---|---|
| Without repeaters or carriers | EML ±1 dB |
| With E7 repeaters only | EML ±1 dB |
| With all other repeaters and/or carriers | EML ±2 dB |

    Note: The maximum AML possible for station-to-hub configurations should be -16 dB. The maximum AML for station-to-station configurations should be -24 dB.

(10) If AML is within limits, remove connections from TTS-28, replace cover, and restore power to the station.

**B. 35 Stations**

5.32    The following procedures apply to 35 KSR and ASR sets equipped with set logic assembly TP186680.

5.33    Connect station plug to ac power source.

5.34    On set logic assembly TP186680, depress LOCAL key. The copy lamp on teletypewriter set should light, the T lamp should light, the motor should start. Depress K button; its lamp should light, and the T lamp should extinguish. Operate all characters and functions on keyboard. The typing unit should print the proper characters and perform the proper functions. Check form out, horizontal tab, and vertical tab on sets so equipped.

5.35    Depress RETURN and NEW LINE keytops. Depress 1 through 0 keytops seven times, then depress keytops 1, 2, and 3. The number 3 should overprint 2 indicating that there are 72 characters per line.

5.36    Check that character counter operates properly. The EOL lamp should light about 4 to 7 characters before end-of-line.

5.37    Depress T button. Its lamp should light, K lamp should extinguish, keyboard should operate, tape punch should operate, and typing unit should not print.

5.38    On all stations, depress KT button. Its lamp should light, and T lamp extinguishes. Operate all character and function keytops; typing unit should print and function accordingly, tape should be punched, and EOL lamp should be lighted.

5.39    On ASR sets depress the ON button of the tape punch. Depress various characters and function keytops. The typing unit should print and the tape punch should punch the appropriate characters (except that the typing unit will not print functions).

5.40    Check punched code combinations in tape to make certain keyboard is transmitting the parity bits.

5.41    Depress LOC B. SP. keytop on keyboard several times. Tape should backspace each time keytop is depressed.

5.42    Depress RUB OUT keytop several times. Check tape for correct overpunching and make certain holes are not elongated.

5.43    Remove tape from tape punch and place in tape reader. Depress the TD ON button. Tape reader should operate. Monitor message being locally transmitted to typing unit, and message being punched by the punch.

5.44    Alternately depress the TD ON and TD OFF buttons. The reader should start and stop without transmitting errors.

5.45    While reader is operating open tape lid. Reader should stop. Close tape lid.

5.46    Depress the TD ON button and allow tape to run. Hold back tape as it feeds into reader. When tape becomes taut, reader should stop. Release tape and allow reader to process remaining tape. Reader should stop when tape runs out.

5.47    Place keyboard in each of the K, KT, and T modes and depress HERE IS keytop for each position. The station answer-back should operate and the answer-back sequence should be printed on the typing unit. In the KT mode, the station answer-back should be punched on tape.

5.48    With keyboard in each of the K, KT, and T modes, simultaneously depress CTRL and ENQ keytops. The answer-back should not operate. In the KT mode, the punch will punch the CTRL E.

5.49    Depress OFF button. Lamp should not come on; LOCAL key should release and its lamp extinguished; motor should turn off.

5.50    For the test procedures concerning data sets 108- and 109-type, refer to 5.17 through 5.31.