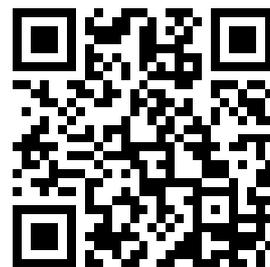
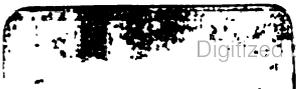

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HANDBOOK

6170.1

ELECTRONIC EQUIPMENT MODIFICATIONS HANDBOOK - DATA HANDLING EQUIPMENT

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January 14, 1969

DEPARTMENT OF TRANSPORTATION
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FOREWORD

1. **PURPOSE.** To publish a consolidated handbook on Data Handling Equipment in its revised subject number series.
2. **CANCELLATION.** Handbook AFP 6620.1, Communications Facilities and Equipment Modification Handbook - Data Handling Facilities and Equipment, dated 1/53, is cancelled.
3. **INFORMATION.** You will notice that the first 37 chapters are still in the old format formerly used for EEM's. A waiver was received from the Office of Management Systems to print this old format material. Upon revision the old chapters will be printed using the present directives format. In order to help you in identifying specific chapters, we purposely left the old EEM numbers on each chapter and have added the new chapter number.
4. **CHANGE IN DISTRIBUTION:** Three basic tests were used to distribute the modifications in Handbook AF P 6620.1. These were F-1 Items 8 "ADIS," Item 56 Automatic Data Interchange, "BDIS" and Item 30 Printing Telegraph Equipment." The quantity on Item 30 (approximately 2200 copies) should be sufficient to provide for ADIS and BDIS locations. Therefore, this Handbook will be restricted on Item 30 only.


M. M. Martin, Director
Systems Maintenance Service

10-30-69

ELECTRONIC EQUIPMENT MODIFICATION HANDBOOK
DATA HANDLING EQUIPMENT

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U. S. DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON 25, D. C.

January 22, 1958

ELECTRONIC EQUIPMENT MODIFICATION NO. 256; TYPE AN/FGC-5(1)

CHAPTER 9.

TO : All Regional Administrators

FROM : Chief, Communications Engineering Division

**SUBJECT: Modification of Electronic Multiplex AN/FGC-5 to Provide
a Synchronizing Pulse for Test Purposes**

1. OBJECT

1.1 The object of this modification is to provide a pulse that will synchronize the oscilloscope (lock-in) and permit accurate analysis of a stationary wave form.

2. REASON FOR MODIFICATION

2.1 Under present conditions it is not possible to stabilize the oscilloscope and provide a stationary pattern that can be accurately checked for intermittent pulses. This modification will make intermittent pulses plainly visible. The channel to be viewed can be centered on the oscilloscope screen by the synchronizing switch and widened by the horizontal gain control.

3. APPLICATION

3.1 This modification shall be made on all type AN/FGC-5 Electronic Multiplex.

4. REFERENCES

4.1 Instruction Book for AN/FGC-5 Electronic Multiplex.

4.1.1 Figure 2-18 Transmitter Signal Distributor
TT-58/FGC-5 page 2-21.

4.1.2 Figures 7-5 and 7-6 Transmitting Signal Distributor
TT-58/FGC-5 Relative Location of Circuit Components.
Pages 7-20 and 7-21.

4.1.3 Figure 7-43 Transmitting Signal Distributor
TT-58/FGC-5 Schematic Diagram page 7-79, 7-80.

4.1.4 Parts List pages 8-23 and 8-60.

4.2 Sketch Sk-B-45048 dated 11-21-57 attached.

5. MATERIALS REQUIRED

5.1 One each 2-section, non-shorting switch, Centralab-1411, or equal. Four each resistor, 0.47 megohm, 0.5 watt. One set, banana plug and jack. Hookup wire.

6. SOURCE OF MATERIALS

6.1 To be supplied by Regional Office or local purchase. Approximate cost \$5.00 per set.

7. TOOLS OR TEST EQUIPMENT REQUIRED

7.1 Miscellaneous small hand tools.

8. WORK TO BE PERFORMED BY

8.1 Station Maintenance personnel.

9. WHEN MODIFICATION TO BE PERFORMED

9.1 During routine maintenance of facility.

10. ESTIMATED TIME REQUIRED

10.1 Two hours for each AN/FGC-5 installed.

11. DISPOSITION OF SURPLUS PARTS

11.1 None

12. MODIFICATION PROCEDURE

12.1 Before any work is done deactivate the AN/FGC-5 to be modified by removing the main supply fuses.

12.2 Mount the Centralab switch or equal in the unused opening adjacent and to the left of S-501. Install 0.47 megohm resistors hookup with switch S-501 and J-501 as indicated on Sk-B-45048 attached.

12.3 Mount jack J-1104 or equal 1-inch to the left of the oscilloscope sync. jack and connect as shown on Sk-B-45048.

13. TESTS AFTER MODIFICATION

13.1 Before returning the AN/FGC-5 to service, visually inspect the modification and ascertain that installed items are secure and hookup is correct.

13.2 With the AN/FGC-5 unit in normal operation, the output of the switch should be connected to the sync. jack of the oscilloscope which will permit the oscilloscope to be synchronized with selected signal channels 1 to 4. The channel to be checked should be centered on the oscilloscope screen by means of the sync. switch and expanded by the horizontal gain control until the signal is of sufficient size to permit accurate analysis of the wave form.

14. USE

14.1 This modification does not affect the use of the AN/FGC-5.

15. RESULT OF MODIFICATION

15.1 Maintenance personnel can make a fast and accurate check of channel operation, thereby reducing both outage and maintenance time for the unit.

16. CORRECTIONS TO DRAWINGS

16.1 Staple a copy of Sk-B-45048 to Figure 7-43 with proper notation on the sketch regarding modification.

17. CORRECTIONS TO INSTRUCTIONS

17.1 Add parts installed to Parts List on pages 8-23 and 8-60. Make appropriate notation in "Corrective Maintenance Section" of the Instruction Book.

18. CORRECTIONS TO RECORD DATA

18.1 None.

19. RECOGNITION

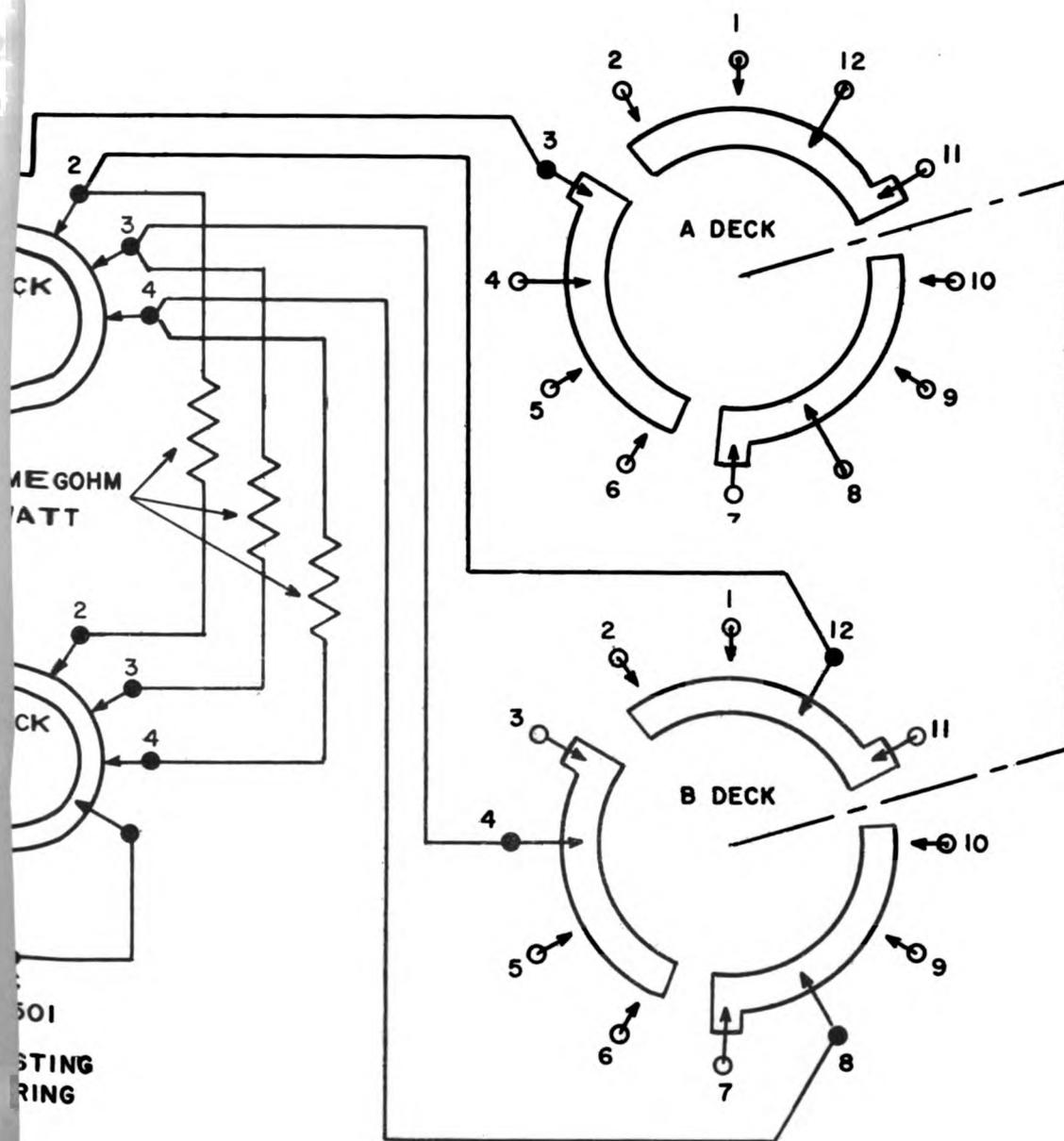
19.1 This modification was developed and tested by the Fourth Region.



G. E. Goudie, W-640

Attachment

S 501



5 MULTIPLEX TO
ON OSCILLOSCOPE

SK-B-45048
11-21-57

6170.1
1/14/69

U. S. DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON 25, D. C.

March 4, 1958

CHAPTER 10.

ELECTRONIC EQUIPMENT MODIFICATION NO. 263; TDA(1)

TO : All Regional Administrators
FROM : Chief, Communications Engineering Division
SUBJECT: To Provide a DPDT Switch on TDA-1 and TDA-2 Distortion Analyzers

1. OBJECT

1.1 To improve the accuracy and speed of checking reversal transmissions with the TDA Analyzer. This is accomplished by providing a switch that will disable the character time tube, V-5, which will then allow the baud time tube, V-6, to function as a "free running" multivibrator. Without synchronization from the start pulses used in normal start-stop telegraph operation, the speed pip will be presented on the Oscilloscope as an upward spike, traveling around the rectangular presentation of the oscilloscope face. The bias pips will appear as downward spikes, traveling in the same direction.

2. REASON FOR MODIFICATION

2.1 Although the TDA units are designed to measure reversals or dot cycles, tests by Fifth Region personnel indicate that when the character time tube, V-5, is not disabled, the speed adjustment is critical and requires careful time consuming refinement to provide lock-in when measuring reversals. When modified the TDA speed adjustment is not critical and can be adjusted to provide a stationary or slowly creeping pattern on the oscilloscope. Bias and distortion can be determined by the spacing between the speed and bias pips on the calibrated scale. Also by utilizing the "sync." disabling switch, convenient calibration of type CA-1501 and other bias test units used for reversal transmissions can be made.

3. APPLICATION

3.1 This modification will apply only to TDA test units supplied to IATCS where reversal transmissions are used for test purposes.

4. REFERENCES

4.1 Type TDA-1 and TDA-2 instruction book schematic diagrams.

4.2 Attached Sketch SK-A-45067.

5. MATERIALS REQUIRED

5.1 1 ea. bat-handle "center-off" DPDT switch

5.2 18 inch length of hook-up wire

5.3 1 ea. escutcheon plate

5.4 1 ea. single contact tie-point

6. SOURCE OF MATERIALS

6.1 To be supplied by the Region.

7. TOOLS OR TEST EQUIPMENT REQUIRED

7.1 Miscellaneous small hand tools.

8. WORK TO BE PERFORMED BY

8.1 Maintenance personnel at the facility involved.

9. WHEN MODIFICATION TO BE PERFORMED

9.1 When practicable during routine maintenance of facility.

10. ESTIMATED TIME REQUIRED

10.1 One Hour.

11. DISPOSITION OF SURPLUS PARTS

11.1 Retain in station stock or discard.

12. MODIFICATION PROCEDURE

- 12.1 Remove TDA chassis from the cabinet in accordance with Instruction Book directions.
- 12.2 Remove wiring to, and discard switch S-1 in TDA-1 units, or switch S-7 in TDA-2 units.
- 12.3 Remove lead from V-5 cathode resistor to negative buss. (R-18 in TDA-1 or R-23 in TDA-2)
- 12.4 Install tie-point on V-5 socket screw between socket pins 1 and 9.
- 12.5 Install new DPDT "center-off" switch in space vacated by switch removed in step 12.2 but do not tighten.
- 12.6 Connect free end of cathode resistor to tie-point, and run new lead from tie-point to pin 5 on new switch.
- 12.7 Connect lead from terminal No. 4 on new switch to negative buss.
- 12.8 Connect short jumper from terminal No. 1 to terminal No. 3 of new switch.
- 12.9 Connect lead from F-1 terminal to terminal No. 2 on new switch.
- 12.10 On TDA-1 units, connect lead from T-2, terminal No. 1 to terminal No. 3 on new switch S-1; on TDA-2 units connect lead from T-1, terminal No. 1 to terminal No. 3 on new switch S-7.
- 12.11 Dress all leads neatly and install new escutcheon plate, and tighten new switch.

13. TESTS AFTER MODIFICATION

- 13.1 Visually check all new wiring and solder joints.
- 13.2 Energize the TDA unit with the switch in the "sync-on" position, and check for normal circuit monitoring operation using a test transmission.
- 13.3 Change switch to "sync-off" position, and check speed pip for travel around rectangular oscilloscope pattern.

Introduce specific bias in test transmission and measure. Bias and distortion are read as the distance between the speed pip and the bias pip, on the rectangular presentation. The travel of the speed and bias pips may be slowed or momentarily stopped, by use of the speed control. The bias pips will appear as downward spikes on either the top or bottom baseline. It must be remembered that the location of the pips on the scale is not important as it is the distance between the pips that is a measure of the bias existing in the circuit. A zero bias condition is when the time pips occur at the same place along the baseline. Marking bias will be indicated when the bias pip occurs in time before the speed pip and will appear to the right. Spacing bias occurs when the bias pip is to the left of the speed pip on the baseline.

To calibrate a CA-1501 Bias Test Set, patch the TDA unit into the transmit loop where reversals are being transmitted, and adjust the "send bias" control of the CA-1501 until a zero bias condition is attained.

14. USE

14.1 This modification will not affect the use of the instrument.

15. RESULT OF MODIFICATION

15.1 This modification provides normal synchronization with switch in "up" position; power off in "center" position and removes synchronization in "down" position.

16. CORRECTIONS TO DRAWINGS

16.1 Correct instruction book schematic in ink as shown in attached sketch, Sketch SK-A-45067.

16.2 Add new DPDT "center-off" switch to parts list, and delete reference to the switch that was removed. Designate new switch as S-1 in TDA-1 and S-7 in TDA-2.

17. CORRECTIONS TO INSTRUCTIONS

17.1 Place a copy of this EEM in front of Instruction Book.

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MEM NO. 263; TDA(1)
March 4, 1958

18. CORRECTIONS TO RECORD DATA

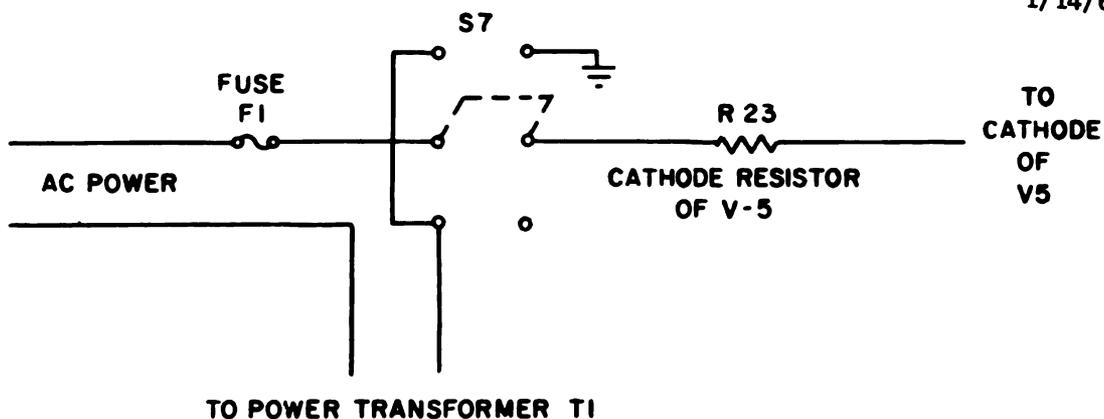
18.1 None.

19. RECOGNITION

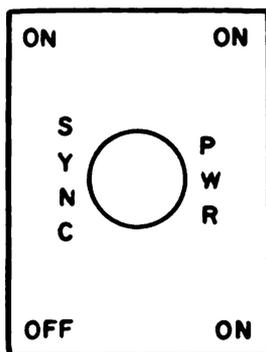
19.1 This modification was developed and tested by the
Fifth Region.

L. B. Blair
for G. E. Goudie, W-640

Attachment



SWITCH WIRING AS SEEN FROM REAR OF SWITCH.
S7 - J-B-T INSTRUMENTS, INC. TYPE ST52P OR EQUAL.
LIMITED SPACE FOR SWITCH INSTALLATION.



ESCUTCHEON PLATE FOR INSTALLATION
ON FRONT PANEL OVER POWER SWITCH

**MODIFICATION TO STELMA TELEGRAPH
DISTORTION ANALYZERS TDA-1 AND TDA-2**

6170.1
1/14/69

U. S. DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON, D. C.

June 16, 1958

CHAPTER 12.

ELECTRONIC EQUIPMENT MODIFICATION NO. 296 MODEL 28 TELETYPEWRITER CABINET (1)

TO : All Regional Administrators

FROM : Chief, Communications Engineering Division, W-640

SUBJECT: Modification of copy-light to provide remote control

1. OBJECT

1.1 To provide external on-off control of copy-light system in type 28 teletypewriter equipment.

2. REASON FOR MODIFICATION

2.1 The control switch is presently located inside the cabinet. To operate this switch requires lifting the lid of each printer. This requires that the operator leave his position during critical air traffic control operations, in order to extinguish the copy-light, thereby eliminating the tower window reflections caused by the copy-light in the machines.

3. APPLICATION

3.1 This modification may be made on all type 28 teletypewriter equipment, as required, at C/ST locations.

4. REFERENCES

4.1 Teletype Corporation specification 5853S, Issue 1, Page 1, February 1957 for 115V AC copy-light.

5. MATERIALS REQUIRED

5.1 Approximately 30 feet of single pair cable per machine.

5.2 One each SPST 110-115V toggle switch, per machine.

5.3 Mounting plate for toggle switches to accommodate switches as required.

ELECTRONIC EQUIPMENT MODIFICATION NO. 296 MODEL 28 TELETYPEWRITER CABINET (1)
June 16, 1958

6. SOURCE OF MATERIALS

6.1 To be procured locally or furnished by regional office as required.

6.2 Estimated cost per machine \$2.00.

7. TOOLS OR TEST EQUIPMENT REQUIRED

7.1 Miscellaneous small tools.

8. WORK TO BE PERFORMED BY

8.1 Maintenance Personnel.

9. WHEN MODIFICATION IS TO BE PERFORMED

9.1 During routine maintenance period.

10. ESTIMATED TIME REQUIRED

10.1 Approximately 20 minutes per machine.

11. DISPOSITION OF SURPLUS PARTS

11.1 None.

12. MODIFICATION PROCEDURES

12.1 Refer to Teletype Drawing 3236WD.

12.2 Remove T-2-W from cabinet terminal block "C", terminal 40.

12.3 Splice and tape one wire of cable pair to T-2-W.

12.4 Connect other wire of cable pair to terminal 40.

12.5 Secure pair in cabinet and run to control position.

12.6 Mount SPST switch on mounting plate and install mounting plate in convenient location to be operated by controller.

12.7 Connect cable pair to switch connections.

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ELECTRONIC EQUIPMENT MODIFICATION NO. 296 MODEL 28 TELETYPEWRITER CABINET (1)
June 16, 1958

13. TEST AFTER MODIFICATION

- 13.1 Determine if remote switch functions to extinguish copy-light in printer cabinet.
- 13.2 Inspect for general appearance and neatness.

14. USE

- 14.1 This is a temporary modification pending implementation of a light dimming modification, now in the process of development by the Teletype Corporation.
- 14.2 This modification will permit the controller to extinguish lights in printers that tend to cause reflections from tower windows.

15. RESULT OF MODIFICATION

- 15.1 This modification will place a switch between terminal 40 of the cabinet terminal block and the primary of the lighting transformer.

16. CORRECTIONS TO DRAWINGS

- 16.1 Show SPST switch in series between terminal 40 and T-2-W, Teletype Drawing 3236WD.

17. CORRECTIONS TO INSTRUCTIONS

- 17.1 None.

18. CORRECTIONS TO 198 DATA

- 18.1 None.

19. COORDINATION

- 19.1 This modification was coordinated with Operations Division W-520.
- 19.2 This modification is the result of Employee Suggestion KC-10776.

6170.1
1/14/69

ELECTRONIC EQUIPMENT MODIFICATION NO. 296 MODEL 28 TELETYPEWRITER CABINET (1)
June 16, 1958

20. LIMITATIONS

20.1 This modification is authorized for C/ST locations where Region has determined that reflections from tower windows create a hazardous condition.

G. E. Goudie
G. E. Goudie, W-640

6170.1
1/14/69

U. S. DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON, D. C.

CHAPTER 13.

August 20, 1958

ELECTRONIC EQUIPMENT MODIFICATION TELETYPEWRITER TYPE 28 (2) - EEM NO. 301

TO : All Regional Administrators
FROM : Chief, Communications Engineering Division, W-640
SUBJECT : Modification of Type 28 Teletypewriter to Provide End Posts for
Printing Mechanism

1. OBJECT

1.1 To provide end posts for resting printing mechanism during servicing and maintenance periods.

2. REASON FOR MODIFICATION

2.1 Machines without end posts cannot be rested on ends without risking damage to mechanism. This modification will correct this problem.

3. APPLICATION

3.1 This modification will apply to all type 28 teletypewriter printing units.

4. REFERENCES

4.1 Teletype Corporation specification 5761S, issue 2, page 1, December 1957, instructions for installing the 152301 set of parts on a model 28 typing unit to permit resting the unit on end for servicing.

5. MATERIALS REQUIRED

5.1 One each set of parts no. 159358 for each type 28 typing unit consisting of teletypewriter parts as follows:

- 2 each no. 151627 rod
- 4 each no. 152258 post
- 1 each no. 153809 supporting post assembly

Electronic Equipment Modification Teletypewriter Type 28 (2) - EEM NO. 301
Page Two

6. SOURCE OF MATERIAL

6.1 To be supplied by Washington office procurement, subject to availability of funds.

7. TOOLS OR TEST EQUIPMENT REQUIRED

7.1 Miscellaneous small tools.

8. WORK TO BE PERFORMED BY

8.1 Maintenance personnel.

9. WHEN MODIFICATION TO BE PERFORMED

9.1 During routine maintenance after receipt of necessary parts.

10. ESTIMATED TIME REQUIRED

10.1 One-half man hour.

11. DISPOSITION OF SURPLUS PARTS

11.1 None.

12. MODIFICATION PROCEDURE

12.1 Place 151627 rod between end plates of typing unit.

12.2 Insert 152258 threaded post through end plates into 151627 tapped rods and tighten in place.

12.3 Insert 153809 supporting post assembly (see para. 2.a and b spec. 5761S).

13. TEST AFTER MODIFICATION

13.1 Make visual and functional inspection of work. Determine general appearance and tightness. Ascertain if installation has adverse effect on operation or maintenance.

14. USE

14.1 This installation will permit resting unit on either end for servicing.

6170.1
1/14/69

Electronic Equipment Modification Teletypewriter Type 28 (2) - EEM NO. 301
Page Three

15. RESULT OF MODIFICATION

15.1 This modification does not affect the operational features of the equipment.

16. CORRECTIONS TO DRAWINGS

16.1 None.

17. CORRECTIONS TO INSTRUCTIONS

17.1 Insert copy of Teletype Corporation specification 5761S in its proper place in the instruction book.

18. CORRECTIONS TO FORM 198 DATA

18.1 None.

19. COORDINATION

19.1 This modification is the result of a region 5 employee suggestion no. AN-18047.


G. E. Goudie, W-640

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

March 29, 1960

CHAPTER 14.

ELECTRONIC EQUIPMENT MODIFICATION TELETYPEWRITER TYPE 28(4)-HEM NO. 509

TO : Chief, Facilities and Materiel Field
Division Nos. 1-4
Regional Manager, Regions 5 & 6

FROM : Chief, Maintenance Engineering Branch, FM-130

SUBJECT: Paper Winder Mounting Bracket, M28 Teletypewriter Page Printer

1. OBJECT:

1.1 To provide a means of mounting the PW206 Paper Winder used for automatically rolling up printed copy on a M28 Teletypewriter (Page Printer).

2. REASON FOR MODIFICATION:

2.1 To provide a means of handling printed copy on a M28 Teletypewriter (Page Printer) during unattended periods.

3. APPLICATION:

3.1 This modification shall be the authorized method for mounting the PW206 Paper Winder on machines at those locations where this operating problem arises.

4. REFERENCE:

4.1 Teletype Corporation Bulletin Number 1149B, page 4-10.

5. MATERIAL REQUIRED:

5.1 Teletype Corporation Modification Kit, Part No. 153901.

6. SOURCE OF MATERIAL:

6.1 To be supplied locally by Regional Office.

7. TOOLS AND EQUIPMENT REQUIRED:

7.1 Standard teletypewriter tools.

ELECTRONIC EQUIPMENT MODIFICATION TELETYPEWRITER TYPE 28(4)-EBM NO. 509
March 29, 1960

8. WORK TO BE PERFORMED BY:
- 8.1 Maintenance personnel on units already installed.
 - 8.2 Installation personnel on new installations.
9. WHEN MODIFICATION IS TO BE PERFORMED:
- 9.1 When authorized and scheduled by the cognizant Regional Office authority.
10. ESTIMATED TIME REQUIRED:
- 10.1 One man-hour.
11. DISPOSITION OF SURPLUS PARTS:
- 11.1 None, paragraphs 14 and 16 not applicable.
12. MODIFICATION PROCEDURE:
- 12.1 Follow step by step procedure outlined in specification enclosed with set of parts.
13. TEST AFTER MODIFICATION:
- 13.1 Make visual inspection to determine general appearance and function.
15. RESULTS OF MODIFICATION:
- 15.1 When Teletype Corporation's Set of Parts No. 153901 has been installed on a M28 Teletypewriter (Page Printer), it will provide a means of mounting a PW206 Paper Winder.
17. CORRECTIONS TO INSTRUCTIONS:
- 17.1 Attach specification sheet to Instruction Book.
18. CORRECTIONS TO FORM 198 DATA ACA-416:
- 18.1 Not applicable to Form 198 Data.
 - 18.2 Enter under remarks on Form ACA-416 modified in accordance with EBM 509.

6170.1
1/14/69

ELECTRONIC EQUIPMENT MODIFICATION TELETYPEWRITER TYPE 28(4)-REM NO. 509
MARCH 29, 1960

19. COORDINATION:

19.1 This modification has been coordinated with the Establishment Engineering Division.

20. IMPLEMENTATION:

20.1 This modification is optional and will be implemented at locations where the Regional Office has determined that sufficient justification exists.

Paul R. Colby
for Richard C. Young, FM-130

This modification was
requested by Region One

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

May 18, 1960

CHAPTER 15.

ELECTRONIC EQUIPMENT MODIFICATION TELETYPEWRITER TYPE M28(6)-EEM NO. 519

TO : Chief, Facilities and Materiel Field
Division Nos. 1-4
Regional Manager, Regions 5 & 6

FROM : Chief, Maintenance Engineering Branch, FM-130

SUBJECT: Modification of Left and Front Frame of the M28 Typing Unit
for Mounting in an ASR Set

1. OBJECT:

1.1 To provide adequate clearance at left side of the M28 Typing Unit when it is mounted in an ASR Set.

2. REASON FOR MODIFICATION:

2.1 To standardize all M28 Typing Units for mounting clearance in the LAAC206AB Apparatus Cabinet.

3. APPLICATION:

3.1 This modification shall be made on all M28 Typing Units, not presently modified.

4. REFERENCE:

4.1 Teletype Corporation Bulletin No. 1149B, pages 2-26 and 2-28.

5. MATERIALS REQUIRED:

5.1 None, paragraphs 6, 11 and 16 not applicable.

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Miscellaneous small hand tools.

ELECTRONIC MODIFICATION TELETYPEWRITER TYPE M28(6)-EEM NO. 519

8. WORK TO BE PERFORMED BY:

- 8.1 Maintenance personnel at existing facilities.
- 8.2 FMD as part of periodic over-haul program.

9. WHEN MODIFICATION IS TO BE PERFORMED:

- 9.1 Completed prior to January 1, 1961 for existing facilities, (8.1).
- 9.2 As programmed by FMD, (8.2).

10. ESTIMATED TIME REQUIRED:

- 10.1 Four man-hours.

12. MODIFICATION PROCEDURE:

- 12.1 See Sketch No. SK-A-135-2 for details of the layout and cuts required by modification EEM No. 519.
- 12.2 Lay out and cut off a section of the left side plate, Teletypewriter Part No. 150554.
- 12.3 Lay out and cut off a section of the left side front plate, Teletypewriter Part No. 152538 and a section of the left side plate, Teletypewriter Part No. 150554.

13. TEST AFTER MODIFICATION:

- 13.1 Make a visual inspection of the work to determine that the general appearance and function of the equipment is satisfactory.
- 13.2 If an ASR Set is available conduct a check-test, by installing a M28 Typing Unit, to ascertain if the modification has provided necessary clearance and whether the M28 Typing Unit functions properly.

14. USE:

- 14.1 After modification, use the Teletypewriter Part No. 159358, Set of Parts, which will permit resting the M28 Typing Unit on either the left or right end for servicing.

6170.1
1/14/69

ELECTRONIC EQUIPMENT MODIFICATION TELETYPEWRITER TYPE M28(6)-EEM NO. 519

15. RESULT OF MODIFICATIONS:

15.1 Standardization of all M28 Typing Units, permitting interchange of typing from R-O bases to ASR bases.

17. CORRECTIONS TO INSTRUCTIONS:

17.1 Attach a copy of EEM No. 519 to Bulletin No. 1149B.

18. CORRECTIONS TO FORM 198 AND ACA-416 DATA:

18.1 Not applicable to Form 198.

18.2 Enter under remarks on Form ACA-416: "Modified in accordance with EEM 519."

19. COORDINATION:

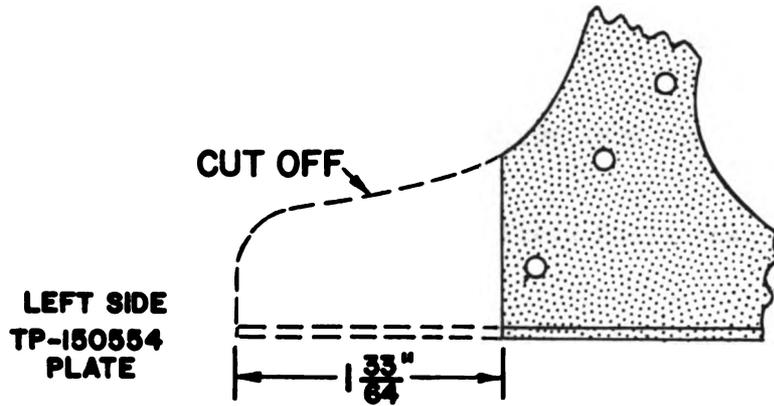
19.1 This modification has been coordinated with the Systems Equipment Division.

20. RECOGNITION:

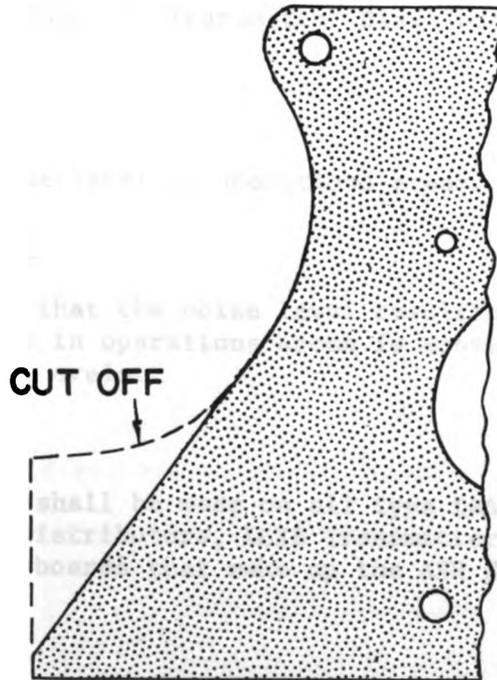
20.1 This modification was requested by Region Three.

Paul R. Colby
for Richard C. Young, FM-130

Attachment
Sketch No. SK-A-135-2



LEFT SIDE
TP-150554
PLATE



LEFT SIDE
TP-152538
FRONT PLATE

**M-28-TELETYPEWRITER (6) LEFT
AND FRONT PLATE MODIFICATION
FOR ASR SET MOUNTING.**

**SK-A-135-2
4-27-60**

6170.1
1/14/69

FEDERAL AVIATION AGENCY

Washington, D.C.

CHAPTER 16.

November 2, 1960

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPE TYPE 28 (7) EEM No. 532

**TO : Chief, Facilities and Materiel Field Divisions, Nos. 1-4
FM-1000 to FM-4000**

Regional Managers, Regions 5 & 6

FROM : Chief, Communications Engineering Branch

**SUBJECT: Modification Kits to Reduce the Noise Level of ASR Sets
Incorporating the Model 28 Transmitter Distributor LEXD**

1. OBJECT

1.1 To reduce the noise level in operations areas.

2. REASON FOR MODIFICATION

2.1 It has been noted that the noise level resulting from operating ASR sets in operations areas is above the desirable maximum levels.

3. APPLICATION

3.1 This modification shall be made on all type LAAC Cabinets, LEXD Transmitter Distributors, LCXB Transmitter Distributor Bases, and LAK Keyboards that make up the ASR Set.

4. REFERENCES

4.1 Teletype Specification 5941S Issue No. 2 dated September, 1959

5. MATERIALS REQUIRED

5.1 Materials required for each ASR Set not already equipped with a Noise Reduction Kit (To be determined at each individual Site).

5.1.1 Kit, Modification, Teletype Corp. P/N 161868

5.2 Materials required for each ASR Set not already equipped with the Nylon Gear Sets. (To be determined at each individual Site and only one set ordered for the required equipment speed).

5.2.1 Kit, Modification, Teletype Corp. P/N 161293 for 60 WPM.

5.2.2 Kit, Modification, Teletype Corp. P/N 161294 for 75 WPM.

5.2.3 Kit, Modification, Teletype Corp. P/N 161295 for 100 WPM.

6. SOURCE OF MATERIALS

6.1 To be requisitioned from the Operating Materiel Branch (OMB) under the following NSC numbers:

| | | |
|-----------------------------------|----------|-------------------|
| The Kit required in Section 5.1.1 | Cat. No. | <u>00-0019.00</u> |
| The Kit required in Section 5.2.1 | Cat. No. | <u>00-0020-00</u> |
| The Kit required in Section 5.2.2 | Cat. No. | <u>00-0021.00</u> |
| The Kit required in Section 5.2.3 | Cat. No. | <u>00-0022.00</u> |

7. TOOLS OR TEST EQUIPMENT REQUIRED

7.1 Standard Teletypewriter Tools and Test Equipment

7.2 Miscellaneous small hand tools.

8. WORK TO BE PERFORMED BY

8.1 Maintenance personnel on units already installed.

8.2 Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED

9.1 At the discretion of the Region.

10. ESTIMATED TIME REQUIRED

10.1 Six man hours per ASR Set.

11. MODIFICATION PROCEDURE

11.1 Follow step by step procedure outlined in Specification enclosed with each modification kit.

11.2 Omit items listed in Instructions for Modification Kit 161869 and all instructions for modification of ASR Sets utilizing the LXD fixed head single contact Transmitter Distributors.

12. DISPOSITION OF SURPLUS PARTS

12.1 Discarded parts and material should be retained in station stock.

13. RESULTS OF MODIFICATION

13.1 This modification permits the Model 28 ASR Set to operate with a reduced external noise level.

14. CORRECTION TO DRAWINGS

14.1 Not applicable

15. CORRECTIONS TO INSTRUCTIONS

15.1 Attach Specification 5941S to Instruction Bulletins

16. CORRECTION TO FORM 198 DATA AND ACA-416

16.1 Not applicable to Form 198 Data.

16.2 Enter under remarks on ACA-416 "Modified in accordance with KEM No. 532".

17. USE

17.1 No special techniques or cautionary measures required after modification.

18. COORDINATION

18.1 This modification has been coordinated with the Maintenance Engineering Branch.

19. TEST AFTER MODIFICATION

19.1 Make visual check of work to determine general appearance and that all screws are tight.

19.2 Check to see that all units operate properly and that correct adjustments have been made.

L. B. Blair
L. B. Blair, FM-340

6170.1
1/14/69

FEDERAL AVIATION AGENCY

Washington 25, D. C.

CHAPTER 17.

June 6, 1960

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPE TYPE 28 (8) EEM No. 533

TO : Chief, Facilities and Materiel Field Division Nos. 1 - 4
FM-1000 to FM-4000

Regional Manager, Regions 5 & 6

FROM : Chief, Communications Engineering Branch, FM-340

SUBJECT: Modification Kit to Add Teletype Part Number 17522
Current Limiting Resistor to Teletype Part Number
160356 Relay Control Group

1. OBJECT

1.1 To limit the current drawn through the RY33 line relay marking contacts to a safe value.

2. REASON FOR MODIFICATION

2.1 The Teletype part number 160363 Capacitor momentarily draws through the RY33 Line Relay marking contacts, a current many times higher than the contact design rating. This causes premature burning and corroding of the contacts.

3. APPLICATION

3.1 This modification will be made on all Model 28 Teletype equipment containing the Teletype part number 160356 Relay Control Group.

4. REFERENCES

4.1 Teletype Bulletin 1169B Page 6-22 Figure 6-12 for parts location.

5. MATERIALS REQUIRED

5.1 One each Teletype Modification Kit Number 173022 for each Model 28 Teletype equipment containing the Teletype part number 160356 Relay Control Group.

6. SOURCE OF MATERIALS

6.1 Modification Kits are to be provided by the Washington Office through the Facilities Materiel Depot, or the Operating Materials Depot upon receipt of completed ACA-1660 from Regions or ATFO showing site codes.

7. TOOLS OR TEST EQUIPMENT REQUIRED

7.1 Miscellaneous small hand tools.

8. WORK TO BE PERFORMED BY

8.1 Maintenance personnel on units already installed.

8.2 Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED

9.1 Immediately on receipt of Modification Kit.

10. ESTIMATED TIME REQUIRED

10.1 Fifteen minutes per Teletype 160356 Relay Control Group.

11. MODIFICATION PROCEDURE

11.1 Mounting of 172971 Terminal Board

- a. Remove (1) 125170 screw, (1) 44048 lock washer and (1) 79012 flat washer from 160328 relay.
- b. Attach 172971 terminal board by replacing components in paragraph a. above in reverse order from that in which removed.

11.2 Mounting and Electrical interconnecting of 171522 Resistor

- a. Unsolder and remove green lead from terminal (A) of 160328 relay.

- b. Attach and solder on lead of 171522 resistor to terminal (A) of 160328 relay, and other lead of resistor to terminal of 172971 terminal board.
- c. Attach and solder green lead removed from terminal (A) of 160328 relay to terminal of 172971 terminal board.

12. DISPOSITION OF SURPLUS PARTS

12.1 No surplus parts involved.

13. RESULT OF MODIFICATION

13.1 This modification permits the RY33 Relay contacts to operate within the design current limitations.

14. CORRECTION TO DRAWINGS

14.1 Teletype Drawings WD3463 and WD3464 should be corrected to include this modification.

14.2 FAA Drawings DR-E-40026-1, DR-E-40026-2, DR-E-40026-3, DR-E-40026-4 and DR-E-40026-5 should be corrected to include this modification.

15. CORRECTION TO INSTRUCTIONS

15.1 None required.

16. CORRECTION TO FORM 198 DATA and FORM ACA-416

16.1 Not applicable to Form 198 Data.

16.2 Enter under remarks on ACA-416 "Modified in accordance with EEM No. 533".

17. USE

17.1 No special techniques or cautionary measures required after modification.

18. COORDINATION

18.1 This modification has been coordinated with the Maintenance Engineering Branch.

19. TEST AFTER MODIFICATION

19.1 Make visual check of work to determine general appearance.

19.2 Check to see that all units operate properly.



L. B. Blair, FM-240

6170.1
1/14/69

FEDERAL AVIATION AGENCY

Washington 25, D. C.

CHAPTER 18.

November 17, 1960

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPE TYPE 14 (1) EEM No. 534

TO : Chief, Facilities and Materiel Field Division, Nos. 1-4
Regional Manager, Regions 5 and 6

FROM : Chief, Communications Engineering Branch, FM-340

SUBJECT: Modification Kits to Provide an All Steel Internal Expansion
Clutch on the Model 14 Transmitter Distributor

1. OBJECT:

1.1 To provide improved clutch stability, improved signal quality,
and increased speed capabilities.

2. REASON

2.1 To eliminate heat, wear, lubrication, and frequent adjustment of
friction type clutches.

2.2 To provide increased operating speeds, faster and more positive
clutch action, and less motor load with clutch disengaged.

3. APPLICATION

3.1 This modification is to be performed on all Model 14 Transmitter
Distributors.

4. REFERENCES

4.1 Teletype Specification 57878 Issue No. 6 dated February 1959.

4.2 Teletype Supplement 843EE, Issue No. 6 dated September 1959 to
Bulletin 141B, Issue No. 3.

4.3 Teletype Supplement 844EE to Bulletin 1095B dated January 1958.

5. MATERIALS REQUIRED

5.1 Materials required for each M-14 Transmitter Distributor not already equipped with a Steel Internal Expansion Clutch (To be determined at each individual Site).

5.1.1 Kit, Modification, Teletype Corp. P/N 113770 (includes gears for 75 WPM).

5.2 Materials required for each M-14 Transmitter Distributor which will require operation at speeds other than 75 WPM (To be determined at each individual Site and only one set ordered for the required equipment speed).

5.2.1 Kit, Modification, Teletype Corp. P/N 80166 and P/N 135036 for 60 WPM.

5.2.2 Kit, Modification, Teletype Corp. P/N 135065 and P/N 116767 for 66.7 WPM.

5.2.3 Kit, Modification, Teletype Corp. P/N 136153 for 100 WPM .

6. SOURCE OF MATERIALS

6.1 To be requisitioned from the Operating Materiel Branch (OMB) under the following NSC numbers:

The Kit required in Section 5.1.1 Cat. No. 00-0023.00

The Kit required in Section 5.2.1 Cat. No. 00-0024.00

The Kit required in Section 5.2.2 Cat. No. 00-0025.00

The Kit required in Section 5.2.3 Cat. No. 00-0026.00

7. TOOLS OR TEST EQUIPMENT REQUIRED

7.1 Standard Teletypewriter Tools and Test Equipment.

7.2 Miscellaneous small hand tools.

8. WORK TO BE PERFORMED BY

8.1 Maintenance personnel on units already installed.

8.2 Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED

9.1 At the discretion of the Regional Office.

10. ESTIMATED TIME REQUIRED

10.1 Four man hours per Model 14 Transmitter Distributor Set.

11. MODIFICATION PROCEDURE

11.1 Follow step by step procedure outlined in Specification 5787S enclosed with each Modification Kit.

12. DISPOSITION OF SURPLUS PARTS

12.1 Discarded parts should be retained in station stock pending further disposition.

13. RESULT OF MODIFICATION

13.1 This modification permits the Model 14 Transmitter Distributor to operate at 100 WPM with reduced maintenance requirements.

14. CORRECTION TO DRAWINGS

14.1 Attach Specification 5797~~2~~ to Bulletin 141B.

15. CORRECTIONS TO INSTRUCTIONS

15.1 Attach Supplement 844EE to Teletype Bulletin 1095B.
Attach Supplement 843EE to Teletype Bulletin 141B.

16. CORRECTION TO FORM 198 DATA AND FORM ACA-416

16.1 Enter under remarks on ACA-416 "Modified in accordance with EEM No. 534".

17. USE

17.1 No special techniques or cautionary measures required after modification.

18. COORDINATION

18.1 This modification has been coordinated with the Maintenance Engineering Branch.

19. TEST AFTER MODIFICATION

19.1 Make visual inspection of work to determine general appearance and that all screws are tight.

19.2 Check to see that all parts operate properly and that correct adjustments have been made.

19.3 Clutch shoes should be disengaged from the drum with the clutch disk latched and the clutch assembly should be free to drag.

Turner N. Wiley
for L. B. Blair, FM-340

6170.1
1/14/69

FEDERAL AVIATION AGENCY

Washington 25, D. C.

November 2, 1960

CHAPTER 19.

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPE TYPE 14 (2) FEM No. 537

TO : Chief, Facilities and Materiel Field Division, Nos. 1-4
Regional Manager, Regions 5 and 6

FROM : Chief, Communications Engineering Branch

SUBJECT: Modification Kits to Provide A 32 Point Slip Connector
on the Model 14 Transmitter Distributor

1. OBJECT

1.1 To provide a universal standard connection to facilitate additional wiring requirements.

2. REASON FOR MODIFICATION

2.1 To allow additional connection for increased electrical control requirements.

3. APPLICATION

3.1 This modification is to be performed on all Model 14 Transmitter Distributors.

4. REFERENCES

4.1 FAA Drawing DR-D-40052-1 Model 14 XD arranged for Automatic Service.

5. MATERIALS REQUIRED

5.1 Materials required for each M-14 Transmitter Distributor not already equipped with a 32 point strip connector (To be determined at each individual Site).

5.1.1 Kit, Modification, Teletype Corp. P/N 142660 Cable Assembly.

5.1.2 Kit, Modification, Teletype Corp. P/N 113812 Connector.

6. SOURCE OF MATERIALS

6.1 To be stocked at the Operating Materiel Branch (OMB) in two kits.

The Kit required in Section 5.1.1 will be stocked under Catalog No.
00-0027.00

The Kit required in Section 5.1.2 will be stocked under Catalog No.
00-0028.00

7. TOOLS OR TEST EQUIPMENT REQUIRED

7.1 Standard Teletypewriter tools and test equipment.

7.2 Drilling Jig Drawing 70682 (attached to this EEM) used to align holes on underside of Transmitter Distributor casting on which a new 32 point male connector will be mounted.

8. WORK TO BE PERFORMED BY

8.1 Maintenance personnel on units already installed.

8.2 Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED

9.1 At the discretion of the Regional Office.

10. ESTIMATED TIME REQUIRED

10.1 Four man hours per Model 14 Transmitter Distributor.

11. MODIFICATION PROCEDURE

11.1 Remove and discard all wiring contained in old cable assembly terminating on the 9 point connector. Remove and discard the 9 point connector.

11.2 Using the Drilling Jig Drawing 70682 (attached to the EEM) mark and drill mounting holes for Teletype Part Number 113812 connector.

- 11.3 With the 113812 connector unmounted, terminate the new cable on the solder terminals as shown on Drawing DR-D-40052-1.
 - 11.4 Place 142660 Cable Assembly in the same general position as the cable that was removed. Mount the 113812 connector using the 4 fillister head 6/32 x 1 machine screws provided with connector.
 - 11.5 Connect balance of cable in accordance with Drawing DR-D-40052-1.
 - 11.6 Remove start-stop push button assembly from all Model 14 Transmitter Distributors that have been modified in accordance with EEM 170 and replace with a 2 pole double throw toggle switch.
12. DISPOSITION OF SURPLUS PARTS
- 12.1 Retain 9 point connector in station stock pending further disposition.
13. RESULT OF MODIFICATION
- 13.1 This modification provides additional electrical connections for control circuits and allows interchangeability of all Model 14 Transmitter Distributors.
14. CORRECTION TO DRAWINGS
- 14.1 A copy of FAA Drawing DR-D-40052-1 Model 14 X D Arranged for Automatic Service should be kept with Model 14 Transmitter Distributor Instruction Bulletins.
15. CORRECTIONS TO INSTRUCTIONS
- 15.1 A copy of EEM 537 should be kept with the Model 14 Transmitter Distributor Instruction Bulletins.
16. CORRECTION TO FORM 198 DATA AND FORM ACA-416
- 16.1 Not applicable to Form 198 Data.
 - 16.2 Enter under remarks on ACA-416 "Modified in accordance with EEM No. 537".

17. USE

17.1 The modified Model 14 Transmitter Distributor will operate on all Mounting Plate Assemblies connected in accordance with FAA Drawing DR-D-40052-1.

18. COORDINATION

18.1 This modification has been coordinated with the Maintenance Engineering Branch.

19. TEST AFTER MODIFICATION

19.1 Make a visual inspection of the work to determine general appearance, tightness of connections, etc.

19.2 Make a final test of the operation of the entire equipment to ascertain if the modification performs as intended and instruct Operations Personnel in the use of the equipment.



L. B. Blair, FM-340

Attachments: (2)

- 1 - Drilling Jig Drawing 70682
- 2 - FAA Drawing DR-D-40052-1

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 20.

March 26, 1962

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 558 - TELETYPEWRITER TYPE 28(9)

SUBJECT: Page Printer Function Box - LP; Switch Assembly

FROM : Chief, Maintenance Engineering Branch, AF-130

TO : Assistant Administrators, All Regions
ATTN: Chiefs, Aviation Facilities Divisions
Manager, Aviation Facilities Depot, AF-900
ATTN: Chief, Program Materiel Branch, AF-970
Chief, Operation Materiel Branch, AF-980
Director, Office of Personnel and Training, PT-900
ATTN: Chief, Facilities and Materiel Training Division, PT-940

1. OBJECT:

1.1 To gradually modernize all M28 Printers, Code LP, by replacing failing function box switch assemblies with newly designed switch assemblies less subject to failures currently being reported from the field. This will increase efficiency of the data-handling system and reduce the maintenance burden.

2. REASON FOR MODIFICATION:

2.1 To update all M28 Printers comparable to the latest units off the production line, thereby reducing maintenance demands and increasing efficiency of the data-handling system, particularly at the higher speeds.

3. APPLICATION:

3.1 This modification establishes the standard stunt box switch assembly and component parts as follows:

| <u>Switch</u> <u>Assem.</u> | <u>Contact</u> <u>Plate</u> <u>Assem.</u> | <u>Contact Arm No. in Position</u> | | | | <u>Contact</u> <u>Arm</u> <u>Spring</u> | <u>Contact</u> <u>Block</u> |
|--------------------------------|---|------------------------------------|----------|----------|----------|---|--------------------------------|
| | | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | | |
| <u>New:</u> 172525 | 172595 | 157887 | 157887 | 157887 | 157887 | 172591 | 172597 |
| <u>Old:</u> 157095 | 157892 | 157887 | 157887 | 157887 | 157887 | 157889 | 157884 |

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 558 - TELETYPEWRITER TYPE 28(9)

3.2 All earlier, lower numbered, switch assemblies shall be replaced as well. These earlier parts may be found on the first consignment of eleven hundred-odd printers procured for Service "B".

3.3 All new equipment procured on future programs will be equipped with these new parts now standard.

4. REFERENCES:

4.1 Teletype Corporation Bulletin No. 1149B, Parts - Model 28 Page Printer Set. (KSR & RO)

4.2 FAA Sketch No. SK-B-135-4, dated June 28, 1960. (attached)

5. MATERIALS REQUIRED:

5.1 Teletype Corporation Part No. 172525, Switch Assembly.

6. SOURCE OF MATERIALS:

6.1 OMB stock.

7. TOOLS AND EQUIPMENT REQUIRED:

7.1 Standard teletypewriter tools.

8. WORK TO BE PERFORMED BY:

8.1 Maintenance field office and station personnel where trouble is encountered, and during major maintenance service schedules.

8.2 PMB shop and/or regional shop personnel during E&R overhauls.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 During routine maintenance when connecting circuit wires must be soldered or unsoldered from the 157095. (because heat affects spring tension of the old style contacts)

9.2 Upon occurrence of any 157095 switch operation trouble. (In which case all switches in that function box shall be replaced.)

9.3 Upon major maintenance schedule service.

9.4 Upon major E&R shop overhaul at PMB and/or at regional shop in the case of Alaskan and Hawaiian Regions.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 558 - TELETYPEWRITER TYPE 28(9)

10. ESTIMATED TIME REQUIRED:

10.1 One man-hour per switch assembly. (Approximately 3 to 6 switches per LP and 5,500 LPs in standard systems.)

11. DISPOSITION OF SURPLUS PARTS:

11.1 Discard parts:

- (a) 157892 - Contact Plate Assembly
- (b) 157889 - Spring

11.2 Retain as spares, parts:

- (a) 157887

12. MODIFICATION PROCEDURE:

12.1 Unsolder old contact assembly and solder in the new contact assembly.

12.2 Observe and check adjustment provisions of applicable Teletype Corporation Adjustment Bulletin. (see EFI/PTE-5)

13. TEST AFTER INSPECTION:

13.1 Check on-line operation of function box switch assemblies after bench tests.

14. USE:

14.1 FAA System-Wide, without exception, on all M28 units.

15. RESULT OF MODIFICATION:

15.1 Reduced maintenance requirements and increased contact pulsing efficiency through standardization of a switch assembly not requiring soldered connection to the steel spring material which would result in spring tension and contact timing variations.

16. CORRECTIONS TO DRAWINGS:

16.1 None.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 558 - TELETYPEWRITER TYPE 28(9)

17. CORRECTIONS TO INSTRUCTIONS:

17.1 Insert EEM Sketch No. SK-B-135-4 into Parts Bulletin 1149B.
(Teletype Corporation will later issue a revised bulletin page to cover)

18. CORRECTIONS TO FORM 198 AND ACA-416 DATA:

18.1 Not applicable to Form 198.

18.2 Enter under remarks on Form ACA-416: "Modified in accordance with EEM No. 558."

19. COORDINATION:

19.1 This modification has been coordinated with the Communications Engineering Branch.

20. IMPLEMENTATION:

20.1 This modification is planned for gradual phasing out of obsolete switches and their replacement by the new standard, with consideration for immediate replacement in the case of trouble.

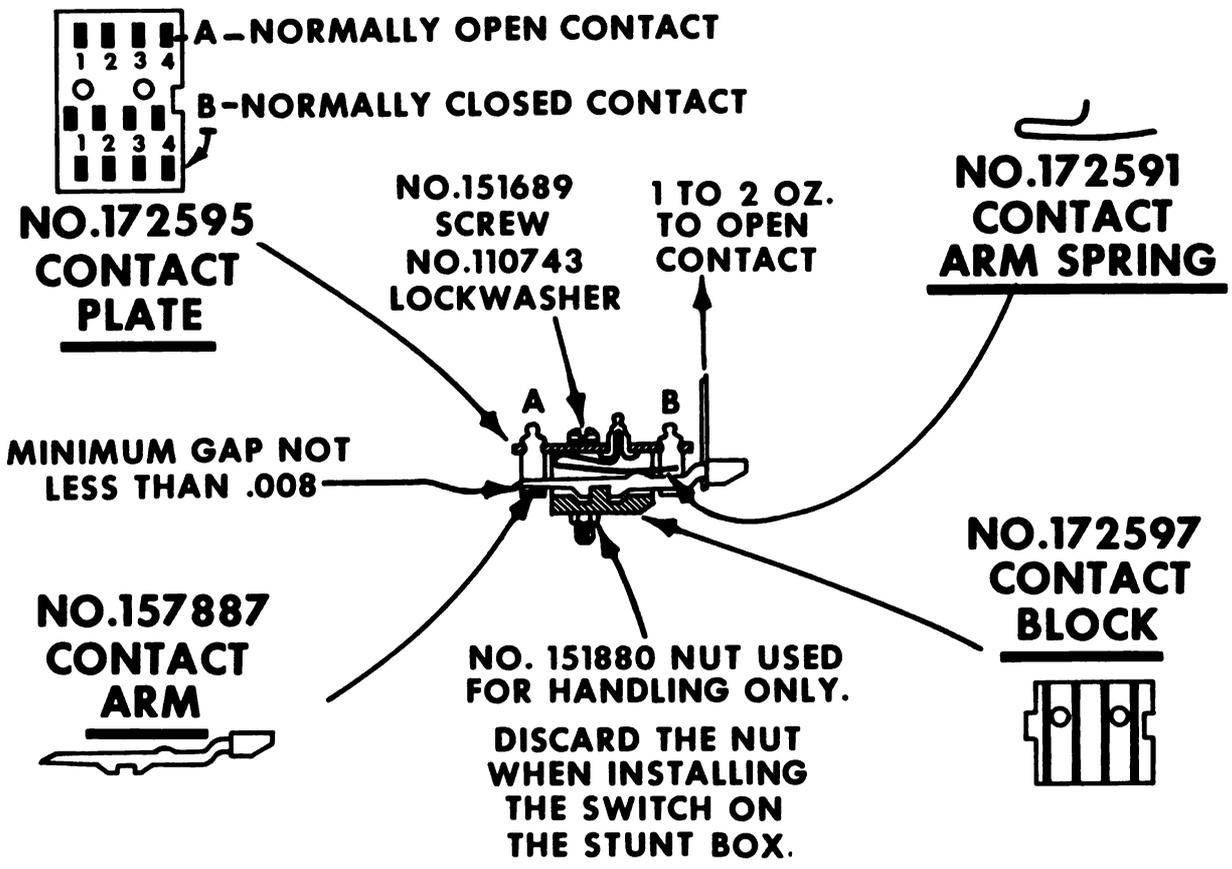
Paul R. Colby.

Paul R. Colby, AF-130

Attachment

Sketch No. SK-B-135-4,
6-28-60

NO.172525 SWITCH ASSEMBLY FUNCTION BOX



| SWITCH ASSEMBLY PART NO. | CONTACT PLATE ASSEMBLY NO. | CONTACT ARM POSITION | | | |
|--------------------------|----------------------------|----------------------|---------|---------|---------|
| | | 1 | 2 | 3 | 4 |
| 172,525 | 172,595 | 157,887 | 157,887 | 157,887 | 157,887 |

SK-B-135-4
6-28-60



6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 21.

November 2, 1960

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER TYPE 28(10) - EEM NO. 606

TO : Chief, Facilities and Materiel Field
Division Nos. 1-4
Regional Manager, Regions 5 & 6

FROM : Chief, Maintenance Engineering Branch, FM-130

SUBJECT: Perforator-Transmitter Base - IAK6XL; Character Counter Code Bar

1. OBJECT:

1.01 To equip all M28 Perforator-Transmitter Bases, Code IAK6XL (and earlier, lower numbered sub-codes), with a Character Counter Code Bar that will provide character count on BLANK signal combination in accordance with standard FAA requirements for the Weather Keyboard arrangement.

2. REASON FOR MODIFICATION:

2.01 In development of the new Model 28 ASR sets, the provision for character count on the BLANK signal combination was overlooked. This results in tape perforation based on an incorrect character count, with consequent printing pile-up at the right-hand margin of page copy. This modification corrects that situation in accordance with Air Traffic Management requests.

3. APPLICATION:

3.01 This modification replaces the Part No. 158107 Character Counter Code Bar by Part No. 174350 Character Counter Code Bar on all Perforator-Transmitter Bases, IAK6XL, a part of the Model 28 ASR (Automatic Send-Receive Set). All IAK6XL and earlier, units shall be so modified. Future procurement will provide ASR sets having the new Character Counter Code Bar. The new ASR Sets, not requiring this modification, can be identified by examining the Perforator-Transmitter Base code, which will be "IAK" followed by a number higher than 6, for example, IAK9XL.

4. REFERENCE:

4.01 Teletype Corporation Bulletin No. 1169B - Parts, Model 28 Automatic Send Receive Set (ASR).

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER TYPE 28(10) - KEM NO. 606

4.02 Teletype Corporation Bulletin No. 250B - Adjustments M28 ASR Set.

4.03 Teletype Corporation Specification 5873S.

5. **MATERIAL REQUIRED:**

5.01 Teletype Corporation Part No. 174350 Character Counter Code Bar.

6. **SOURCE OF MATERIALS:**

6.01 OMB stock.

7. **TOOLS AND EQUIPMENT REQUIRED:**

7.01 Standard teletypewriter tools.

8. **WORK TO BE PERFORMED BY:**

8.01 Maintenance field personnel, on all equipment in the system.

9. **WHEN MODIFICATION IS TO BE PERFORMED:**

9.01 Commencing January 3, 1961, but not to interfere with the 100WPM AC&O implementation. Parts will be in stock under OMB by November 1, 1960.

10. **ESTIMATED TIME REQUIRED:**

10.01 Four hours per unit. (Total system units, approximately 3,500)

11. **DISPOSITION OF SURPLUS PARTS:**

11.01 Discard as junk, the Part No. 158107 Character Counter Code Bar.
The 158107 shall not be used in the system under any circumstances.

12. **MODIFICATION PROCEDURE:**

12.01 Remove Perforator-Transmitter Base from the IAAC206 Cabinet.
Refer to Specification 5873S.

12.02 Remove the Signal Generator Assembly from the base to allow access.

12.03 Remove the Character Counter Assembly from the base.

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER TYPE 28(10) - EEM NO. 606

- 12.04 Unhook the 2415 Springs, Code Bar, from the 154013 Spring Bracket, which is located at the right-hand end of the Code Bar Mechanism (see 1169B page 1.8 showing Code Bar Mechanism).
 - 12.05 Loosen the two 151630 adjustment screws on the 154068 Bracket, Code Bar Lever Guide (right), and the two 151630 adjustment screws on the 154069 Bracket, Code Bar Lever Guide (left).
 - 12.06 Lift the right and left 154008 Guides, Code Bar, to the top limit of their adjustment slots.
 - 12.07 The 158107 Character Counter Code Bar is in the first slot, viewed from the front of the Base. Move the 158107 Code Bar to the right, which will free it from the left-hand 154008 Guide, Code Bar. Lift the 158107 slightly and move it to the left until it is free from the right-hand 154008 Guide, Code Bar. Remove and discard the 158107.
 - 12.08 Insert the new, 174350 Character Counter Code Bar and complete the installation by following the above seven paragraphs in reverse order.
 - 12.09 Check the complete chain of related adjustments covered in Bulletin 250B.
 - 12.10 Check the assembled teletypewriter ASR set in operation, and ascertain that character counting now covers the BLANK signal combination.
13. **TEST AFTER INSPECTION:**
 - 13.01 Check on-line operation of ASR set after reassembly and preliminary checks.
 14. **USE:**
 - 14.01 FAA system-wide, without exception, on all M28 ASR sets.
 15. **RESULTS OF MODIFICATION:**
 - 15.01 Character count will be provided on the BLANK signal combination when attendant is perforating tape.

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER TYPE 28(10) - EEM NO. 606

16. **CORRECTIONS TO DRAWINGS:**

16.01 None.

17. **CORRECTIONS TO INSTRUCTIONS:**

17.01 Insert a copy of this EEM into Parts Bulletin 1169B temporarily.
(Teletype Corporation will later issue a revised bulletin page to cover.)

18. **CORRECTIONS TO FORM 198 and FAA-416:**

18.01 Not applicable to Form 198.

18.02 Enter under remarks on Form FAA-416: "Modified in accordance with EEM No. 606."

19. **COORDINATION:**

19.01 This modification has been coordinated with the Communications Engineering Branch and Air Traffic Management.

20. **IMPLEMENTATION:**

20.01 This modification is planned for as prompt implementation as possible without causing interference with the 100WEM AC&O Program.

for 
Richard C. Young, FM-130

The need for this modification was reported by the Maintenance Engineering Branch, Region Three.

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

January 18, 1961

CHAPTER 22.

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER - MODEL 14 XD (3) -
EEM NO. 609

TO : Chief, Facilities and Materiel Field
Division Nos. 1-4
Regional Manager, Regions 5 & 6

FROM : Chief, Maintenance Engineering Branch, FM-130

SUBJECT: Model 14 Transmitter Distributor - XD247AB/HJ; Pulse-Per-Character
Contact Mechanism

1. OBJECT:

1.1 To equip the FAA standard Model 14 Transmitter Distributor (code XD247AB/HJ per DR-D-40052-1) with the Pulse-Per-Character Contact Mechanism for supplying synchronizing pulses to an external marker.

2. REASON FOR MODIFICATION:

2.1 To provide the Pulse-Per-Character Contact Mechanism required on a Transmitter Distributor associated with AMOS-3 (Automatic Meteorological Observing System) equipment.

3. APPLICATION:

3.1 This modification shall be applied to all Model 14 Transmitter Distributors provided for use with AMOS-3 equipment. At present the U. S. Weather Bureau provides the automatic meteorological equipment while the FAA furnishes all teletypewriter equipment necessary to operate with the data handling circuits.

4. REFERENCE:

4.1 Teletype Corporation Publications:

(a) 1095B - Parts, Model 14 Transmitter Distributor; see page 11 covering the 84593 (which is similar to 139746 Set of Parts to be used).

(b) 141B - Adjustments, Model 14 Transmitter Distributor.

**ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER - MODEL 14 XD (3) -
EEM NO. 609**

4.2 Circuit Description and Drawing numbered DR-D-40052-1, entitled, "Teletypewriter Station Model 14XD Arranged for Automatic Service (XD247AB/HJ)", forwarded as an attachment to FM-340 Memorandum to all Regions, dated April 27, 1959.

5. **MATERIAL REQUIRED:**

5.1 Teletype Corporation Part No. 139746 Set of Parts. (This is similar to the Part No. 84593 Set of Parts but provides Contact Form 1A instead of Form 1B as does the 84593 Modification Kit.)

6. **SOURCE OF MATERIALS:**

6.1 QMB Stock.

7. **TOOLS AND EQUIPMENT REQUIRED:**

7.1 Standard teletypewriter tools.

8. **WORK TO BE PERFORMED BY:**

8.1 Establishment installation field parties.

9. **WHEN MODIFICATION IS TO BE PERFORMED:**

9.1 At the time of AMOS-3 equipment utilization requirement.

10. **ESTIMATED TIME REQUIRED:**

10.1 Two hours per Model 14 Transmitter Distributor Set.

11. **DISPOSITION OF SURPLUS PARTS:**

11.1 None.

12. **MODIFICATION PROCEDURE:**

12.1 Remove and retain the 77068 Plate.

12.2 Mount the 139746 contact assembly using two 80342 screws, two 2191 lock washers, and one 70699 washer, flat.

**ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER - MODEL 14 XD (3) -
EEM NO. 609**

- 12.3 Mount the 84597 spring bracket under the operating lever screw lock nut and lock washer. Hook the 70388 operating lever spring between this bracket and the post on the contact bracket.
- 12.4 Make the electrical connections shown in Drawing DR-D-40052-1, "Teletypewriter Station Model 14XD Arranged for Automatic Service (XD247AB/HJ)", and covered by the associated Circuit Description.
- 12.5 Adjustments:
- (a) Position the 84594 bracket and bend the contact springs so the contacts just close as the distributor brush enters the leading edge of the START-segment.
 - (b) The contacts shall remain closed as the brush passes over the START and segments 1 through 5 shall open after entering the leading edge of the STOP-segment.
 - (c) Contact separation in the "open", i.e., stop position of the distributor, shall be Min. .010".
- 12.6 Recheck related adjustments in Bulletin 141B.
- 12.7 Replace the 77068 Base Plate.
13. TEST AFTER INSPECTION:
- 13.1 Check operation in conjunction with associated AMOS-3 equipment.
14. USE:
- 14.1 At AMOS-3 stations. (Also for any fully automatic system employment.)
15. RESULTS OF MODIFICATION:
- 15.1 The modified transmitter distributor can be used in either normal or fully automatic service.
16. CORRECTION TO DRAWINGS:
- 16.1 None. DR-D-40052-1 applies.

**ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER - MODEL 14 XD (3) -
EEM NO. 609**

17. CORRECTION TO INSTRUCTIONS:

17.1 Add the Adjustment Procedures listed under Paragraph 12.5 above to "Teletype" Adjustment Bulletin No. 141B. (The standard bulletin does not cover the adjustments for this special set of parts.)

18. CORRECTIONS TO FORM 198 and FAA-416:

18.1 Not applicable to Form 198.

18.2 Enter under remarks on Form FAA-416: "Modified in accordance with EEM NO. 609".

19. COORDINATION:

19.1 This modification has been coordinated with FM-347 and the U. S. Weather Bureau.

20. IMPLEMENTATION:

20.1 This modification is planned for facilitating AMOS-3 installations in the regions and maintaining standard serving company loop specifications.

Paul R. Colby
for Richard C. Young, FM-130

Attachments - 3

1. Sketch SK-A-135-8
2. Circuit Description DR-D-40052-1
3. Drawing DR-D-40052-1

6170.1
1/14/69

**CIRCUIT DESCRIPTION
TELETYPEWRITER SYSTEMS**

DR-D-40052-1
11/3/58
REV/5/22/59

**TELETYPEWRITER STATION
MODEL 14 XD ARRANGED FOR
AUTOMATIC SERVICE
(XD247AB/HJ)**

1. PURPOSE OF CIRCUIT

1.01 This internal circuit arrangement of the XD provides for its employment under modern automatic switching conditions. Specifically, means are provided to split electrically and control separately the transmitter function and the distributor function.

1.02 Use of this circuit arrangement allows the distributor to accept five-wire input from external transmitters or markers, and the transmitter to function as a five-wire reader as well as cooperate with an external distributor if desired. An auxiliary pulse is available for insuring synchronisation with external system components.

1.03 The XD can still be used as a standard message transmitter distributor but requires a special 32-point slip connector on the associated mounting plate assembly in order to accommodate the additional leads that must be brought out externally to the system.

2. WORKING LIMITS

2.01 The maximum external resistance of the control leads from the XD shall be kept at a minimum so that 48 volt operating potential is available. This presents no problem under the conditions for which this circuit was designed, where the transmitter distributor (XD) and associated system components are within the same switching office area with the control leads extended by 19-22 gauge cable pairs.

3. FUNCTIONS

3.01 To act as:

- (1) single-channel message tape transmitter distributor
- (2) 5-wire tape reader (transmitter)
- (3) 5-wire (multi-wire) distributor.

3.02 To provide for synchronisation with external components of the teletypewriter system.

4. CONNECTING CIRCUITS

4.01 Teletype Corporation Drawings:

- (1) 3463WD - Schematic Wiring Diagram Transmitter Control Modification Kit.

- (2) 3464WD - Actual Wiring Diagram Transmitter Control Modification Kit with Reperforator Transmitter Control.
- (3) 3533WD - Actual Wiring Diagram AC273 Cabinet (designed to mount either LBXD4 or Model 14 XD).
- (4) 3534WD - Schematic Wiring Diagram AC273 Cabinet (designed to mount either LBXD4 or Model 14 XD).
- (5)
- (6)

4.02 FAA Drawings:

- (1) DR-D-40053-1 - AC273 Apparatus Cabinet Arranged for use with Model 14 XD
- (2) DR-D-40053-2 - AC273 Apparatus Cabinet Arranged for use with Model 14 XD (BASOPS)
- (3) DR-D-40056-1 - Teletypewriter Station Code Directing Character Marker Relay Group
- (4) DR-E-40026-1-4 Teletypewriter Systems, Station Terminal Circuits Line Monitor and Send Control
- (5)
- (6)
- (7)

DESCRIPTION OF OPERATION (STATIC)

5. GENERAL

5.01 This circuit consists of the Model 14 Transmitter Distributor, XD, equipped and wired as shown in Drawing DR-D-40052-1. All internal control and line leads are brought out separately through a 32-point slip connection assembly. Operating connections to suit the variegated demands of the teletypewriter system must, therefore, be provided externally at a terminal strip on the associated apparatus cabinet employed for mounting.

6. STANDBY CONDITION OF CIRCUIT

6.01 In the standby or normal condition of the circuit when no signals are being transmitted and no tape is in the tape gate:

- (1) distributor DTR is at rest in the stop position
- (2) transmitter contacts XMT are on the spacing position
- (3) the motor is not operating
- (4) tape-out contacts TO are open
- (5) Tight-tape contacts TT are closed
- (6) Tape-control switch (not used for automatic service) is open
- (7) tape-feed-withhold magnet TFW is not operated
- (8) sense clutch magnet SNS is not operated
- (9) pulse-per-character (auxiliary) contacts PPC1-2 are held open by the operating lever.

7. SINGLE CHANNEL TRANSMITTER DISTRIBUTOR USE

7.01 Auxiliary contacts PFC and tape-feed-withhold magnet TFW are not used (and may not be present). Tape control switch TC may or may not be used, depending upon system requirements. FAA system practice as of date of this circuit description issue is not to use TC since starting and stopping of tape transmission is in response to circuits per DR-E-40026-1-4. When TC is not used, connection to SNS is via SC terminal 29 rather than 26.

7.02 External connections (see associated system and job drawings) are established as follows:

(1) SC terminals

| | | |
|----|---|------------|
| 1 | - | Line |
| 2 | - | " |
| 3 | - | A-C |
| 24 | - | " |
| 7 | - | Strap to 1 |
| 21 | - | " " 14 |
| 20 | - | " " 13 |
| 19 | - | " " 12 |
| 18 | - | " " 11 |
| 17 | - | " " 10 |

(2) Provide a tape control circuit loop with SNS, TT, TO in series or as required by the particular application (see associated system and job drawings).

8. 5-WIRE TAPE READER USE

8.01 Auxiliary contacts PPC are used and must be present. Tape control switch TC may or may not be used depending upon the particular job requirements.

8.02 External connections (see associated system and job drawings) are established as follows:

(1) SC terminals

| | | | |
|----|---|---|----------|
| 1 | - | XMR | Common |
| 17 | - | " | Pulse #5 |
| 18 | - | " | " 4 |
| 19 | - | " | " 3 |
| 20 | - | " | " 2 |
| 21 | - | " | " 1 |
| 5 | - | Pulse-per-character PPC(for external synchronisation) | |
| 6 | - | " | " " " |
| 3 | - | A-C | |
| 24 | - | " | |

(2) Provide a tape control circuit loop with SNS, TT, TO as required by the particular application (see associated system and job drawings).

9. 5-WIRE DISTRIBUTOR USE

9.01 Auxiliary contacts PPC and tape-feed-withhold magnet TFW are used and must be present. Tape control switch TC is not used.

9.02 External connections (see associated system and job drawings) are established as follows:

(1) SC terminals

- 2 - DTR Common
- 10 - " Pulse #5
- 11 - " " 4
- 12 - " " 3
- 13 - " " 2
- 14 - " " 1
- 7 - " " STOP
- 5 - Pulse-per-character PPC (for external synchronization)
- 6 - " " " " " "
- 3 - A-C
- 24 - "
- 15 - Tape-feed-withhold magnet TFW
- 16 - " " "

(2) Provide a tape control circuit loop with SNS, TT, TO as required by the particular application (see associated system and job drawings).

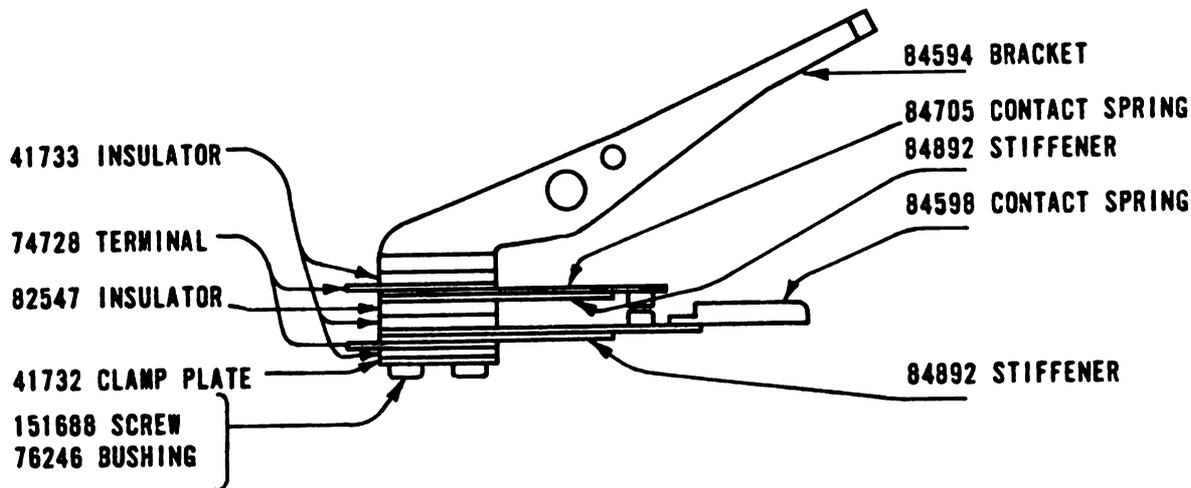
10. DYNAMIC OPERATION

10.01 Since XD dynamic operation is dependent upon external automatic control circuitry, such operation is outlined in circuit descriptions supplied with drawings covering such related circuitry.

11. CONCLUSION

11.01 This circuit arrangement represents the FAA automatic system standard to be employed throughout the teletypewriter system, whatever the application.

EEM-609

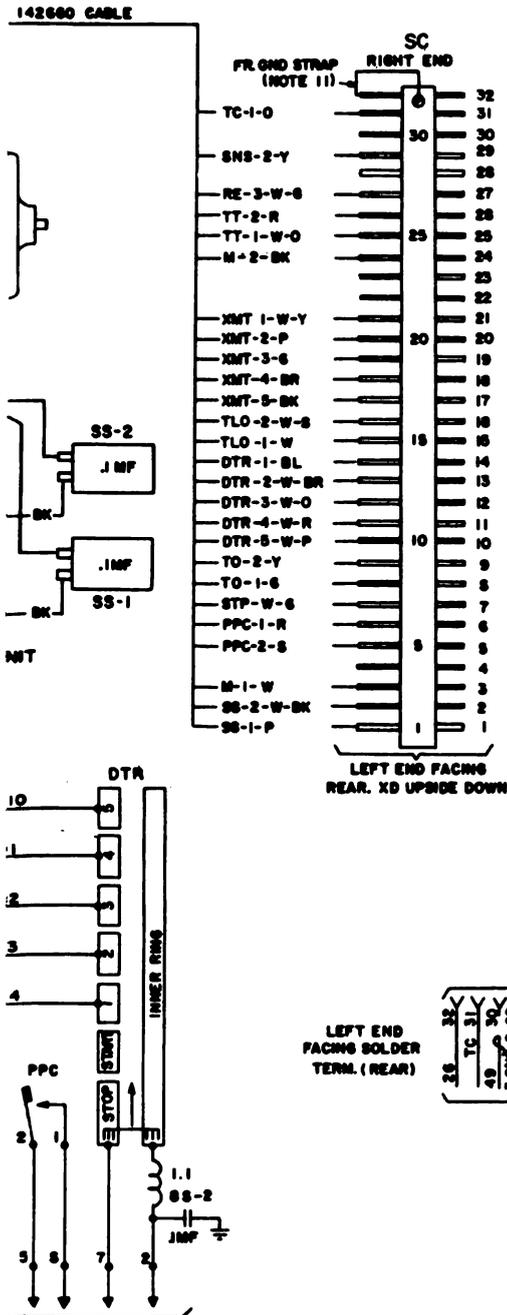


139746 CONTACT ASSEMBLY

PULSE PER CHARACTER (PPC)

SK-A-135-8
10-28-60

FIG 2
ACTUAL



NOTES:

- 1- RESISTANCE OF COILS AND RESISTORS SHOWN IN OHMS.
- 2- SEE LEGEND FOR FUNCTIONAL DESIGNATION.
- 3- XD EQUIP. W/113772 MOD. KIT (STEEL CL. 100 WPM)
- 4- PPC & TLO NOT PROVIDED UNLESS REQUIRED. WHERE MISSING, FOLD LEADS BACK AND TAPE.
- 5- RUBBER STAMP EVERY FIFTH TERM. ON "SC" AS SHOWN.
- 6- "re" SHOWN FOR 48V.D-C SNS OPERATION: 0.195 AMP, 0.020 SECONDS OPERATING TIME. FOR 110V A-C STRAP "re" TERMS. 1-2. FOR 110V D-C "re" IS NOT STRAPPED.
- 7- COVER LEADS AT "re" TERMS. WITH HIGH TEMP. TUBING. 60024 RM FOR NO. 20 WIRE, 80025 RM FOR NO. 18 WIRE.
- 8- PPC SHOWN OPERATED (STOP POSITION). CONTACT 1 IS CLOSEST TO 84594 BRACKET.
- 9- FIG. 3 IS TOP VIEW OF 32 POINT RECEPTACLE PART NO. 142708 REPLACING 77125 CONTACT ASSEM. ON 115932 MTR PLATE ASSEM. SHORTING CONTACTS ARE SHOWN IN MODIFICATION POSITION.
- 10- PART NO. 143129 COVERS XD247AB/HJ NAME PLATE.
- 11- STRAP IS NOT PART OF 142660 CABLE. USE NO. 13 BLACK FLEXIBLE CONDUCTOR.
- 12- USE 70368 SPRING.

SYMBOLS

- SPliced AND TAPed
- FOLDED AND TAPed
- INDICATES PAIR.
- TRML ON 32-PT BASE CONNECTOR (FIG. 3)
- TRML ON 32-PT XD CONNECTOR (SC) (FIG. 2)
- INDICATES HOLE THRU BASE

LEGEND

| DESIGNATION | FUNCTION | TELETYPE PART NO. |
|-------------|---------------------------|--|
| DTR | DISTRIBUTE CONTACTS | 77070 DISC |
| M | MOTOR (NOTE 3) | 113396 ARR'GT "H" |
| SNS | SENSE CLUTCH MAGNET | 199 M MAGNET |
| SS1 | SPARK SUPPRESSION 1 | 92217 FILTER ASSEMBLY |
| SS2 | SPARK SUPPRESSION 2 | |
| TC | TAPE CONTROL SWITCH | 107393 SWITCH |
| TPW | TAPE FEED WITHHOLD MAGNET | 97460 TAPE STOP MAGNET 190M (INCLUDED IN MOD. KIT 10096)(NOTE 4) |
| TO | TAPE-OUT CONTACTS | 97467 TAPE-OUT CTC |
| XMT | TRANSMITTING CONTACTS | 128618 CTC ASSEM. |
| TT | THIN-TAPE CONTACTS | 77079 TAPE STOP ASSEM. |
| PPC | PULSE-PER-CHARACTER CTCs | 139746 CONTACT (ASSEMBLY NOTE 4) ALK |
| SC | SLIP CONNECTION | 113912 TRML BLOCK ASSEM. |
| RE | RESISTANCE | 86951 RESISTOR |

TO FIG. 1



SEE DR. D-40053-1

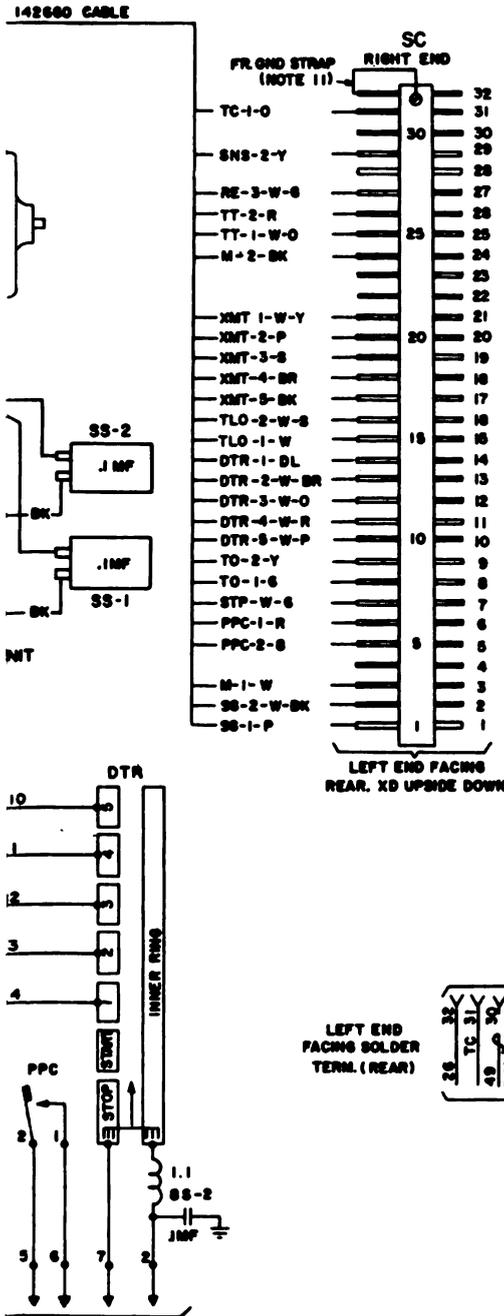
FIG. 3
XD MOUNTING PLATE (ASSEM)

KEM # 609

| | |
|--|--------------|
| FEDERAL AVIATION AGENCY COMMUNICATIONS CENTER | |
| TELETYPEWRITER SYSTEMS MODEL 14 XD ARRANGED FOR AUTOMATIC SERVICE (XD247AB/HJ) | |
| calc. <i>JKX</i> | DR D-40052-1 |

| | |
|--|--------|
| B TC-1 RE-CONNECTED TO SC-31 | 8/2/69 |
| C ADDED FR. GND STRAP TERM 32 | 8/2/69 |
| D FIG. 3 AC 273 CAS TERMS CONNECTED | 8/2/69 |
| A CONNECTED FIG. 1 TO SHOW XMT SPACE CONTACTS COMMON | 8/2/69 |

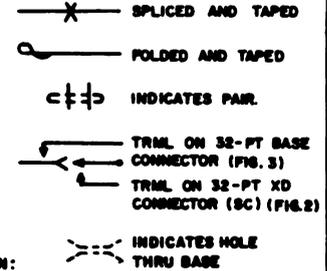
FIG 2
ACTUAL



NOTES:

- 1- RESISTANCE OF COILS AND RESISTORS SHOWN IN OHMS.
- 2- SEE LEGEND FOR FUNCTIONAL DESIGNATION.
- 3- XD EQUIP. W/113772 MOD. KIT (STEEL CL. 100 WPM)
- 4- PPC & TLO NOT PROVIDED UNLESS REQUIRED. WHERE MISSING, FOLD LEADS BACK AND TAPE.
- 5- RUBBER STAMP EVERY FIFTH TERM. ON "SC" AS SHOWN.
- 6- "RE" SHOWN FOR 48V.D-CNSG OPERATION: 0.195 AMP, 0.020 SECONDS OPERATING TIME. FOR 110V A-C STRAP "RE" TERMS 1-2. FOR 110V D-C "RE" IS NOT STRAPPED.
- 7- COVER LEADS AT "RE" TERMS WITH WSH TEMP. TURNING. 60024 RM FOR NO. 20 WIRE, 60025 RM FOR NO. 18 WIRE.
- 8- PPC SHOWN OPERATED (STOP POSITION). CONTACT 1 IS CLOSEST TO 84894 BRACKET.
- 9- FIG. 3 IS TOP VIEW OF 32 POINT RECEPTACLE PART NO. 142708 REPLACING 77128 CONTACT ASSEM. ON 118932 MTS PLATE ASSEM. SHORTING CONTACTS ARE SHOWN IN MODIFICATION POSITION.
- 10- PART NO. 143128 COVERS XD247AB/HJ NAME PLATE.
- 11- STRAP IS NOT PART OF 142680 CABLE. USE NO. 18 BLACK FLEXIBLE CONDUCTOR.
- 12- USE 70388 SPRING.

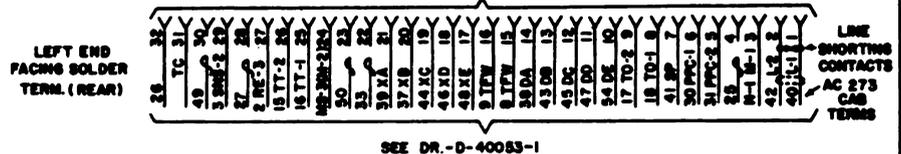
SYMBOLS



LEGEND

| DESIGNATION | FUNCTION | TELETYPE PART NO |
|-------------|---------------------------|--|
| DTR | DISTRIBUTE CONTACTS | 77070 DISC |
| M | MOTOR (NOTE 3) | 113396 ARR'S T "H" |
| SNS | SENSE CLUTCH MAGNET | 198 M MAGNET |
| SS1 | SPARK SUPPRESSION 1 | 92217 FILTER ASSEMBLY |
| SS2 | SPARK SUPPRESSION 2 | |
| TC | TAPE CONTROL SWITCH | 107393 SWITCH |
| TPW | TAPE FEED WITHHOLD MAGNET | 97460 TAPE STOP MAGNET 190M (INCLUDED IN MOD. KIT 10894)(NOTE 4) |
| TO | TAPE-OUT CONTACTS | 97467 TAPE-OUT CTC |
| XMT | TRANSMITTING CONTACTS | 128818 CTC ASSEM. |
| TT | TIME-TAPE CONTACTS | 77079 TAPE STOP ASSEM. |
| PPC | PULSE-PER-CHARACTER CTCs | 139746 CONTACT (ASSEM)(NOTE 4) ALK |
| SC | SLIP CONNECTION | 113812 TRML BLOCK ASSEM. |
| RE | RESISTANCE | 86951 RESISTOR |

TO FIG. 1



SEE DR.-D-40053-1

FIG. 3
XD MOUNTING PLATE (ASSEM)

KEM # 609

FEDERAL AVIATION AGENCY
COMMUNICATIONS SYSTEMS DIVISION

| | |
|--|------------|
| TELETYPEWRITER SYSTEMS MODEL 14 XD ARRANGED FOR AUTOMATIC SERVICE (XD247AB/HJ) | |
| DATE: 1/14/69 | BY: J.N.K. |
| DR D-40052-1 | 9-30-68 |

| | |
|--|---------|
| D TC-1 RE-CONNECTED TO SC-31 | 8/25/68 |
| C ABOVE PR. SNS STRAP TERM 32 | 8/25/68 |
| B FIG. 3 AC 275 CAS TERMS CONNECTED | 8/19/68 |
| A CONNECTED FIG. 1 TO SHOW XMT SPACE CONTACTS COMMON | 8/25/68 |

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FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 23.

November 2, 1960

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER - MODEL 14 XD(4) -
EEM NO. 610

TO : Chief, Facilities and Materiel Field
Division Nos. 1-4
Regional Manager, Regions 5 & 6

FROM : Chief, Maintenance Engineering Branch, FM-130

SUBJECT: Model 14 Transmitter Distributor - XD247AB/HJ; Tape Feed Withhold
Feature

1. OBJECT:

1.1 To equip the FAA standard Model 14 Transmitter Distributor (Code XD247AB/HJ per DR-D-40052-1) with the Tape Feed Withhold Feature for use with five-wire input from an external signal source.

2. REASON FOR MODIFICATION:

2.1 To provide the Tape Feed Withhold Feature required on a Transmitter Distributor associated with AMOS-3 (Automatic Meteorological Observing System) equipment.

3. APPLICATION:

3.1 This modification shall be applied to all Model 14 Transmitter Distributors provided for use in 5-wire distributor service with AMOS-3 equipment. At present the U. S. Weather Bureau provides the automatic meteorological equipment while the FAA furnishes all teletypewriter equipment necessary to operate with the data handling circuits.

4. REFERENCE:

4.1 Teletype Corporation Publications:

(a) 1095B - Parts, Model 14 Transmitter Distributor; see page 11 covering the 105056 Adjustable Tape Guide Assembly and 97460 Tape Stop Magnet Assembly. (These two assemblies comprise the 106916 Set of Parts.)

**ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER - MODEL 14 XD(4) -
EEM NO. 610 - NOVEMBER 2, 1960**

(b) 106916 Check List - (provided with Set of Parts)

(c) 141B - Adjustments, Model 14 XD.

4.1 Circuit Description and Drawing numbered DR-D-40052-1, entitled, "Teletypewriter Station Model 14 XD Arranged for Automatic Service (XD247AB/HJ)", forwarded as an attachment to FM-340 Memorandum to All Regions, dated April 27, 1959.

5. MATERIAL REQUIRED:

5.1 Teletype Corporation Part No. 106916 Set of Parts. (Part No. 136149, Modification Kit can be used, discarding the unnecessary parts.)

6. SOURCE OF MATERIALS:

6.1 PMB Stock.

7. TOOLS AND EQUIPMENT REQUIRED:

7.1 Standard teletypewriter tools.

8. WORK TO BE PERFORMED BY:

8.1 Establishment installation field parties.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 At the time of AMOS-3 equipment utilization requirement.

10. ESTIMATED TIME REQUIRED:

10.1 Two hours per Model 14 Transmitter Distributor Set.

11. DISPOSITION OF SURPLUS PARTS:

11.1 Leave with station personnel as spare parts for standard transmitter distributors, those parts removed in this modification.

12. MODIFICATION PROCEDURE:

12.1 Remove and retain the 80473 Cover, 77068 Base Plate, and 103182 Snap Cover.

**ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER - MODEL 14 XD(4) -
EEM NO. 610**

- 12.2 Loosen the 1164 Screw on the 77004 Bracket, move the 125828 Lever Shaft forward until the 125829 Feed Lever is free in its slot. Unhook the 4708 Feed Pawl Spring from the 9520 Terminal Block Assembly. Disengage the 125858 Feed Pawl from the feed wheel ratchet. Remove the 125829 Feed Lever from the unit. Remove and retain the 4708 Feed Lever Spring.
- 12.3 Install the 97453 Feed Pawl on the 97452 Feed Lever using the 112622 Shoulder Screw. Install the 70466 Spring on the feed pawl and feed lever. Place the 4708 Spring on the feed lever. Install feed lever in the unit; reverse procedure used in disassembly.
- 12.4 Install the 97460 Tape Stop Magnet assembly beneath the 97453 Feed Pawl. Secure it to the unit casting using two 1159 Screws, 3640 Lock Washers, and 125011 Flat Washers, provided.
- 12.5 Make the electrical connections shown in Drawing DR-D-40052-1, "Teletypewriter Station Model 14 XD Arranged for Automatic Service (XD247AB/HJ)", and covered by the associated Circuit Description.
- 12.6 Adjustments:

Refer to Bulletin 141B for standard adjustments. Make the following additional adjustments:

- (1) Armature Air Gap: When the armature is released, the air gap measured at the top edge of the core, shall be Min. .030", Max. .040". See SKETCH SK-A-135-7.
 - (a) To Adjust: Reposition the armature backstop screw.
- (2) Blocking Plate: With the magnet energized and with the operating lever roller on the low part of the cam--the feed pawl in its extreme upward position--the clearance between the top edge of the blocking plate and the bottom surface of the feed pawl extension shall be Min. .004", Max. .010", when all the play is taken up to make this clearance a minimum. See SKETCH SK-A-135-6.
 - (a) To Adjust: Position blocking plate.

**ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER - MODEL 14 XD(4) -
EEM NO. 610**

(3) Magnet Bracket Position: With the armature released there shall be some clearance, not more than .012, at the point of minimum clearance between the end of the feed pawl extension and the side of the blocking plate as the feed lever is moved downward, and no interference between these parts as the feed lever is moved upward after completing a downward stroke. To gauge, turn motor by hand and determine points of minimum clearance as the feed lever is lowered and raised.

(a) To Adjust: Relocate the magnet bracket by means of its mounting screws.

12.7 Recheck related adjustments in Bulletin 141B.

12.8 Replace the 80473 Cover, 77068 Base Plate, and 103182 Snap Cover.

13. TEST AFTER INSPECTION:

13.1 Check operation in conjunction with associated AMOS-3 equipment.

14. USE:

14.1 At AMOS-3 stations. (Also for any 5-wire distributor utilization of the Model 14 XD--See associated Circuit Description.)

15. RESULTS OF MODIFICATION:

15.1 The modified transmitter distributor can be used in either 5-wire or 2-wire service.

16. CORRECTION TO DRAWINGS:

16.1 None, DR-D-40052-1 applies.

17. CORRECTIONS TO INSTRUCTIONS:

17.1 Add the Adjustment Procedures listed under paragraph 12.6 above to "Teletype" Adjustment Bulletin No. 141B. (The standard bulletin does not cover the adjustments for this special set of parts.)

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- 5 -

**ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER - MODEL 14 XD(4) -
EEM NO. 610**

18. CORRECTIONS TO FORM 198 AND FAA-416 DATA:

18.1 Not applicable to Form 198.

18.2 Enter under remarks on Form FAA-416: "Modified in accordance with
EEM No. 610".

19. COORDINATION:

19.1 This modification has been coordinated with FM-347 and the U. S.
Weather Bureau.

20. IMPLEMENTATION:

20.1 This modification is planned for facilitating AMOS-3 installations
in the regions and maintaining standard serving company loop
specifications.

for 
Richard C. Young, FM-130

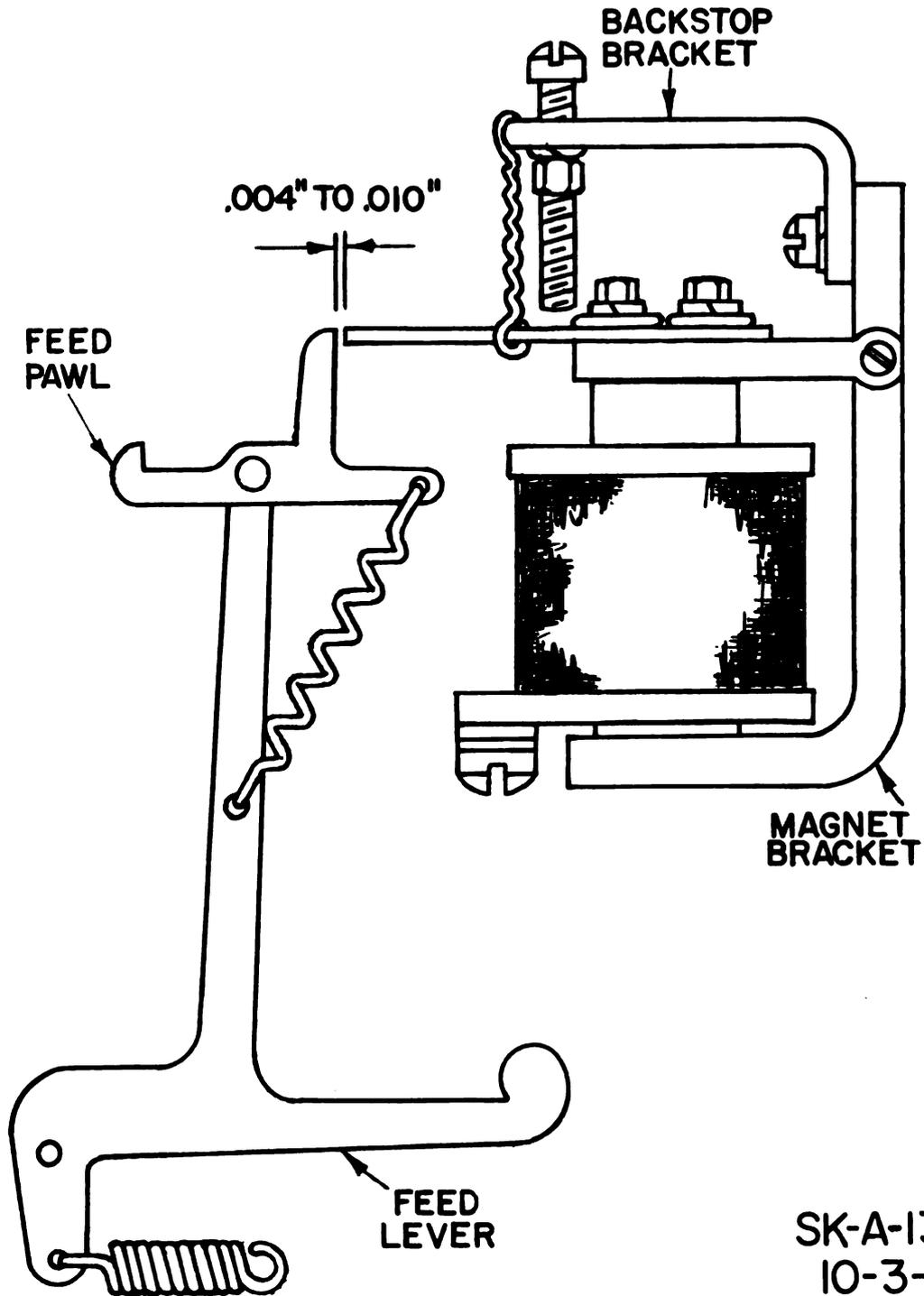
Attachments - 4

Sketch SK-A-135-6

Sketch SK-A-135-7

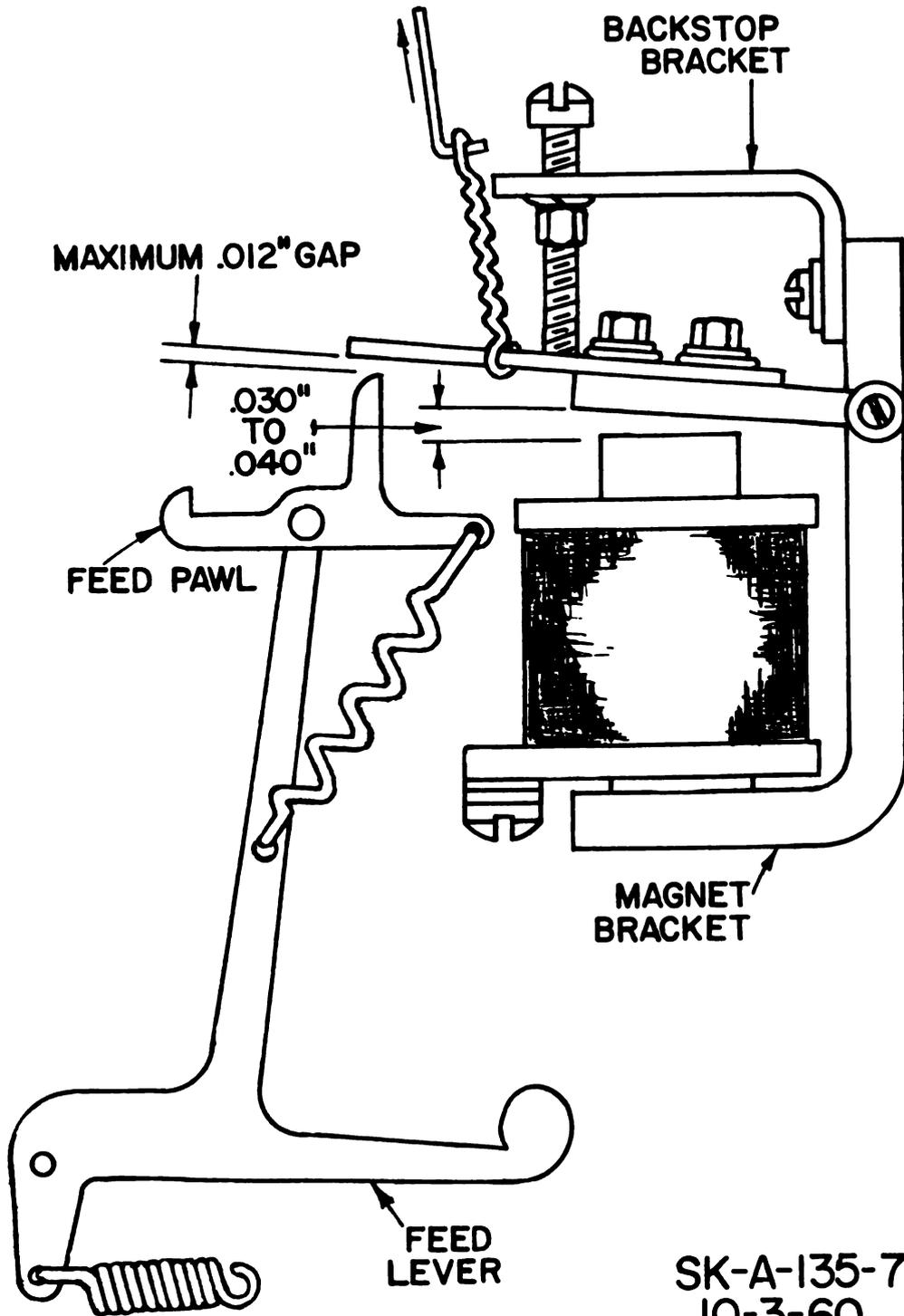
Circuit Description DR-D-40052-1

Drawing DR D-40052-1



SK-A-135-6
10-3-60

1½" TO 3 OZS. TO PULL
TO POSITION LENGTH



SK-A-135-7
10-3-60

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**CIRCUIT DESCRIPTION
TELETYPEWRITER SYSTEMS**

DR-D-40052-1
11/3/58
REV/5/22/59

**TELETYPEWRITER STATION
MODEL 14 XD ARRANGED FOR
AUTOMATIC SERVICE
(XD247AB/HJ)**

1. PURPOSE OF CIRCUIT

1.01 This internal circuit arrangement of the XD provides for its employment under modern automatic switching conditions. Specifically, means are provided to split electrically and control separately the transmitter function and the distributor function.

1.02 Use of this circuit arrangement allows the distributor to accept five-wire input from external transmitters or markers, and the transmitter to function as a five-wire reader as well as cooperate with an external distributor if desired. An auxiliary pulse is available for insuring synchronisation with external system components.

1.03 The XD can still be used as a standard message transmitter distributor but requires a special 32-point slip connector on the associated mounting plate assembly in order to accommodate the additional leads that must be brought out externally to the system.

2. WORKING LIMITS

2.01 The maximum external resistance of the control leads from the XD shall be kept at a minimum so that 48 volt operating potential is available. This presents no problem under the conditions for which this circuit was designed, where the transmitter distributor (XD) and associated system components are within the same switching office area with the control leads extended by 19-22 gauge cable pairs.

3. FUNCTIONS

3.01 To act as:

- (1) single-channel message tape transmitter distributor
- (2) 5-wire tape reader (transmitter)
- (3) 5-wire (multi-wire) distributor.

3.02 To provide for synchronisation with external components of the teletypewriter system.

4. CONNECTING CIRCUITS

4.01 Teletype Corporation Drawings:

- (1) 3463WD - Schematic Wiring Diagram Transmitter Control Modification Kit.

- (2) 3464WD - Actual Wiring Diagram Transmitter Control Modification Kit with Reperforator Transmitter Control.
- (3) 3533WD - Actual Wiring Diagram AC273 Cabinet (designed to mount either LBXD₄ or Model 14 XD).
- (4) 3534WD - Schematic Wiring Diagram AC273 Cabinet (designed to mount either LBXD₄ or Model 14 XD).
- (5)
- (6)

4.02 FAA Drawings:

- (1) DR-D-40053-1 - AC273 Apparatus Cabinet Arranged for use with Model 14 XD
- (2) DR-D-40053-2 - AC273 Apparatus Cabinet Arranged for use with Model 14 XD (EASOPS)
- (3) DR-D-40056-1 - Teletypewriter Station Code Directing Character Marker Relay Group
- (4) DR-E-40026-1-4 Teletypewriter Systems, Station Terminal Circuits Line Monitor and Send Control
- (5)
- (6)
- (7)

DESCRIPTION OF OPERATION (STATIC)

5. GENERAL

5.01 This circuit consists of the Model 14 Transmitter Distributor, XD, equipped and wired as shown in Drawing DR-D-40052-1. All internal control and line leads are brought out separately through a 32-point slip connection assembly. Operating connections to suit the variegated demands of the teletypewriter system must, therefore, be provided externally at a terminal strip on the associated apparatus cabinet employed for mounting.

6. STANDBY CONDITION OF CIRCUIT

- 6.01 In the standby or normal condition of the circuit when no signals are being transmitted and no tape is in the tape gate:
- (1) distributor DTR is at rest in the stop position
 - (2) transmitter contacts XMT are on the spacing position
 - (3) the motor is not operating
 - (4) tape-out contacts TO are open
 - (5) Tight-tape contacts TT are closed
 - (6) Tape-control switch (not used for automatic service) is open
 - (7) tape-feed-withhold magnet TFW is not operated
 - (8) sense clutch magnet SNS is not operated
 - (9) pulse-per-character (auxiliary) contacts PPC1-2 are held open by the operating lever.

7. SINGLE CHANNEL TRANSMITTER DISTRIBUTOR USE

7.01 Auxiliary contacts PPC and tape-feed-withhold magnet TFW are not used (and may not be present). Tape control switch TC may or may not be used, depending upon system requirements. FAA system practice as of date of this circuit description issue is not to use TC since starting and stopping of tape transmission is in response to circuits per DR-E-40026-1-4. When TC is not used, connection to SNS is via SC terminal 29 rather than 28.

7.02 External connections (see associated system and job drawings) are established as follows:

(1) SC terminals

| | | |
|----|---|------------|
| 1 | - | Line |
| 2 | - | " |
| 3 | - | A-C |
| 24 | - | " |
| 7 | - | Strap to 1 |
| 21 | - | " " 14 |
| 20 | - | " " 13 |
| 19 | - | " " 12 |
| 18 | - | " " 11 |
| 17 | - | " " 10 |

(2) Provide a tape control circuit loop with SNS, TT, TO in series or as required by the particular application (see associated system and job drawings).

8. 5-WIRE TAPE READER USE

8.01 Auxiliary contacts PPC are used and must be present. Tape control switch TC may or may not be used depending upon the particular job requirements.

8.02 External connections (see associated system and job drawings) are established as follows:

(1) SC terminals

| | | |
|----|---|---|
| 1 | - | XMTR Common |
| 17 | - | " Pulse #5 |
| 18 | - | " " 4 |
| 19 | - | " " 3 |
| 20 | - | " " 2 |
| 21 | - | " " 1 |
| 5 | - | Pulse-per-character PPC(for external synchronisation) |
| 6 | - | " " " " |
| 3 | - | A-C |
| 24 | - | " |

(2) Provide a tape control circuit loop with SNS, TT, TO as required by the particular application (see associated system and job drawings).

9. 5-WIRE DISTRIBUTOR USE

9.01 Auxiliary contacts PPC and tape-feed-withhold magnet TFW are used and must be present. Tape control switch TC is not used.

9.02 External connections (see associated system and job drawings) are established as follows:

(1) SC terminals

- 2 - DTR Common
- 10 - " Pulse #5
- 11 - " " 4
- 12 - " " 3
- 13 - " " 2
- 14 - " " 1
- 7 - " " STOP
- 5 - Pulse-per-character PPC (for external synchronization)
- 6 - " " " " " "
- 3 - A-C
- 24 - "
- 15 - Tape-feed-withhold magnet TFW
- 16 - " " "

(2) Provide a tape control circuit loop with SNS, TT, TO as required by the particular application (see associated system and job drawings).

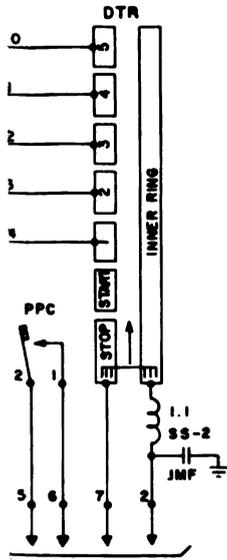
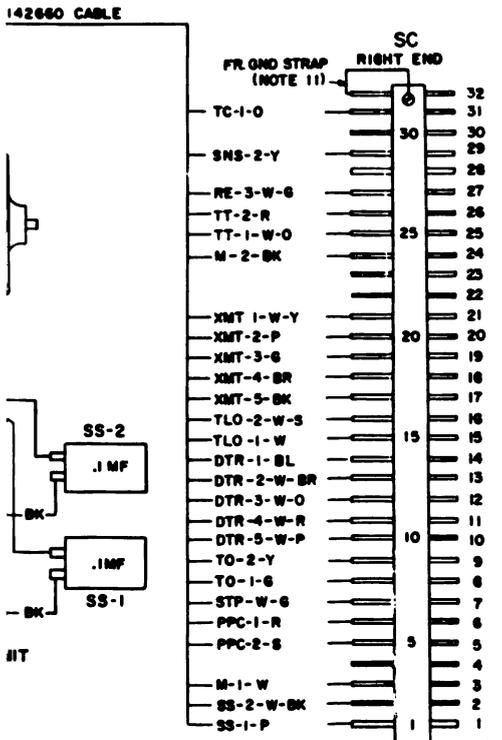
10. DYNAMIC OPERATION

10.01 Since XD dynamic operation is dependent upon external automatic control circuitry, such operation is outlined in circuit descriptions supplied with drawings covering such related circuitry.

11. CONCLUSION

11.01 This circuit arrangement represents the FAA automatic system standard to be employed throughout the teletypewriter system, whatever the application.

FIG 2
ACTUAL



NOTES:

- 1- RESISTANCE OF COILS AND RESISTORS SHOWN IN OHMS.
- 2- SEE LEGEND FOR FUNCTIONAL DESIGNATION.
- 3- XD EQUIP. W/113772 MOD. KIT (STEEL CL. 100 WPM)
- 4- PPC & TLO NOT PROVIDED UNLESS REQUIRED. WHERE MISSING, FOLD LEADS BACK AND TAPE.
- 5- RUBBER STAMP EVERY FIFTH TERM. ON "SC" AS SHOWN.
- 6- "RE" SHOWN FOR 48V.D-CBMS OPERATION: 0.195 AMP, 0.020 SECONDS OPERATING TIME. FOR 110V A-C STRAP "RE" TERMS. 1-2. FOR 110V D-C "RE" IS NOT STRAPPED.
- 7- COVER LEADS AT "RE" TERMS. WITH HIGH TEMP. TUBING. 60024 RM FOR NO.20 WIRE, 60025 RM FOR NO.18 WIRE.
- 8- PPC SHOWN OPERATED (STOP POSITION). CONTACT 9 IS CLOSEST TO 84594 BRACKET.
- 9- FIG. 3 IS TOP VIEW OF 32 POINT RECEPTACLE PART NO. 142708 REPLACING 77125 CONTACT ASSEM. ON 115932 MT6 PLATE ASSEM. SHORTING CONTACTS ARE SHOWN IN MODIFICATION POSITION.
- 10- PART NO.143129 COVERS XD247AB/HJ NAME PLATE.
- 11- STRAP IS NOT PART OF 142660 CABLE. USE NO.18 BLACK FLEXIBLE CONDUCTOR.
- 12- USE 70388 SPRING.

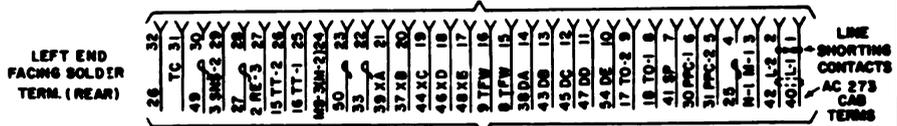
SYMBOLS

- SPliced AND TAPed
- FOLDED AND TAPed
- INDICATES PAIR.
- TRML ON 32-PT BASE CONNECTOR (FIG. 3)
- TRML ON 32-PT XD CONNECTOR (SC) (FIG. 2)
- INDICATES HOLE THRU BASE

LEGEND

| DESIGNATION | FUNCTION | TELETYPE PART NO |
|-------------|---------------------------|--|
| DTR | DISTRIBUTE CONTACTS | 77070 DISC |
| M | MOTOR (NOTE 3) | 113396 ARR'GT "HJ" |
| SNS | SENSE CLUTCH MAGNET | 198 M MAGNET |
| SS1 | SPARK SUPPRESSION 1 | 92217 FILTER ASSEMBLY |
| SS2 | SPARK SUPPRESSION 2 | |
| TC | TAPE CONTROL SWITCH | 107393 SWITCH |
| TFW | TAPE FEED WITHHOLD MAGNET | 97460 TAPE STOP MAGNET 190M (INCLUDED IN MOD. KIT 10696)(NOTE 4) |
| TO | TAPE-OUT CONTACTS | 97467 TAPE-OUT CTC |
| XMT | TRANSMITTING CONTACTS | 128818 CTC ASSEM. |
| TT | TIGHT-TAPE CONTACTS | 77079 TAPE STOP ASSEM. |
| PPC | PULSE-PER-CHARACTER CTCs | 139746 CONTACT (ASSEM)(NOTE 4) AUX |
| SC | SLIP CONNECTION | 113812 TRML BLOCK ASSEM. |
| RE | RESISTANCE | 86961 RESISTOR |

TO FIG. 1



SEE DR. D-40053-1

FIG. 3
XD MOUNTING PLATE (ASSEM)

| | | | |
|---|--|---------|-----|
| D | TC-1 RE-CONNECTED TO SC-31 | 8/25/68 | JMK |
| C | ADDED PR. END STRAP TERM 32 | 8/25/68 | JMK |
| B | FIG. 3 AC 273 CAS TERMS CONNECTED | 8/13/68 | JMK |
| A | CONNECTED FIG. 1 TO SHOW XMT SPACE CONTACTS COMMON | 8/25/68 | JMK |

FEDERAL AVIATION AGENCY
COMMUNICATIONS DIVISION
TELETYPE SYSTEMS
MODEL 14 XD ARRANGED FOR
AUTOMATIC SERVICE (XD247AB/HJ)

C.B.C. *JMK*
9-30-68 DR D-40052-1

9. 5-WIRE DISTRIBUTOR USE

9.01 Auxiliary contacts PPC and tape-feed-withhold magnet TFW are used and must be present. Tape control switch TC is not used.

9.02 External connections (see associated system and job drawings) are established as follows:

(1) SC terminals

- 2 - DTR Common
- 10 - " Pulse #5
- 11 - " " 4
- 12 - " " 3
- 13 - " " 2
- 14 - " " 1
- 7 - " " STOP
- 5 - Pulse-per-character PPC (for external synchronization)
- 6 - " " " " " "
- 3 - A-C
- 24 - "
- 15 - Tape-feed-withhold magnet TFW
- 16 - " " " "

(2) Provide a tape control circuit loop with SNS, TT, TO as required by the particular application (see associated system and job drawings).

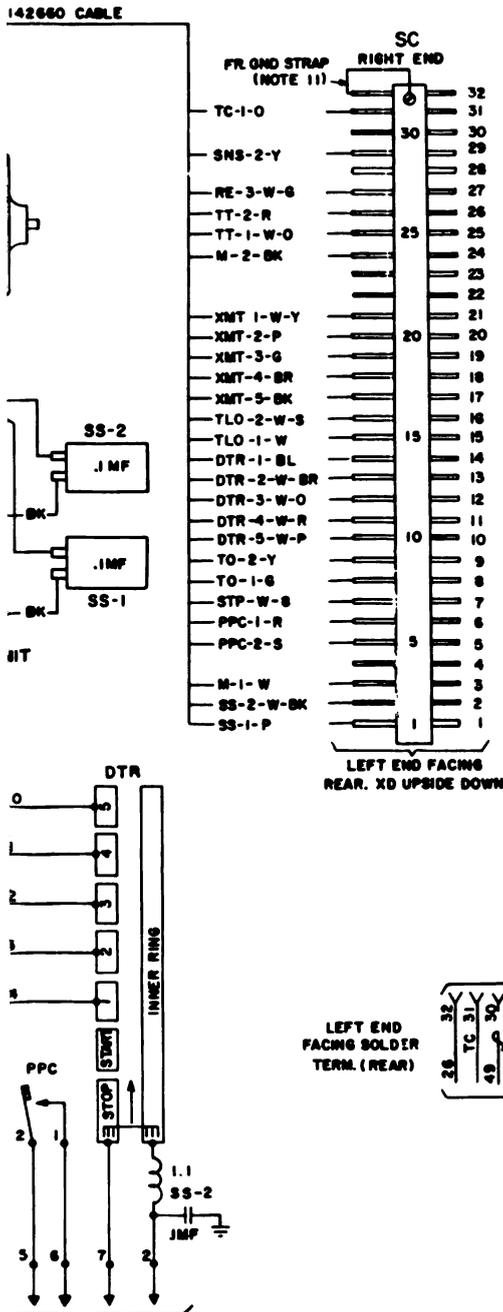
10. DYNAMIC OPERATION

10.01 Since XD dynamic operation is dependent upon external automatic control circuitry, such operation is outlined in circuit descriptions supplied with drawings covering such related circuitry.

11. CONCLUSION

11.01 This circuit arrangement represents the FAA automatic system standard to be employed throughout the teletypewriter system, whatever the application.

FIG 2
ACTUAL



NOTES:

- 1- RESISTANCE OF COILS AND RESISTORS SHOWN IN OHMS.
- 2- SEE LEGEND FOR FUNCTIONAL DESIGNATION.
- 3- XD EQUIP. W/113772 MOD. KIT (STEEL CL. 100 WPM)
- 4- PPC & TLO NOT PROVIDED UNLESS REQUIRED. WHERE MISSING, FOLD LEADS BACK AND TAPE.
- 5- RUBBER STAMP EVERY FIFTH TERM. ON "SC" AS SHOWN.
- 6- "RE" SHOWN FOR 48V. D-C SNS OPERATION: 0.195 AMP, 0.020 SECONDS OPERATING TIME. FOR 110V A-C STRAP "RE" TERMS. 1-2. FOR 110V D-C "RE" IS NOT STRAPPED.
- 7- COVER LEADS AT "RE" TERMS. WITH HIGH TEMP. TUBING. 60024 RM FOR NO. 20 WIRE, 60025 RM FOR NO. 18 WIRE.
- 8- PPC SHOWN OPERATED (STOP POSITION). CONTACT 1 IS CLOSEST TO 84594 BRACKET.
- 9- FIG. 3 IS TOP VIEW OF 32 POINT RECEPTACLE PART NO. 142708 REPLACING 77125 CONTACT ASSEM. ON 115932 MTS PLATE ASSEM. SHORTING CONTACTS ARE SHOWN IN MODIFICATION POSITION.
- 10- PART NO. 143129 COVERS XD247AB/HJ NAME PLATE.
- 11- STRAP IS NOT PART OF 142660 CABLE. USE NO. 18 BLACK FLEXIBLE CONDUCTOR.
- 12- USE 70388 SPRING.

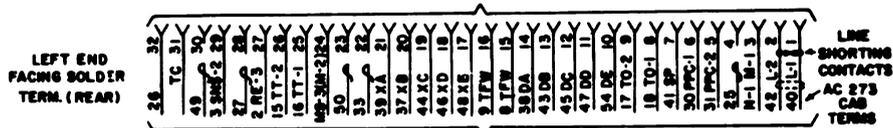
SYMBOLS

- SPLICED AND TAPED
- FOLDED AND TAPED
- INDICATES PAIR.
- TRML ON 32-PT BASE CONNECTOR (FIG. 3)
- TRML ON 32-PT XD CONNECTOR (SC) (FIG. 2)
- INDICATES HOLE THRU BASE

LEGEND

| DESIGNATION | FUNCTION | TELETYPE PART NO |
|-------------|---------------------------|---|
| DTR | DISTRIBUTE CONTACTS | 77070 DISC |
| M | MOTOR (NOTE 3) | 113396 ARR'G'T "HJ" |
| SNS | SENSE CLUTCH MAGNET | 198 M MAGNET |
| SS1 | SPARK SUPPRESSION 1 | 92217 FILTER ASSEMBLY |
| SS2 | SPARK SUPPRESSION 2 | |
| TC | TAPE CONTROL SWITCH | 107393 SWITCH |
| TFW | TAPE FEED WITHHOLD MAGNET | 97460 TAPE STOP MAGNET 190M (INCLUDED IN MOD. KIT 106916)(NOTE 4) |
| TO | TAPE-OUT CONTACTS | 97467 TAPE-OUT CTC |
| XMT | TRANSMITTING CONTACTS | 128615 CTC ASSEM. |
| TT | TIGHT-TAPE CONTACTS | 77079 TAPE STOP ASSEM. |
| PPC | PULSE-PER-CHARACTER CTCs | 139746 CONTACT (ASSEM. NOTE 4) AUX |
| SC | SLIP CONNECTION | 113912 TRML BLOCK ASSEM. |
| RE | RESISTANCE | 86951 RESISTOR |

TO FIG. 1



SEE DR. -D-40053-1

FIG. 3
XD MOUNTING PLATE (ASSEM)

| | | | |
|---|--|---------|----|
| D | TC-1 RE-CONNECTED TO SC-31 | 8/28/68 | DR |
| C | ADDED FR. GND STRAP TERM 32 | 8/28/68 | DR |
| B | FIG. 3 AC 273 CAS TERMS CORRECTED | 9/13/68 | DR |
| A | CORRECTED FIG. 1 TO SHOW XMT SPACE CONTACTS COMMON | 9/29/68 | DR |

FEDERAL AVIATION AGENCY
COMMUNICATIONS SYSTEMS DIVISION

TELETYPEWRITER SYSTEMS
MODEL 14 XD ARRANGED FOR
AUTOMATIC SERVICE (XD247AB/HJ)

CAC: *J.K.K.*
9-30-68 DR D-40052-1

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1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 24.

January 12, 1961

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER TYPE 28 (11) - EEM NO. 612

TO : Chief, Facilities and Materiel Field
Division Nos. 1-4
Regional Manager, Regions 5 & 6

FROM : Chief, Maintenance Engineering Branch, FM-130

SUBJECT: Perforators and Reperforators - LPR, LPE, LTPE, LARP; Needle Bearing and Associated Improved Parts

1. OBJECT:

1.1 To modernize all M28 Perforators, Code LPE, LTPE, and Reperforators, Code LPR, LARP by replacing main shafts and associated sleeve bearings with new main shafts and associated needle bearings less subject to failures currently being reported from the field. This will increase efficiency of the data-handling system and reduce the maintenance burden.

2. REASON FOR MODIFICATION:

2.1 To update all M28 Perforators and Reperforators comparable to the latest units off the production line, thereby reducing maintenance demands and increasing efficiency of the data-handling system, particularly at higher speeds.

3. APPLICATION:

3.1 This modification replaces all main shafts and associated sleeve bearings with new main shafts and associated needle bearings on the following FAA-system equipments:

| <u>Equipment</u> | <u>Code</u> | <u>Mod. Kit Part No.</u> | <u>Spec. No.</u> |
|--|-------------|--------------------------|------------------|
| 3.1.1 M28 ASR Perforator | LTPE | 173336 | 5979S |
| 3.1.2 M28 Reperforator (2-wire) | LPR | 173336 | 5979S |
| 3.1.3 M28 Reperforator (5-wire) (Plan 59 units) | LARP | 173339 | 5979S |
| 3.1.4 M28 ASR Perforator | LPE | 173338 | 5979S |

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER TYPE 28 (11) - EEM NO. 612

All system units bearing these codes shall be so modified per this EEM. All new equipment procured on future programs will be equipped with these new parts.

4. REFERENCE:

4.1 Teletype Corporation Specification 5979S, together with bulletins applicable to the equipment.

5. MATERIAL REQUIRED:

5.1 For M28 ASR Perforator, Codes LPE and LTPE, use 173336 Modification Kit.

5.2 For M28 Reperforator, Code LPR, use 173336 Modification Kit.

5.3 For M28 Reperforator, Code LARP, use 173339 Modification Kit.

5.4 For each unit:

| | <u>DESCRIPTION</u> | <u>KEY</u> | <u>PART NO.</u> | <u>QTY EA.</u> |
|-----|--------------------|------------|-----------------|----------------|
| (1) | SHIM | # | 151246 | 2 |
| (2) | SCREW | # | 151442 | 2 |
| (3) | SCREW | # | 151690 | 1 |
| (4) | WASHER | # | 156465 | 1 |
| (5) | RING | # | 156467 | 1 |
| (6) | HUB | # | 162248 | 1 |

These associated, improved parts, shown in 5979S with the key #, but not included in the Modification Kits, must be ordered separately at the time of ordering the Kits.

6. SOURCE OF MATERIALS:

6.1 OMB Stock.

7. TOOLS AND EQUIPMENT REQUIRED:

7.1 Standard teletypewriter tools.

6170.1
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CHAPTER 24.

January 12, 1961

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER TYPE 28 (11) - EEM NO. 612

TO : Chief, Facilities and Materiel Field
Division Nos. 1-4
Regional Manager, Regions 5 & 6

FROM : Chief, Maintenance Engineering Branch, FM-130

SUBJECT: Perforators and Reperforators - LPR, LPE, LTPE, LARP; Needle Bearing and Associated Improved Parts

1. OBJECT:

1.1 To modernize all M28 Perforators, Code LPE, LTPE, and Reperforators, Code LPR, LARP by replacing main shafts and associated sleeve bearings with new main shafts and associated needle bearings less subject to failures currently being reported from the field. This will increase efficiency of the data-handling system and reduce the maintenance burden.

2. REASON FOR MODIFICATION:

2.1 To update all M28 Perforators and Reperforators comparable to the latest units off the production line, thereby reducing maintenance demands and increasing efficiency of the data-handling system, particularly at higher speeds.

3. APPLICATION:

3.1 This modification replaces all main shafts and associated sleeve bearings with new main shafts and associated needle bearings on the following FAA-system equipments:

| <u>Equipment</u> | <u>Code</u> | <u>Mod. Kit Part No.</u> | <u>Spec. No.</u> |
|--|-------------|------------------------------|----------------------|
| 3.1.1 M28 ASR Perforator | LTPE | 173336 | 5979S |
| 3.1.2 M28 Reperforator (2-wire) | LPR | 173336 | 5979S |
| 3.1.3 M28 Reperforator (5-wire) (Plan 59 units) | LARP | 173339 | 5979S |
| 3.1.4 M28 ASR Perforator | LPE | 173338 | 5979S |

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER TYPE 28 (11) - EEM NO. 612

All system units bearing these codes shall be so modified per this EEM. All new equipment procured on future programs will be equipped with these new parts.

4. REFERENCE:

4.1 Teletype Corporation Specification 5979S, together with bulletins applicable to the equipment.

5. MATERIAL REQUIRED:

5.1 For M28 ASR Perforator, Codes LPE and LTPE, use 173336 Modification Kit.

5.2 For M28 Reperforator, Code LPR, use 173336 Modification Kit.

5.3 For M28 Reperforator, Code LARP, use 173339 Modification Kit.

5.4 For each unit:

| | <u>DESCRIPTION</u> | <u>KEY</u> | <u>PART NO.</u> | <u>QTY EA.</u> |
|-----|--------------------|------------|-----------------|----------------|
| (1) | SHIM | # | 151246 | 2 |
| (2) | SCREW | # | 151442 | 2 |
| (3) | SCREW | # | 151690 | 1 |
| (4) | WASHER | # | 156465 | 1 |
| (5) | RING | # | 156467 | 1 |
| (6) | HUB | # | 162248 | 1 |

These associated, improved parts, shown in 5979S with the key #, but not included in the Modification Kits, must be ordered separately at the time of ordering the Kits.

6. SOURCE OF MATERIALS:

6.1 OMB Stock.

7. TOOLS AND EQUIPMENT REQUIRED:

7.1 Standard teletypewriter tools.

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER TYPE 28 (11) - EEM NO. 612

8. WORK TO BE PERFORMED BY:

- 8.1 Maintenance field personnel, on all equipment in the system.
- 8.2 Shop personnel on all equipment passing through the shop.

9. WHEN MODIFICATION IS TO BE PERFORMED:

- 9.1 Immediately upon failure in service; the replacement parts requisitioned shall be per this EEM instead of the old style parts.
- 9.2 On all system units commencing January 3, 1961, but not to interfere with 100WPM AC&O implementation. Parts are expected to be stocked in quantity by this date.

10. ESTIMATED TIME REQUIRED:

- 10.1 Eight hours per unit. (Total system units approximately 4,500.)

11. DISPOSITION OF SURPLUS PARTS:

- 11.1 Discard as junk.

12. MODIFICATION PROCEDURE:

- 12.1 Comply with the provisions of Teletype Corporation Specification No. 5979S furnished with each set of parts.

13. TEST AFTER INSPECTION:

- 13.1 Check on-line operation of units after reassembly and preliminary checking.

14. USE:

- 14.1 FAA system-wide, without exception, on all M28 units.

15. RESULTS OF MODIFICATION:

- 15.1 Reduced maintenance demands, increased reliability and efficiency of units, and greater air safety resulting from more precise data handling results.

16. CORRECTIONS TO DRAWINGS:

- 16.1 None.

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER TYPE 28 (11) - EEM NO. 612

17. CORRECTIONS TO INSTRUCTIONS:

17.1 Temporarily retain a copy of 5979S with the associated equipment bulletins until the revised bulletin pages are forwarded from Teletype Corporation.

18. CORRECTIONS TO FORM 198 and FAA-416:

18.1 Not applicable to Form 198.

18.2 Enter under remarks on Form FAA-416: "Modified in accordance with EEM NO. 612".

19. COORDINATION:

19.1 This modification has been coordinated with the Communications Engineering Branch.

20. IMPLEMENTATION:

20.1 This modification is planned for as prompt implementation as possible without causing interference with the 100WPM AC&O Program.

Paul R. Colby
for Richard C. Young, FM-130

The need for this modification has been accentuated by analysis of regional failure reports.

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 25.

November 2, 1960

ELECTRONIC EQUIPMENT MODIFICATION NO. 618; APULS TYPE CA-5032 (1)

TO : Chief, Facilities and Materiel Field Division, Nos. 1-4
Regional Manager, Regions 5 and 6

FROM : Chief, Communications Engineering Branch, FM-340

SUBJECT: Modifications to APULS to improve operation with ADIS and AMOS

1. OBJECT:

1.1 To prevent generation of register pulses during reset, and to delete transmission of heading groups in A-2 operation, thereby preventing response of AMOS stations to A-2 scan calls.

2. REASON FOR MODIFICATION:

2.1 To prevent possible incorrect indication to ADIS of tape availability and to provide a necessary difference in A-1 and A-2 operation to be distinguished by AMOS equipment.

3. APPLICATION:

3.1 This modification shall be made on all type CA-5032 APULS Units which are operating into Service "A" Circuits.

4. REFERENCES:

4.1 Stelma, Incorporated, Instruction Book for AUTOMATIC PROGRAM UNIT, LOW SPEED (APULS), Type CA-5032. (Furnished with equipt.)

5. MATERIALS REQUIRED:

5.1 One each Switch, Push, 3 form C contacts, equivalent to Switchcraft, Inc., part number 1009.

5.2 Three feet of No. 18 Thermoplastic Stranded Wire.

6. SOURCE OF MATERIALS:

6.1 Station stock or Local Purchase.

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Miscellaneous small hand tools.

November 2, 1960

8. WORK TO BE PERFORMED BY:

- 8.1 Maintenance Personnel on units already installed.
- 8.2 Establishment Personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

- 9.1 Immediately on receipt of this modification for units already installed.
- 9.2 At time of installation for units not already installed.

10. ESTIMATED TIME REQUIRED:

- 10.1 Two man hour per APULS Unit.

11. MODIFICATION PROCEDURE:

11.1 To delete transmission of heading groups in A-2 operation:

- a. Connect a lead from (unused) spring contact 5R of relay K-103 (A-2 Schedule) to (unused) terminal 84 of J-106.
- b. Connect a lead from (unused) spring contact 6R of relay K-103 (A-2 Schedule) to terminal 70 of J-106 (W-Y wire exists on terminal 70).
- c. Connect a lead from the rear extension of terminal 1A of the FCN row of the coding panel to (unused) terminal 84 of P-601.
- d. Mark "A2D" on the front of the coding panel adjacent to terminal FCN 1A.
- e. Strap terminals AF1 and AF2 (or ASD1 and ASD2) to terminal A2D on front side of coding panel.

11.2 To prevent generation of register pulses during reset:

- a. Remove both Red leads from terminal 4 of J-103, solder together and tape.
- b. Mark and remove leads from S-109.
- c. Remove S-109 and replace with new switch.

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EEM NO. 618

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- d. Connect leads to new switch to provide original circuitry.
- e. Connect leads from unused break contacts of the new S-109 switch to terminals 4 of J-103 and 18 of J-106 (Red wire exists on terminal 18 of J-106)
- f. Adjust spring contact to break first on circuit connected in preceding paragraph e., and before original circuitry is broken.
- g. Check operation of unit in accordance with section 19 before lacing new wiring into existing cables.

12. DISPOSITION OF SURPLUS PARTS:

12.1 Discarded parts and materiel can be retained in station stock.

13. RESULTS OF MODIFICATION:

13.1 Improved operation of ADIS and AMOS Equipments.

14. CORRECTION TO DRAWINGS:

14.1 Correct all applicable drawings in Instruction Book to show this modification.

15. CORRECTIONS TO INSTRUCTIONS:

15.1 Attach this modification to the Instruction Book.

16. CORRECTION TO FORM 198 DATA AND ACA-416:

16.1 Not applicable to Form 198 Data.

16.2 Enter under remarks on ACA-416 "Modified in accordance with EEM No. 618".

17. USE:

17.1 APULS Units modified in accordance with this EEM will be required on circuits associated with ADIS and AMOS Equipments.

18. COORDINATION:

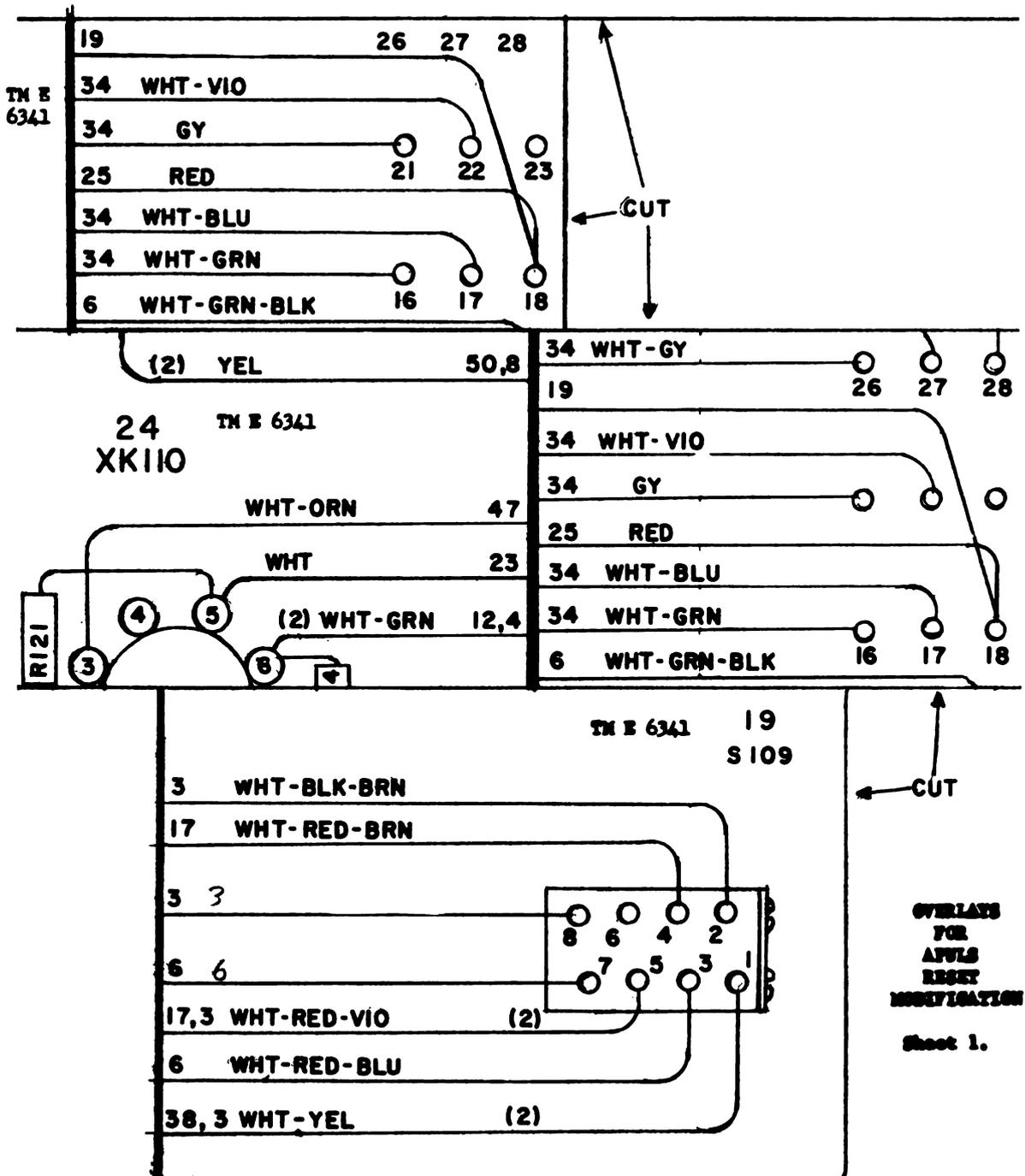
18.1 This modification has been coordinated with the Maintenance Engineering Branch.

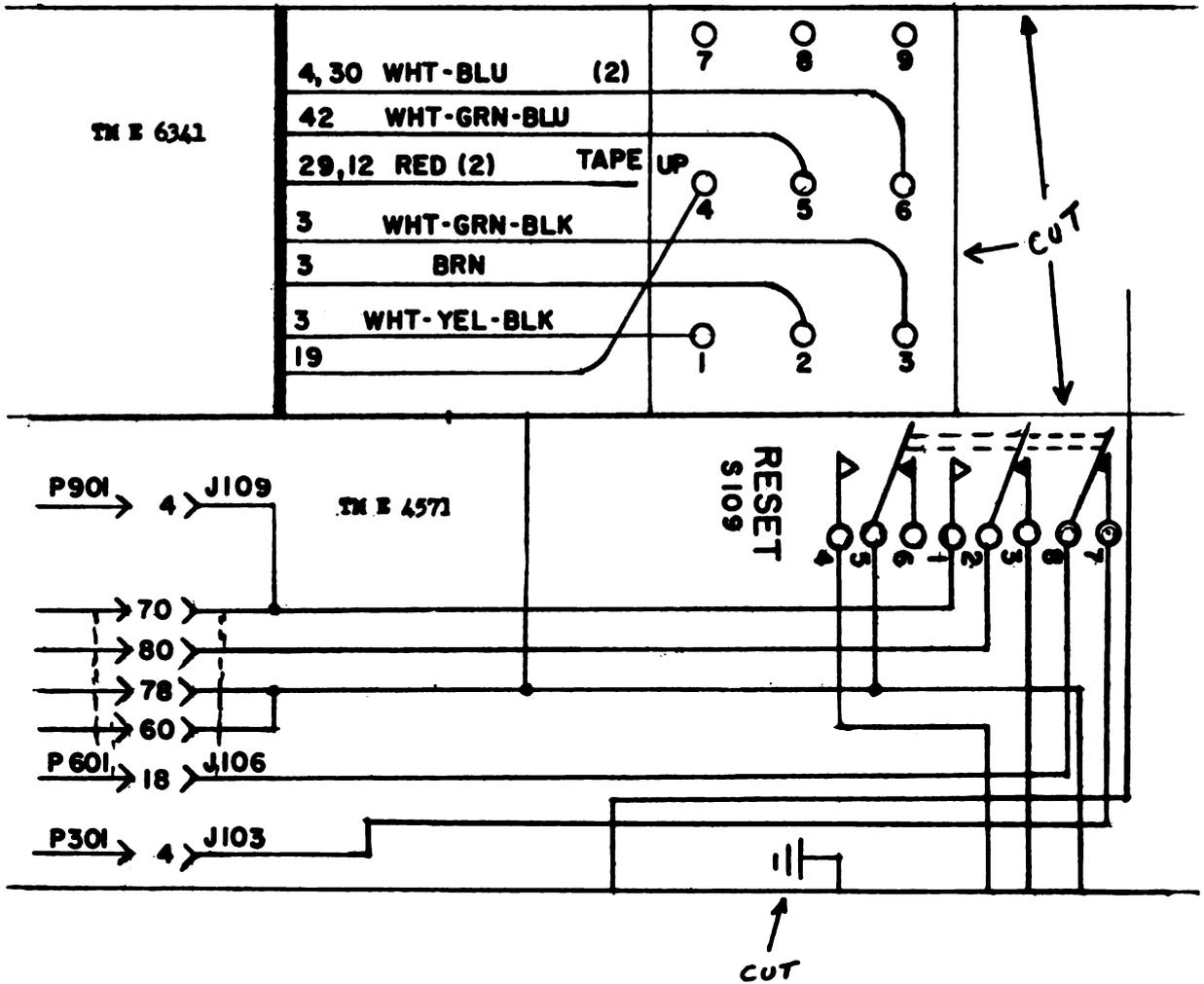
19. TEST AFTER MODIFICATION:

- 19.1 Test several "Reset" operations to determine that register pulses are not generated as selector switches leave "register patched" groups. (A-1 and A-2 operation)
- 19.2 Make visual check of work to determine general appearance.

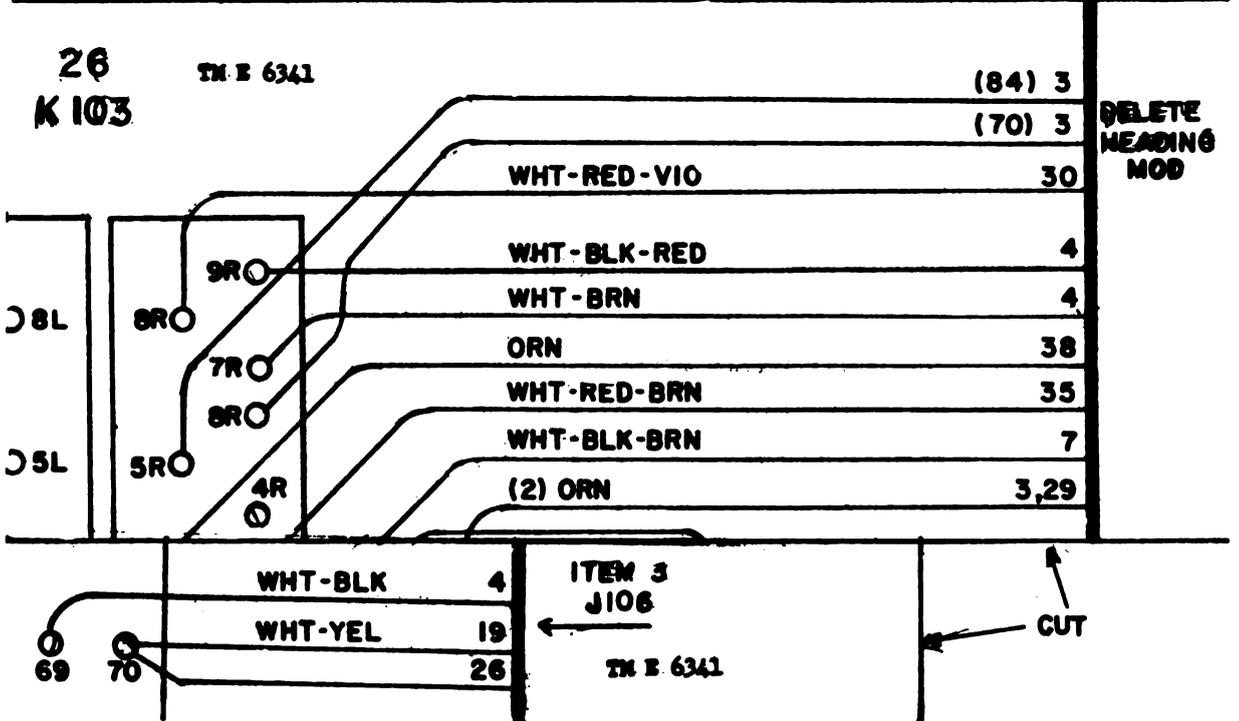
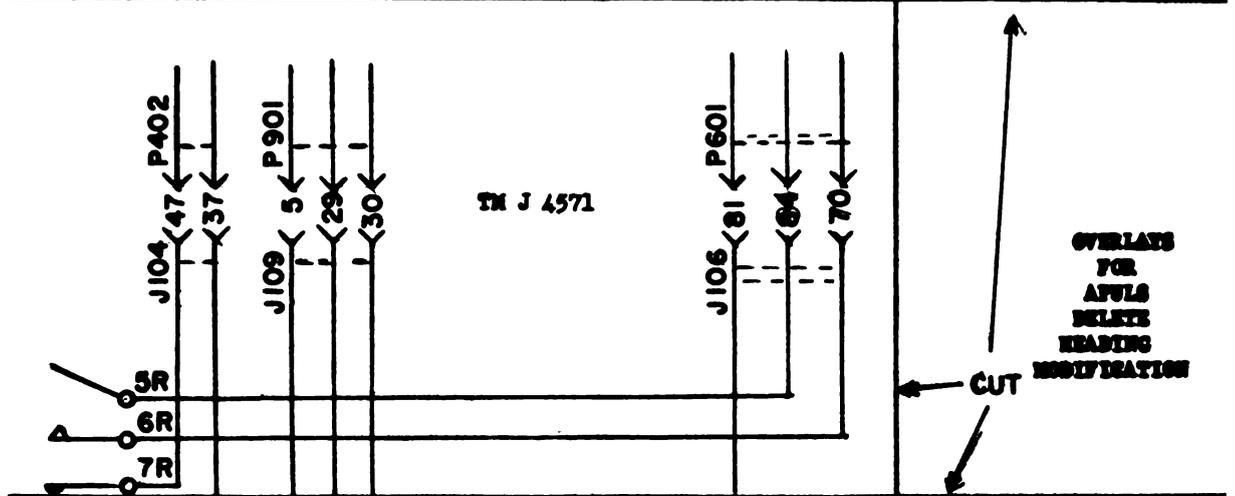
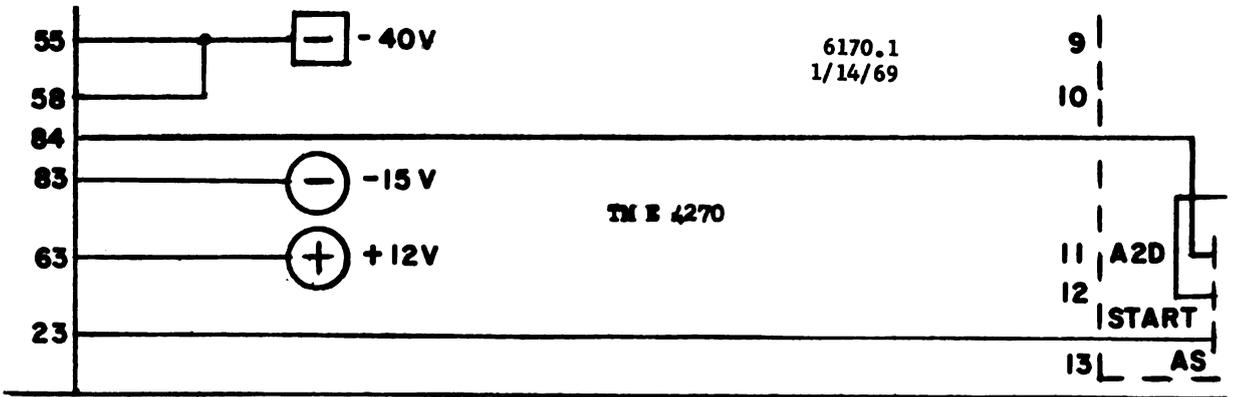
L. B. Blair
L. B. Blair, FM-340

Attachments





OVERLAYS FOR
AFCES
RESET
INDICATOR
Sheet 2.



6170.1
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FEDERAL AVIATION AGENCY

Washington 25, D. C.

CHAPTER 26.

November 30, 1960

ELECTRONIC EQUIPMENT MODIFICATION NO. 626; APULS TYPE CA-5032 (2)

TO : Chief, Facilities and Materiel Field Division, Nos. 1-4
Regional Manager, Regions 5 and 6

FROM : Chief, Communications Engineering Branch, FM-340

SUBJECT: Modification to APULS to Improve Operation

1. OBJECT:

- 1.1 To improve operation of the Character Selector Driver.
- 1.2 To eliminate possible shock in handling equipment.
- 1.3 To provide a dust cover over the top panels.
- 1.4 To provide a retaining bracket for the rear connector.

2. REASON FOR MODIFICATION:

- 2.1 To increase efficiency of the Character Selector Driver by raising the filament operating voltage above critical low values.
- 2.2 To eliminate potential shock hazards that exist in handling the equipment due to the presence of exposed fuse connections on the underside of the front panel.
- 2.3 To protect the coding panel and printed circuit cards from dust particles and other objects which could damage the equipment or impair its operation.
- 2.4 To eliminate the possibility of accidental disconnect of the rear connector plug from vibration or handling.

3. APPLICATION:

- 3.1 This modification shall be made on all type CA-5032 APULS Units.

4. REFERENCES:

- 4.1 Stelma, Incorporated, Instruction Book for AUTOMATIC PROGRAM UNIT, LOW SPEED (APULS), Type CA-5032. (Furnished with equipment)

5. MATERIALS REQUIRED:

- 5.1 One each Dust Cover complete with mounting screws.
5.2 One each Connector Bracket complete with mounting screws.

6. SOURCE OF MATERIALS:

- 6.1 The Kit required in Section 5 to be requisitioned from the Operating Materiel Branch (OMB) under the following NSC number: 00-0036.00

7. TOOLS OR TEST EQUIPMENT REQUIRED:

- 7.1 Miscellaneous small hand tools.

8. WORK TO BE PERFORMED BY:

- 8.1 Maintenance Personnel on units already installed.
8.2 Establishment Personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

- 9.1 At the discretion of the Region.

10. ESTIMATED TIME REQUIRED:

- 10.1 One hour per APULS Unit.

11. MODIFICATION PROCEDURE:

- 11.1 To improve operation of the Character Selector Driver:

- a. Remove Lead from Terminal 2 of T-101 (G-W-S) and replace on Terminal 3 of T-101.
b. Remove Lead from Terminal 7 (W-BK-BR) on Terminal Board TB-103 and place on Terminal 8 with existing lead (W-BL-BK).

11.2 To eliminate possible shock in handling equipment:

- a. Remove all external power.
- b. Loosen hexagon nuts on both AC Fuses directly behind the front panel.
- c. Rotate both fuses 90 degrees and retighten hexagon nuts.

11.3 To provide a dust cover over the top panels:

- a. Mount cover supplied under Section 6 utilizing existing tapped mounting holes.

11.4 To provide a retaining bracket for the rear connector:

- a. Remove one P-103 mounting nut and mount bracket furnished under Section 6. Tighten clamp screw against J-103 firmly.

12. DISPOSITION OF SURPLUS PARTS:

12.1 Not applicable.

13. RESULTS OF MODIFICATION:

13.1 Improved operation of the APULS Character Selector Driver.

13.2 Reduced possibility of accidental shock.

13.3 Protection from dust and accidental damage from other objects.

13.4 Reliable protection from accidental disconnect of connector plug.

14. CORRECTION TO DRAWINGS:

14.1 Correct Figure 33 and 40 in the Instruction Book to show the modification performed in Section 11.1.

15. CORRECTION TO INSTRUCTIONS:

15.1 Attach this modification to the Instruction Book.

16. CORRECTION TO FORM 198 DATA AND ACA-416:

16.1 Not applicable to Form 198 Data.

16.2 Enter under Remarks on ACA-416 "Modified in accordance with EEM No. 626".

17. USE:

17.1 Not applicable.

18. COORDINATION:

18.1 This modification has been coordinated with the Maintenance Engineering Branch.

19. TEST AFTER MODIFICATION:

19.1 Make visual check of work to determine general appearance.


L. B. Blair, FM-340

6170.1
1/14/69

FEDERAL AVIATION AGENCY

Washington 25, D. C.

CHAPTER 27.

January 5, 1961

ELECTRONIC EQUIPMENT MODIFICATION NO. 640; APULS TYPE CA-5032 (3)

TO : Chief, Facilities and Materiel Field Division, Nos. 1-4
Regional Manager, Regions 5 and 6

FROM : Chief, Communications Engineering Branch

SUBJECT: Modification to APULS to Improve Operation with ADIS

1. OBJECT:

- 1.1 To delete the blinding of calls during an A-2 scan.
- 1.2 To delete the blind on ADIS during APULS shutdown.

2. REASON FOR MODIFICATION:

- 2.1 To permit uniform preparation of messages.
- 2.2 To eliminate necessity of unblind coding.

3. APPLICATION:

- 3.1 This Modification shall be made on all CA-5032 APULS units which are operating into Service "A" Circuits.

4. REFERENCES:

- 4.1 Stelma, Incorporated, Instruction Book for Automatic Program Unit, Low Speed (APULS), Type CA-5032. (Furnished with equipment)

5. MATERIALS REQUIRED:

- 5.1 Approximately two and one half feet of No. 18 Thermoplastic Stranded Wire.

6. SOURCE OF MATERIALS:

- 6.1 Station stock or local purchase.

7. TOOLS OR TEST EQUIPMENT REQUIRED:
- 7.1 Miscellaneous small hand tools.
8. WORK TO BE PERFORMED BY:
- 8.1 Maintenance Personnel on units already installed.
- 8.2 Establishment Personnel on new installations.
9. WHEN MODIFICATION IS TO BE PERFORMED:
- 9.1 When authorized and scheduled by the cognizant Regional Office authority.
10. ESTIMATED TIME REQUIRED:
- 10.1 One half hour per APULS unit.
11. DISPOSITION OF SURPLUS PARTS:
- 11.1 None, paragraph 14 not applicable.
12. MODIFICATION PROCEDURE:
- 12.1 To delete the blinding of calls during an A-2 scan (Refer to: APULS DRAWING OVERLAY, DELETE BLINDING MODIFICATION NO. 1):
- a. Remove lead from pin #37 of J104 and tape.
- NOTE: This procedure removes the emitter of Q-413 blind gate.
- 12.2 To delete the blind on ADIS during APULS shutdown (Refer to: APULS DRAWING OVERLAY, DELETE BLINDING MODIFICATION NO. 2):
- a. Remove both violet leads from the coil of K107, solder together and tape.
- b. Install a lead from coil K107 to spring 3B of K109.
- NOTE: Do not interfere with diode CR121.
13. TEST AFTER MODIFICATION:
- 13.1 Make visual check of work to determine general appearance.
- 13.2 Make several "Reset" operations to determine that A-2 scan calls are monitored.
- 13.3 Make a test to determine that the ADIS blind has been removed during APULS shutdown.

January 5, 1961

14. RESULT OF MODIFICATION:

14.1 Improved operation of ADIS.

15. CORRECTIONS TO DRAWINGS:

15.1 Correct all applicable drawings in Instruction Books to show these modifications.

16. CORRECTIONS TO DRAWINGS:

16.1 Attach these Modifications to the Instruction Book.

17. CORRECTIONS TO FORM 198 DATA AND ACA-416:

17.1 Not applicable to Form 198 Data.

17.2 Enter under remarks on ACA-416 "Modified in accordance with EEM No. 640".

18. COORDINATION:

18.1 This Modification has been coordinated with the Maintenance Engineering Branch.

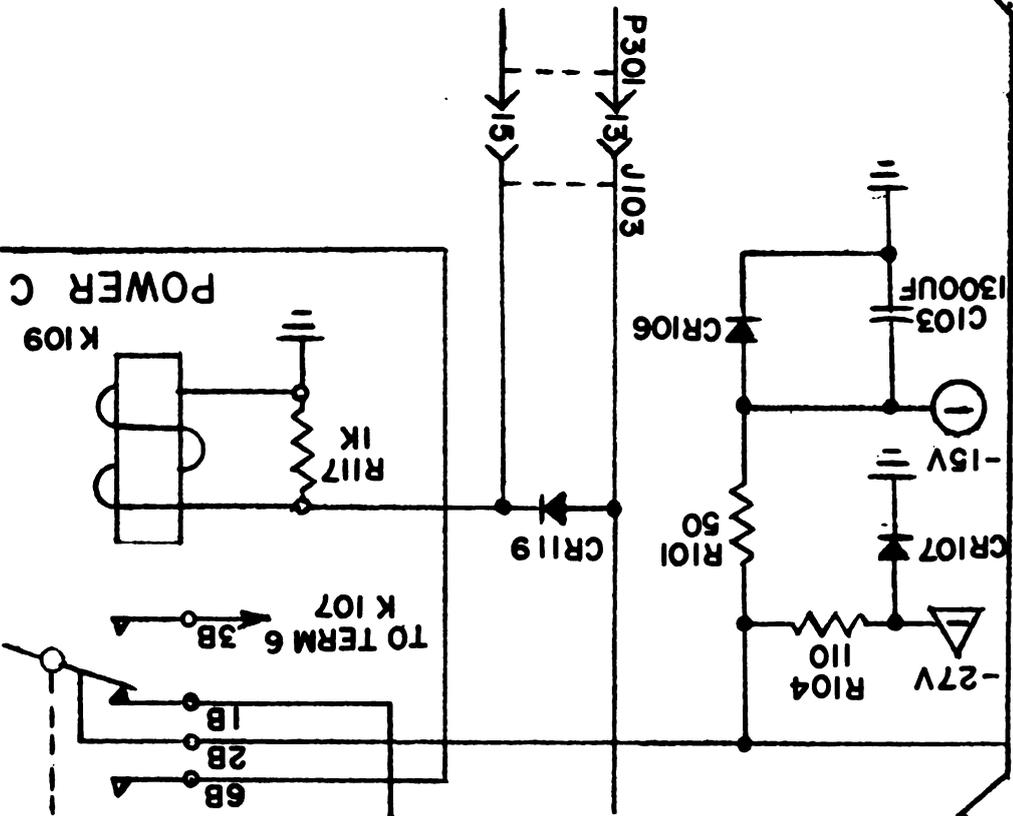
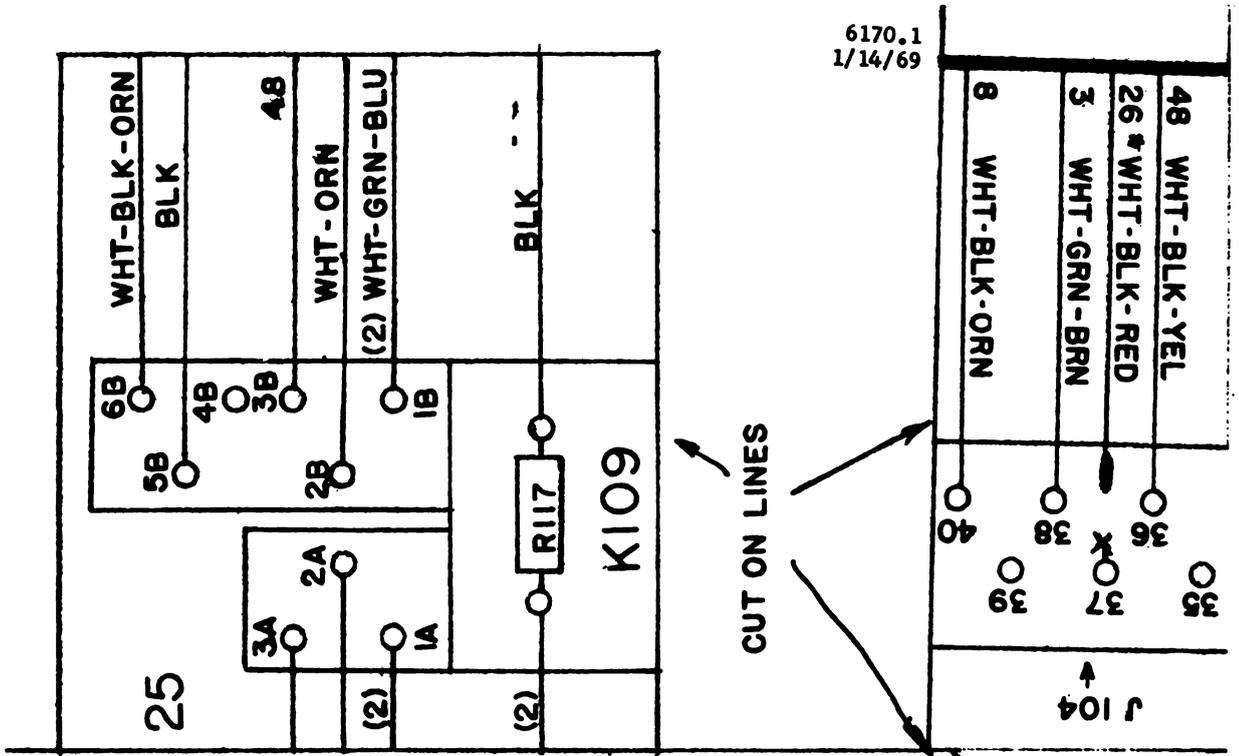
19. IMPLEMENTATION:

19.1 These Modifications will be implemented by the Regional Offices for ADIS installation.

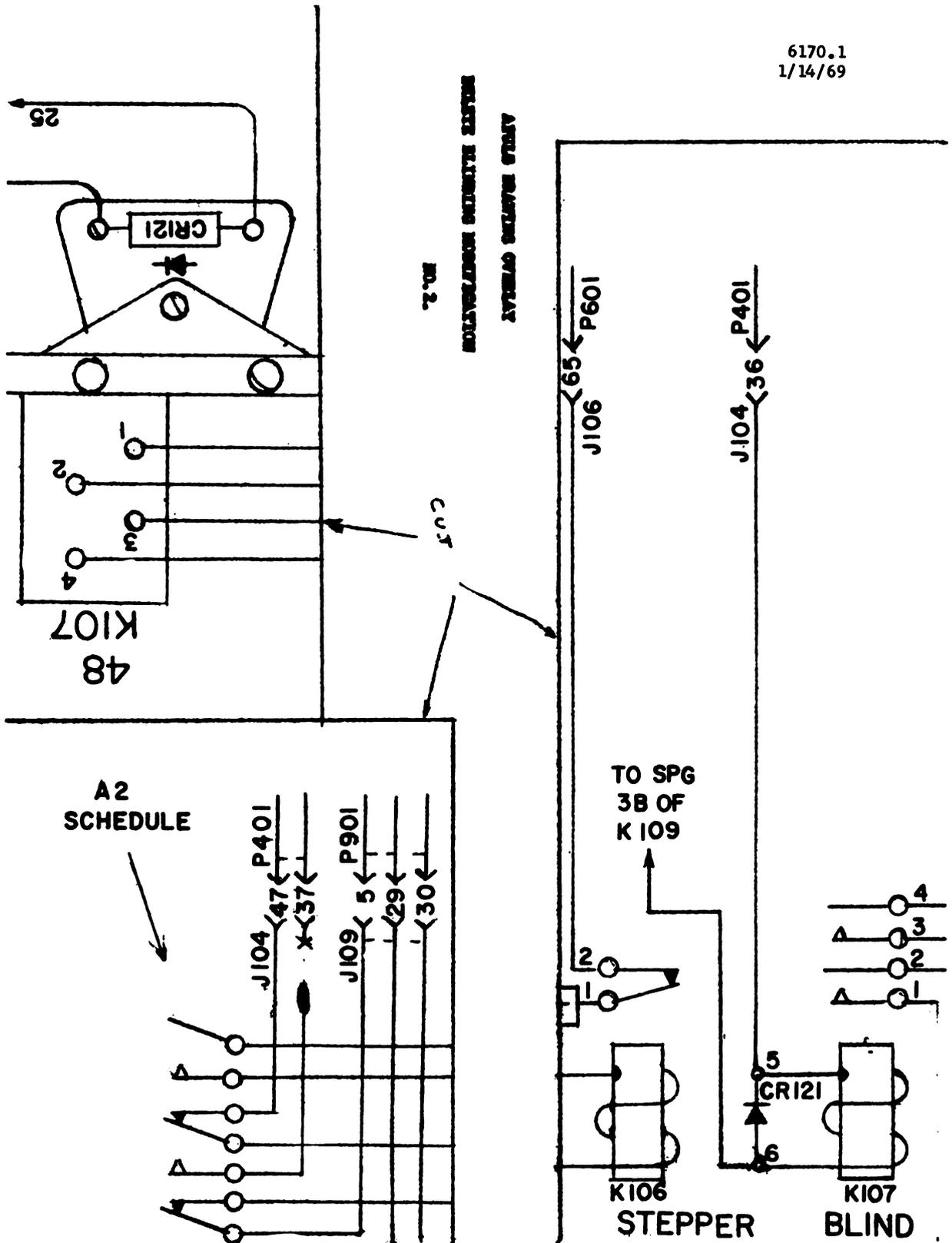

L. B. Blair, FM-340

Attachments: 1 - APULS Drawing Overlay Delete Blinding Modification No. 1
2 - APULS Drawing Overlay Delete Blinding Modification No. 2

6170.1
1/14/69



NO. 1. OR
MOTOR/RELAY DRIVER CIRCUIT



6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 28,

February 13, 1961

ELECTRONIC EQUIPMENT MODIFICATION - APULS CA-5032 (4) - EEM NO. 647

TO : Chief, Facilities and Materiel Field
Division Nos. 1-4
Regional Manager, Regions 5 & 6

FROM : Acting Chief, Maintenance Engineering Branch, FM-130

SUBJECT: Automatic Program Unit (Low Speed) - Type CA-5032; Service B Scan Call Code Change

1. OBJECT:

1.1 To provide shutdown signal (unlock code) for relay station reperformers prior to each APULS call.

2. REASON FOR MODIFICATION:

2.1 The present Service B control cycle arrangement of the APULS Type CA-5032 does not provide the unlock code, FIG CR LTR, in advance of each APULS call-up. Interruption to any station tape transmission, whether from line or local equipment trouble, shuts down that station transmitter but leaves the relay station reperformer activated (in the case of traffic being transmitted for relay to another circuit.) Under these circumstances, succeeding APULS Scan Calls are erroneously relayed and activate equipment on adjacent circuits.

2.2 This modification corrects this situation by changing the Scan Call code, transmitted as the initial portion of any call-up, from CR CR LTR to FIG CR LTR. This unlock code, FIG CR LTR shuts down any relay station reperformer that may have been left in an activated condition by previous circuit operation.

3. APPLICATION:

3.1 This modification shall be applied to each APULS Type CA-5032 operating and/or assigned to Service B circuits.

4. REFERENCE:

4.1 APULS CA-5032 (serial numbers 1-125) Instruction Book per contract Cca-33957, dated June 25, 1958.

ELECTRONIC EQUIPMENT MODIFICATION - APULS CA-5032 (4) - EEM NO. 647

4.2 EEM NO. 618 APULS Type CA-5032 (1)

" " 626 " " " (2)

" " 640 " " " (3)

4.3 Revised Main Chassis Wiring Diagram, Fig. 33, attached (previously disseminated to the field under cover of a memorandum by FM-347 dated May 27, 1960.) Note that the original wiring diagram provided in the advance Instruction Book referenced above, contained a number of errors.

5. **MATERIALS REQUIRED:**

5.1 One foot of No. 18 Thermoplastic stranded wire.

5.2 Solder (resin core.)

5.3 Waxed cord.

5.4 Friction tape.

6. **SOURCE OF MATERIALS:**

6.1 Station stock and/or local purchase.

7. **TOOLS OR TEST EQUIPMENT REQUIRED:**

7.1 Miscellaneous small hand tools.

8. **WORK TO BE PERFORMED BY:**

8.1 Maintenance personnel on units already installed.

8.2 Establishment personnel on new installations.

9. **WHEN MODIFICATION IS TO BE PERFORMED:**

9.1 Immediately upon receipt of this modification notice for units already installed.

9.2 At time of installation (on Service B circuits) for units not already installed.

10. **ESTIMATED TIME REQUIRED:**

10.1 Four man-hours per APULS (58 units total to be modified.)

ELECTRONIC EQUIPMENT MODIFICATION - APULS CA-5032 (4) - EEM NO. 647

11. DISPOSITION OF SURPLUS PARTS:

11.1 None.

12. MODIFICATION PROCEDURE:

12.1 At relay K-105 spring contact 3L, disconnect the strap to K-105 contact 6L. Tape this wire and fold back. Do not remove as it will be required at a future time if used on another type of service.

12.2 Provide a wire connecting K-105 spring contact 3L to terminal FG, located on the lower right-hand side of terminal board TB-101. Route this wire along the regular cable line and secure with waxed cord as desirable.

12.3 Move the AF stop from its present location in the group coded to identify the circuit to the AF or ASD terminal of the group coded to transmit the first "X" call (relay station reperforator).

12.4 Code the first and second characters of each "X" call groups to transmit CR, and code the third character of each "X" call group to transmit LTRS.

12.5 Identify the modified APULS by a label, tag, or marking, indicating "EEM NO. 647 SERVICE B OPERATION ONLY".

13. TEST AFTER INSPECTION:

13.1 Check on-line scan operation of the APULS to determine that the unlock code FIG CR LTR is now transmitted instead of the Scan Call code CR CR LTR in advance of call-up.

13.2 Ascertain that operating reperforators on associated relay circuits are in fact shut down by receipt of this unlock code at any point in the scan preceding a station call-up.

14. USE:

14.1 On all Service B (Area B) circuits.

15. RESULTS OF MODIFICATION:

15.1 On APULS Scan Calls, the Scan Call code CR CR LTR is deleted and the unlock code FIG CR LTR is substituted.

ELECTRONIC EQUIPMENT MODIFICATION - APULS CA-5032 (4) - EEM NO. 647

15.2 Operation of the modified APULS is limited to Service B circuits, where this substitution is authorized.

16. CORRECTION TO DRAWINGS:

16.1 Correct all affected drawings referenced above and when final drawings are furnished, correct these drawings accordingly.

17. CORRECTIONS TO INSTRUCTIONS:

17.1 Add suitable covering remarks to the referenced Instruction Book under Section 2.4 Integration Into System, Use in Service B Operation.

17.2 When the final Instruction book is delivered, correct likewise to show the EEM change. (Of course this note must be shown as affecting only the Service B units.)

18. CORRECTIONS TO FORM FAA-198 AND FAA-416 DATA:

18.1 Not applicable to Form FAA-198.

18.2 Enter under remarks on Form FAA-416: "Modified in accordance with EEM NO. 647."

19. COORDINATION:

19.1 This modification has been coordinated with FM-347 and AT-200.

20. IMPLEMENTATION:

20.1 This modification is desired as soon as possible to reduce the incidence of spurious scan call relays resulting from those circumstances described above.

Paul R. Colby.
Paul R. Colby, FM-130

This modification was requested by AT-200

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 29.

February 20, 1961

ELECTRONIC EQUIPMENT MODIFICATION - APULS CA-5032 (5) - KEM NO. 669

TO : Chief, Facilities and Materiel Field
Division Nos. 1-4
Regional Manager, Regions 5 & 6

FROM : Acting Chief, Maintenance Engineering Branch, FM-130

SUBJECT: Automatic Program Unit (Low Speed) - Type CA-5032; Service A
Traffic Control Delay Elimination

1. OBJECT:

1.1 To modify APULS Unit allowing for insertion of regular between-groups delay in place of the Traffic Controlled Delay Period now in use.

2. REASON FOR MODIFICATION:

2.1 To allow for orderly relay of hourly weather information now frequently interrupted by out of sequence entries.

3. APPLICATION:

3.1 This modification shall be applied to each APULS Type CA-5032 operating on and/or assigned to Service A circuits.

4. REFERENCE:

4.1 APULS CA-5032 (serial numbers 1-125) Instruction Book per contract Cca-33957, dated June 25, 1958.

4.2 ATM-270 GENOT, Number 1/19, dated 021335.

5. MATERIALS REQUIRED:

5.1 None.

6. SOURCE OF MATERIALS:

6.1 Not applicable.

ELECTRONIC EQUIPMENT MODIFICATION - APULS CA-5032 (5) - KEM NO. 669

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Miscellaneous small hand tools.

8.2 WORK TO BE PERFORMED BY:

8.1 Maintenance personnel on units already installed.

8.2 Establishment on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 Immediately upon receipt of this modification notice for units already installed.

9.2 At time of installation (on Service A circuits) for units not already installed.

10. ESTIMATED TIME REQUIRED:

10.1 Two man-hours per APULS (36 units total to be modified.)

11. DISPOSITION OF SURPLUS PARTS:

11.1 None.

12. MODIFICATION PROCEDURE:

12.1 Remove Traffic Controlled Delay Strap.

12.2 Identify the modified APULS by a label, tag, or marking, indicating "Service A Operation Only."

13. TEST AFTER INSPECTION:

13.1 Check on-line scan operation of the APULS to determine that the regular between-groups delay at any point, is now a part of the operating cycle.

14. USE:

14.1 On all Service A circuits.

ELECTRONIC EQUIPMENT MODIFICATION - APULS CA-5032 (5) - EEM NO. 669

15. RESULTS OF MODIFICATION:

- 15.1 The Traffic Controlled Delay Period that was programmed on the APULS coding panel has been removed and the regular between-groups delay is now a part of the operating cycle.
- 15.2 Operation of the modified APULS is limited to Service A circuits.

16. CORRECTION TO DRAWINGS:

- 16.1 Correct all Service A APULS coding charts and forward corrected chart to FM-135.

17. CORRECTIONS TO INSTRUCTIONS:

- 17.1 None.

18. CORRECTIONS TO FORM FAA-198 AND FAA-416 DATA:

- 18.1 Not applicable to Form FAA-198.
- 18.2 Enter under remarks on Form FAA-416: "Modified in accordance with EEM NO. 669."

19. COORDINATION:

- 19.1 This modification has been coordinated with FM-347 and AT-200.

20. IMPLEMENTATION:

- 20.1 This modification is desired as soon as possible to improve Service A Weather Sequence Control.

Paul R. Colby.
Paul R. Colby, FM-130

This modification was requested by AT-200.
The use of Traffic Control Delay function of the Automatic Program Unit is authorized if indicated on the current APULS Programming charts for Service A circuits.

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 30.

November 20, 1961

ELECTRONIC EQUIPMENT MODIFICATION - APULS TYPE CA-5032(6)-EEM NO. 671

**SUBJECT: Automatic Program Unit (Low Speed) - Type CA-5032;
Service A Scan Improvement**

FROM : Chief, Maintenance Engineering Branch, AF-130

**TO : Assistant Administrators and Regional Managers
ATTN: Chiefs, Aviation Facilities Divisions**

1. **SUBJECT:**

1.1 To have APULS during an A-1 Scan transmit the end-of-message code, condition code, station identifier and space. During an A2 Scan transmit the same characters with the exception of the space character following the station identifier.

2. **REASON FOR MODIFICATION:**

- 2.1 To improve copy of Service A Weather information during an A-1 Scan.
- 2.2 To utilize APULS circuit to assure that the Hi-Speed Punch Unit (HRPE) is inhibited after each station is called.

3. **APPLICATION:**

3.1 This modification shall be applied to each APULS Type CA-5032, operating or assigned to Service A circuits.

4. **REFERENCES:**

4.1 APULS CA-5032 (Serial Numbers 1-126), Instruction Book per contract Cca-33957, dated June 25, 1958.

5. **MATERIALS REQUIRED:**

5.1 None.

6. **SOURCE OF MATERIAL:**

6.1 Not applicable.

ELECTRONIC EQUIPMENT MODIFICATION - APULS TYPE CA-5032(6)-KEM NO. 671

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Miscellaneous small hand tools.

8. WORK TO BE PERFORMED BY:

8.1 Maintenance personnel on units already installed.

8.2 Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 When authorized and scheduled by the cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 Sixteen man-hours per APULS unit.

11. DISPOSITION OF SURPLUS PARTS:

11.1 Not applicable.

12. MODIFICATION PROCEDURE:

12.1 Make the following changes on K-105.

- a. Remove the jumper between terminals 3L and 6L.
- b. Connect a wire from 3L to the line feed (LF) terminal on TB-101.
- c. Connect a jumper between 6L, 6R, and 3R.
- d. Connect a jumper between 9L and 9R.
- e. Disconnect the wire on terminal 20 of J-106 and connect it to 2R (K-105).
- f. Disconnect the wire on terminal 25 of J-106 and connect it to 5R (K-105).
- g. Disconnect the wire on terminal 30 of J-106 and connect it to 8R (K-105).
- h. Connect a wire on terminal 20 of J-106 to 1R (K-105).

ELECTRONIC EQUIPMENT MODIFICATION - APULS TYPE CA-5032(6)-KEM NO. 671

- i. Connect a wire on terminal 25 of J-106 to 4R (K-105).
- j. Connect a wire on terminal 30 of J-106 to 7R (K-105).
- 12.2 Disconnect the wire on terminal 6 (the wire which goes to 8R of K-103) of S-108.
- 12.3 Connect the wire disconnected in 12.2 to terminal 79 of J-106.
- 12.4 A wire was formerly connected from 9R of K-103 to terminal 37 of J-104, but was removed from terminal 37 and taped as outlined in KEM No. 640. Remove the tape and re-terminate this wire on terminal 32 of J-104.
 - 12.4.1 Remove and tape the white-brown wire on terminal 47 of J-104.
- 12.5 Reprogram the APULS as follows:
 - a. Move all station identifiers and space down to the last four positions of the program board. (Positions 7,8,9, and 10.)
 - b. Remove the automatic line feed jumper (AUTO LF).
13. **TEST AFTER MODIFICATION:**
 - 13.1 Observe the APULS output on typing reperforator to check that all groups of transmissions are correct. The space (SP) following the station identifier should be deleted during an A-2 Scan.
14. **USE:**
 - 14.1 APULS Units modified in accordance with KEM No. 671 will be used only on Service A circuits.
15. **RESULTS OF MODIFICATION:**
 - 15.1 Improved operation and efficiency of Automatic Data Interchange System.
16. **CORRECTIONS TO DRAWINGS:**
 - 16.1 Correct applicable drawings in APULS Type CA-5032 Instruction Book. (Lightly in red pencil)

ELECTRONIC EQUIPMENT MODIFICATION - APULS TYPE CA-5032(6)-EEM NO. 671

17. CORRECTIONS TO INSTRUCTIONS:

17.1 None.

18. CORRECTIONS TO FORM FAA-198 AND ACA-416 DATA:

18.1 Not applicable to Form FAA-198, except on new installations.

18.2 Enter under remarks on Form FAA-416: "Modified in accordance with EEM NO. 671."

19. COORDINATION:

19.1 This modification has been coordinated with AF-347 and AT-270.

20. IMPLEMENTATION:

20.1 This modification is desired as soon as possible to improve ADIS operation.

Paul R. Colby.

Paul R. Colby, AF-130

This modification was requested by AT-200.

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 31.

October 30, 1961

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (2)-KEM NO. 697

SUBJECT: ADIS Equipment - Sequence Detector Module Type 5044WD

FROM : Chief, Maintenance Engineering Branch, AF-130

**TO : Assistant Administrators and Regional Managers
ATTN: Chiefs, Aviation Facilities Divisions**

1. OBJECT:

1.1 To open condition code inhibit circuit to High Speed Reperforator (BRPE's) from the SEDET Module located in AC-282 for ADIS I/C and the AC-286 for the ADIS S/R sites.

2. REASON FOR MODIFICATION:

2.1 To allow multi-address traffic to be copied for diversion to other stations on the High Speed Line.

3. APPLICATION:

3.1 This modification shall be made to all SEDET units at the I/C and S/R sites.

4. REFERENCE:

4.1 Teletype Corporation's Specification 5990S, Volume I, Wiring Diagram 5044WD for Schematic Print and Volume II, Wiring Diagram 5045WD for Actual Wiring Diagram for I/C sites.

4.2 Volume I, Wiring Diagram 5217WD for Schematic and Volume II, Wiring Diagram 5218WD for Actual Prints for S/R sites.

5. MATERIAL REQUIRED:

5.1 None.

6. SOURCE OF MATERIAL:

6.1 Not applicable.

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (2)-ERM NO. 697

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Miscellaneous small hand tools.

8. WORK TO BE PERFORMED BY:

8.1 Maintenance personnel on units already installed.

8.2 Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 When scheduled by the cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 Four (4) man-hours each per ADIS I/C and S/R site.

11. DISPOSITION OF SURPLUS PARTS:

11.1 None.

12. MODIFICATION PROCEDURE:

12.1 ADIS I/C sites; locate strap #24 gage wire, 39603RM between pin M, position XZ2327, symbol HM and pin N, position XZ2321, symbol HE on Actual Wiring Diagram 5045WD, disconnect strap at pin N, position XZ2321, tape and fold back into wiring harness.

12.2 ADIS S/R sites; locate strap #24 gage wire, 3178RM between pin E and pin N, position XZ2309, symbol FK on Actual Wiring Diagram 5218WD, disconnect strap at pin N, tape and fold back into wiring harness.

13. TEST AFTER MODIFICATION:

13.1 Make a visual inspection to determine general appearance and workmanship.

13.2 Check on-line operation of BRPE for operational functions described in paragraph one.

14. USE:

14.1 On all ADIS equipment.

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (2)-EEM NO. 697

15. RESULTS OF MODIFICATION:

15.1 The High Speed Punch (BRPE) will continue to copy multi-address traffic from other I/C or S/R sites, and will not be blinded by inhibit pulses from the SEDET Module.

16. CORRECTION TO DRAWINGS:

16.1 ADIS I/C sites; Wiring Diagrams 5044WD and 5045WD. Correct lightly in red pencil.

16.2 ADIS S/R sites; Wiring Diagrams 5217WD and 5218WD. Correct lightly in red pencil.

17. CORRECTION TO INSTRUCTIONS:

17.1 Attach a copy of EEM No. 697 to Instruction Book No. 268B, Volume I.

18. CORRECTIONS TO FORM FAA-198 AND ACA-416 DATA:

18.1 Not applicable to Form 198, except on new installations.

18.2 Enter under remarks on ACA-416; "Modified in accordance with EEM No. 697."

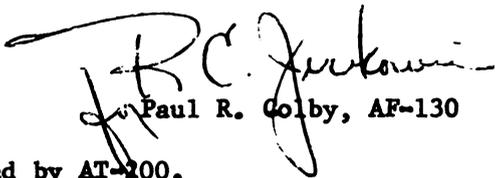
19. COORDINATION:

19.1 This modification has been coordinated with AF-347 and AT-270.

20. IMPLEMENTATION:

20.1 Immediately upon receipt of this modification on units already installed.

20.2 At the time of installation on new equipments.


Paul R. Colby, AF-130

This modification was requested by AT-200.

CHAPTER 32. ADIS EQUIPMENT HISTRAD
AND HISRED MODULES

1. OBJECT. To provide test jacks on the front panel of the High Speed Transmitter Distributor (HISTRAD) and on the front panel of the High Speed Receiving Distributor (HISRED) for Monitoring input to and output of the Digital Subset using an oscilloscope. To provide also a means of introducing a test signal to the HISRED module from a modified Digitech Word Generator for testing address selectors and other circuitry as well as for driving the DRPE unit.
2. REASONS FOR MODIFICATION. To eliminate present hazard of slipping test lead clips, shorting terminal pins of the solid state logic cards resulting in damage to components.
3. APPLICATION. This modification shall be accomplished at all Service B Data Interchange Centers.
4. REFERENCE. Teletype Corporation Specification 50115S, schematic wiring diagram 5507WD for HISTRAD and 5505WD for HISRED.
5. MATERIALS REQUIRED.
 - a. Insulated Banana Jacks eight (8) H. H. Smith Company Type 205, 5/16 mounting hole or equal.
 - b. Shielded Wire ten (10) feet, #20 gage, stranded, Beldon Type #8885 or equal.
 - c. Solder lugs eight (8).
6. SOURCE OF MATERIAL. Station stock or local purchase.
7. TOOLS REQUIRED. Miscellaneous small hand tools, one-half inch electric drill and clearance drill for 5/16 inch jack body.
8. WORK TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of this Notice.
10. ESTIMATED TIME REQUIRED. Eight (8) man hours per BDIS Interchange facility.

11. DISPOSITION OF SURPLUS PARTS. None.

12. MODIFICATION PROCEDURES.

- a. Locate center line of jack mounting holes on front of HISTRAD and HISRED module front panel; measure 1-7/8 inches down from top of panel and 1-3/8 inches from each side of module; mark and drill with jack body clearance drill.
- b. Using a Dymo Label Maker or by other suitable means prepare labels; OUTPUT, TRIGGER, INPUT and GROUND.
- c. Mount jacks in holes and label same as on these modules used in the ADIS system.
- d. Reference Schematic Wiring Diagram Teletype Corporation HISTRAD 5507WD. Connect center lead of shielded cable to Pin "P" position Z1423 th other end of lead to banana jack labelled OUTPUT. Using solder lug ground shield to frame.
- e. Connect center lead of shielded cable to Pin "L" position Z1407, the other end of lead to banana jack labelled TRIGGER. Using solder lug ground shield to frame.
- f. Reference Schematic Wiring Diagram Teletype HISRED 5505WD. Connect center lead of shielded cable to Pin "B" position Z1321, the other end of the lead to banana jack labelled INPUT. Using solder lug ground shield to frame.
- g. Connect to ground the remaining jack mounted on the HISRED panel.
- h. Secure added wiring and make visual inspection to determine general appearance and workmanship.

13. TESTS AFTER MODIFICATION. Connect oscilloscope to added jacks and view input and putput to High Speed Lines.

14. USE. On all HISTRAD and HISRED modules at all BDIS Interchange Center facilities.

15. RESULTS OF MODIFICATION.

- a. Maintenance technicians will be able to use an oscilloscope for viewing High Speed Lines without pulling out module drawers and fastening test lead clips to EC card terminals.

- b. After receiving and implementing the Digitech Word Generator Modification, the maintenance technician will be able to test address selectors and other circuitry as well as be able to test and drive the DRPE unit.
16. CORRECTION TO DRAWINGS. Correct in red pencil Teletype Corporation wiring diagrams 5505WD and 5507WD.
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate and/or desirable.
18. CORRECTION TO RECORDED DATA. None. (Note: Modification was made.)

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 33.

October 31, 1961

ELECTRONIC EQUIPMENT MODIFICATION; ADIS (4)-EEM No. 699

SUBJECT: Modification to ADIS Equipment - Elimination of Priority Number One

FROM : Chief, Maintenance Engineering Branch, AF-130

TO : Assistant Administrators and Regional Managers
ATTN: Chiefs, Aviation Facilities Divisions

1. OBJECT:

1.1 To eliminate Priority Number One, End-of-Block Code and to modify CX-1 Tape Reader Malfunction Alarm Circuits to operate with change of priority block function.

2. REASON FOR MODIFICATION:

2.1 Present operational requirements do not call for the sequence collection of weather traffic to be made in three priority groups.

3. APPLICATION:

3.1 This modification shall be made to all ADIS Equipment operating in I/C sites.

4. REFERENCE:

4.1 To eliminate No. 1 Priority, see Teletype Corporation specification 5990S, Vol. #1, wiring diagram 5017WD, Position Z-6103, EC-359, and 5990S, Vol. #2, actual wiring diagram 5018WD.

4.2 To correct CX-1 Tape Reader Malfunction Alarm Circuit, see Teletype Corporation specification 5990S Vol. #1 wiring diagram number 5029WD, ARC "H" position K-1121 and 5990S Vol. #2 actual wiring diagram 5030WD.

5. MATERIAL REQUIRED:

5.1 None.

6. SOURCE OF MATERIAL:

6.1 Not applicable.

October 31, 1961

ELECTRONIC EQUIPMENT MODIFICATION; ADIS (4)-EEM NO. 699

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Miscellaneous small hand tools.

8. WORK TO BE PERFORMED BY:

8.1 Maintenance Personnel on units already installed.

8.2 Establishment Personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 When scheduled by cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 Four (4) man-hours per ADIS I/C and S/R site.

11. DISPOSITION OF SURPLUS PARTS:

11.1 None.

12. MODIFICATION PROCEDURE:

12.1 Locate green lead going from Pin "K", position XZ6103, symbol FC to Pin "E", position XZ6125, symbol HK on actual wiring diagram 5018WD, disconnect green lead at Pin "E", position XZ6125, tape and fold back into harness.

12.2 Strap Pin "E", position XZ6125 to Pin "J" of position XZ6125, using strapping wire 39603RM #24 gage or equal.

12.3 Locate terminals #2 and #3 of ARC "H" position K-1121, symbol W on actual wiring diagram 5030WD. Strap terminal #2 and #3 using strapping wire 39603RM #24 gage or equal.

13. TEST AFTER MODIFICATION:

13.1 Make an inspection to determine general appearance and workmanship.

13.2 Check operation of AFUHS Scan for the elimination of Priority Number One End-of-Block Code and for proper operation of CX-1 Tape Reader Malfunction Alarm Circuit.

ELECTRONIC EQUIPMENT MODIFICATION; ADIS (4)-EEM NO. 699

14. USE:

14.1 At all ADIS Equipment I/C sites.

15. RESULTS OF MODIFICATION:

15.1 Number One Priority Circuit is disabled and the CX-1 Tape Reader Malfunction Alarm Circuit has been modified to operate on Priority Two and Three.

16. CORRECTION TO DRAWINGS:

16.1 Correct in red pencil (lightly) schematic wiring diagram Numbers 5017WD and 5029WD of specification 5990S, Vol. #1.

16.2 Correct in red pencil (lightly) actual wiring diagram Numbers 5018WD and 5020WD of specification 5990S, Vol. #2.

17. CORRECTION TO INSTRUCTIONS:

17.1 Attach copy of EEM 699 to Instruction Book No. 286B, Vol. #1.

18. CORRECTIONS TO FAA FORM-198 AND ACA-416 DATA:

18.1 Not applicable to Form FAA-198, except on new installations.

18.2 Enter under remarks on Form FAA-416: "Modified in accordance with EEM 699".

19. COORDINATION:

19.1 This modification has been coordinated with AF-347 and AT-270.

20. IMPLEMENTATION:

20.1 Immediately on receipt of this modification for units already installed.

20.2 At the time of installation on new equipments.


Paul R. Colby, AF-130

This modification has been requested by AT-200.

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 34.

November 14, 1961

ELECTRONIC EQUIPMENT MODIFICATION: ADIS (6) - EEM NO. 701

SUBJECT: ADIS Equipment - Improve Testing Facilities

FROM : Chief, Maintenance Engineering Branch, AF-130

TO : Assistant Administrators and Regional Managers
ATTN: Chiefs, Aviation Facilities Divisions

1. OBJECT:

1.1 To provide a means of adjusting the ADIS - Area, Supplemental and Local, and Dummy test circuit bias current.

2. REASON FOR MODIFICATION:

2.1 With the present fixed resistor-bias current-circuit, different loading under test conditions will vary the bias current from 50 ma. to 75 ma., thereby, not letting the test equipment work on a test circuit of 62 ma. as it is supposed to be tested.

3. APPLICATION:

3.1 This modification to be made on all ADIS I.C. monitor printer switching cabinets. (Type AC-290)

4. REFERENCES:

4.1 Teletype Corporation ADIS Equipment actual wiring prints 5990S, Vol. #2, 5174WD.

5. MATERIALS REQUIRED:

5.1 Three 2500 ohm, 125V, 25W, slide type, variable resistors with mounting (Type: CLAROSTAT Power series-25, 2500 ohm #645-387 or equal.)

5.2 Six inches of #22 solid wire.

6. SOURCE OF MATERIALS:

6.1 Local stock or local purchase.

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Miscellaneous small hand tools.

8. WORK TO BE PERFORMED BY:

8.1 Maintenance personnel on units already installed.

8.2 Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 When authorized and scheduled by the cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 Four (4) man-hours per I/C site.

11. DISPOSITION OF SURPLUS PARTS:

11.1 Place in local stock.

12. MODIFICATION PROCEDURE:

12.1 Remove the fuse on the Dummy circuit power supply, Teletype Part No. 162361, while making this modification.

12.2 Remove screws holding the three fixed resistors, Teletype Part No. 153481, in place.

12.3 Mount the three variable slide resistors vertically where the three (3) fixed resistors were removed.

12.4 Remove black wire which is common to all three fixed resistors and connect it such that it is common to the center arm of all three variable resistors.

12.5 Remove the colored wires from the bottom fixed resistor and place on the fixed side of the bottom variable resistor. Repeat above sequence for the middle and top resistors.

13. RESULT OF MODIFICATION:

13.1 The installation of the variable slide resistors will allow adjustment of the area test circuit bias current (bottom), supplemental and local test circuit bias current (middle), and the local dummy test circuit bias current (top).

14. CORRECTIONS TO DRAWINGS:

14.1 Correct monitor printer switching cabinet actual drawing to show variable resistors. (See 5990S, Vol. #2, 5174WD)

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (6) - EEM NO. 701

15. CORRECTION TO INSTRUCTIONS:

- 15.1 Correct associated instructional material as appropriate and/or desirable.
- 15.2 Make correction to Bulletin No. 1179B, Parts List, pages 1-9. Show 2500 ohm, 25 watt variable Slide Resistor Clarostate Power Series-25 or equal, in place of fixed resistor, Part #153481, shown on subject list.

16. CORRECTION TO FORM-198 DATA AND ACA-416:

- 16.1 Not applicable to Form-198 data, except on new installations.
- 16.2 Enter under remarks on ACA-416: "Modified in accordance with EEM No. 701."

17. USE:

- 17.1 At all ADIS I/C Sites.

18. COORDINATION:

- 18.1 This modification has been coordinated with AF-347 and AT-270.

19. TEST AFTER MODIFICATION:

- 19.1 Adjust the variable resistors until the three test circuits have a bias current reading of 62 ma.

20. IMPLEMENTATION:

- 20.1 Immediately on receipt of this modification for units already installed.
- 20.2 At time of installation on new equipments.


Paul R. Colby, AF-130

This modification was requested
by Region Two.

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 35.

October 30, 1961

ELECTRONIC EQUIPMENT MODIFICATION; ADIS (7)-EEM NO. 702

SUBJECT: ADIS Equipment - APUHS 2, Priority Character Generator;
Type AC281 Cabinet

FROM : Chief, Maintenance Engineering Branch, AF-130

TO : Assistant Administrators and Regional Managers
ATTN: Chiefs, Aviation Facilities Divisions

1. OBJECT:

1.1 To wire Automatic Program Unit High Speed Scan to include the "F" calls.

2. REASON FOR MODIFICATION:

2.1 To complete wiring of the APUHS scanning unit to call in all S/R sites and other I/C sites on the scheduled A-2 Scan.

3. APPLICATION:

3.1 This modification shall be made to all operating ADIS Control I/C Sites (MKC-FIW).

4. REFERENCE:

4.1 Teletype Corporation Specification 5990S, Vol. #2 actual wiring diagram 5030WD, Symbol W, Position K-1121.

4.2 5990S, Vol. #1, schematic wiring diagram 5029, position K-1121.

5. MATERIAL REQUIRED:

5.1 Jumper STRAPS #24 gage wire, (39603RM or equal).

6. SOURCE OF MATERIAL:

6.1 Local Stock.

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Miscellaneous small hand tools.

ELECTRONIC EQUIPMENT MODIFICATION; ADIS (7)-EEM NO. 702

8. WORK TO BE PERFORMED BY:

8.1 Maintenance Personnel on units already installed.

8.2 Establishment Personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 When scheduled by the cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 Four (4) man-hours per ADIS Control I/C site.

11. DISPOSITION OF SURPLUS PARTS:

11.1 None.

12. MODIFICATION PROCEDURE:

12.1 Locate position K-1121, symbol W on 5030WD and remove jumper strap between terminals 3 and 6 (if present) and provide strap between terminals 3 and 7 of ARC-A.

12.2 Position K-1121, Symbol W, locate and remove strap between Terminals 6 and 7. Provide strap between Terminals 5 and 6 of ARC-A.

12.3 Position K-1121, Symbol W; locate terminals 5 and 6 of ARC-B, strap.

12.4 Position K-1121, Symbol W; locate terminals 5 and 6 of ARC-C, strap.

12.5 Position K-1121, Symbol W; locate terminals 3 and 6 of ARC-D, strap.

12.6 Position K-1121, Symbol W; locate terminals 4 and 6 of ARC-E, strap.

12.7 Position K-1121, Symbol W; locate terminals 5 and 6 of ARC-F, strap.

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- 3 -

ELECTRONIC EQUIPMENT MODIFICATION; ADIS (7)-EEM NO. 702

- 12.8 Position K-1121, Symbol W; locate terminals 5 & 6 of ARC-K, strap.
- 12.9 Position K-1121, Symbol W; locate terminals 5 & 6 of ARC-L, strap.
- 13. **TEST AFTER MODIFICATION:**
 - 13.1 Make a visual inspection to determine general appearance and workmanship.
 - 13.2 Check on-line operation to insure that all High Speed Scan Alarm functions (lamps and buzzer) are operating correctly.
- 14. **USE:**
 - 14.1 On all ADIS I/C Control sites.
- 15. **RESULTS OF MODIFICATION:**
 - 15.1 The "F" station identifiers at each ADIS I/C and S/R site will now be scanned during the APUHS A2 scan. The alarm circuits have been modified to indicate malfunction conditions.
- 16. **CORRECTION TO DRAWINGS:**
 - 16.1 Correct (lightly) in colored pencil, the schematic wiring diagram No. 5029WD in Specification No. 5990S, Vol. No. 1.
 - 16.2 Correct (lightly) in colored pencil, the actual wiring diagram No. 5030WD in Specification No. 5990S, Vol. No. 2.
- 17. **CORRECTION TO INSTRUCTIONS:**
 - 17.1 Attach copy of EEM No. 702 to Instruction Book No. 268B, Vol. No. 1.
- 18. **CORRECTIONS TO FORM FAA-198 AND ACA-416 DATA:**
 - 18.1 Not applicable to Form 198 data, except on new installations.
 - 18.2 Enter under remarks on ACA-416: "Modified in accordance with EEM No. 702."

ELECTRONIC EQUIPMENT MODIFICATION; ADIS (7)-EEM NO. 702

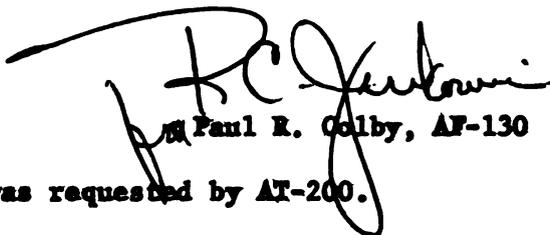
19. **COORDINATION:**

19.1 This modification has been coordinated with AF-347 and AT-270.

20. **IMPLEMENTATION:**

20.1 Immediately upon receipt of this modification on units already installed.

20.2 At time of installation on new equipments.


Paul R. Colby, AF-130

This modification was requested by AT-200.

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

December 12, 1961

CHAPTER 36.

ELECTRONIC EQUIPMENT MODIFICATION NO. 703; ADIS (8)

SUBJECT: Automatic Program Unit - APUHS 2 Priority Character Generator;
Type AC-281 Cabinet

FROM : Chief, Maintenance Engineering Branch, AF-130

TO : Assistant Administrators, All Regions
ATTN: Chiefs, Aviation Facilities Divisions

1. OBJECT:

1.1 To eliminate P, O and R calls on the D, E and F high speed scans.

2. REASON FOR MODIFICATION:

2.1 To reduce the amount of time required to scan the high speed circuit.

3. APPLICATION:

3.1 This modification shall be made to all operating ADIS Control I/C Sites (MKC - FTW).

4. REFERENCES:

4.1 Teletype Corporation portfolio of ADIS schematic wiring diagrams, specification 5029WD, Vol: No 1, K-1121, ARC L.

4.2 Teletype Corporation portfolio of ADIS actual wiring diagrams, specification 5990S, Vol. II, wiring diagram 5030WD K-1121 ARC contacts Symbol W.

5. MATERIAL REQUIRED:

5.1 Jumper straps #24 gage wire (31671RM or equal).

6. SOURCE OF MATERIAL:

6.1 Local stock.

ELECTRONIC EQUIPMENT MODIFICATION NO. 703; ADIS (8)

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Standard station teletypewriter tool kit.

8. WORK TO BE PERFORMED BY:

8.1 Maintenance Personnel on installed equipment.

8.2 Establishment Personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 When scheduled by the cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 Two man-hours per ADIS I/C Control Site.

11. DISPOSITION OF SURPLUS PARTS:

11.1 Not applicable.

12. MODIFICATION PROCEDURE:

12.1 Locate positions K-1121, ARC L and provide a strap between Terminals #3 and #4.

12.2 Locate position K-1117 and remove wire from Terminal #18 of ARC K, tape and secure to wiring harness.

13. TEST AFTER MODIFICATION:

13.1 The APUHS scan should be checked. The A, B, D, E, and F scans should call all 15 stations (A through O). The P, O, and R calls on the D, E and F scans should be eliminated.

14. USE:

14.1 At all ADIS I/C Control Sites (MKC-FTW).

15. RESULTS OF MODIFICATION:

15.1 The P, Q, and R calls on the D, E, and F scans should now be eliminated.

6170.1
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ELECTRONIC EQUIPMENT MODIFICATION NO. 703; ADIS (8)

16. CORRECTIONS TO DRAWINGS:

- 16.1 Correct (lightly) in colored pencil schematic wiring diagram 5029WD in portfolio 5990S, Vol. #1.
- 16.2 Correct (lightly) in colored pencil actual wiring diagram 5030WD in portfolio 5990S, Vol. #2.

17. CORRECTION TO INSTRUCTIONS:

- 17.1 Correct associated instructional material as appropriate and/or desirable.

18. CORRECTIONS TO FORM FAA-198 AND ACA-416 DATA:

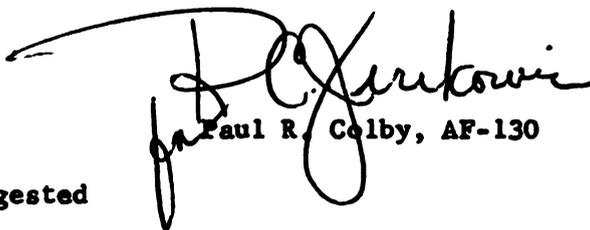
- 18.1 Not applicable to Form-198 data, except on new installations.
- 18.2 Enter under remarks on ACA-416: "Modified in accordance with EEM Number 703".

19. COORDINATION:

- 19.1 This modification has been coordinated with AF-347 and AT-270.

20. IMPLEMENTATION:

- 20.1 Upon receipt of EEM on installed equipment.
- 20.2 At time of installation on new equipment.


Paul R. Colby, AF-130

This modification was suggested
by CE-410.

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 37.

January 3, 1962

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (12) - EEM NO. 705

SUBJECT: ADIS - APUHS Monitor Improvement; Type AC-281 Cabinet

FROM : Chief, Maintenance Engineering Branch, AF-130

**TO : Assistant Administrators, All Regions
ATTN: Chiefs, Aviation Facilities Divisions**

1. OBJECT:

1.1 Use of the APUHS Monitor in scanning the D, E and F calls.

2. REASON FOR MODIFICATION:

2.1 At the present time there is no visual indication of station response to the D, E and F scan calls.

3. APPLICATION:

3.1 This modification shall be accomplished on the APUHS modules at each ADIS I/C Control Site (MKC-FIW).

4. REFERENCES:

4.1 Teletype Corporation portfolio of ADIS Schematic Wiring Diagrams, Specifications 5990S, Volume I, 5029WD.

4.2 Teletype Corporation portfolio of ADIS Actual Wiring Diagrams, Specifications 5990S, Volume II, Wiring Diagram 5030WD.

5. MATERIAL REQUIRED:

5.1 Jumper straps #24 gauge wire (31671RM or equal.)

6. SOURCE OF MATERIAL:

6.1 Local stock.

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Standard station teletypewriter tool kit.

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (12) - EEM NO. 705

8. WORK TO BE PERFORMED BY:

8.1 Maintenance personnel on installed equipment.

8.2 Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 When scheduled by the cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 Four man-hours per ADIS I/C Control Site.

11. DISPOSITION OF SURPLUS PARTS:

11.1 Not applicable.

12. MODIFICATION PROCEDURE:

12.1 Locate ARC-H of K-1121 and remove jumper between terminals 2 and 3.

12.2 Connect a jumper between terminals 1 and 4 of ARC-H.

12.3 Connect a jumper between terminals 2 and 5 of ARC-H.

12.4 Connect a jumper between terminals 3 and 6 of ARC-H.

13. TEST AFTER MODIFICATION:

13.1 Make a visual inspection to determine the general appearance and workmanship.

13.2 Conduct an unscheduled high speed scan in the test circuit position. The three rows of monitor lights on the AC-281 cabinet should give a visual indication of the D, E and F calls.

14. USE:

14.1 At all ADIS I/C Control Sites. (MKC-FTW)

ELECTRONIC EQUIPMENT MODIFICATION -ADIS (12) - EEM NO. 705

15. RESULTS OF MODIFICATION:

- 15.1 A visual indication of the D, E and F scan calls is obtained. The Operations personnel will be able to determine what station is being called and if it responds correctly.

16. CORRECTIONS TO DRAWINGS:

- 16.1 Correct (lightly) in colored pencil, Schematic Wiring Diagrams 5029WD in portfolio 59909, Volume I.
- 16.2 Correct (lightly) in colored pencil, Actual Wiring Diagram 5030WD in portfolio 5990S, Volume II.

17. CORRECTION TO INSTRUCTIONS:

- 17.1 Correct associated instructional material as appropriate and/or desirable.

18. CORRECTIONS TO FORM-198 AND ACA-416 DATA:

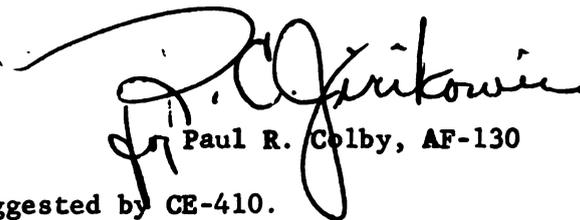
- 18.1 Not applicable to Form 198 data, except on new installations.
- 18.2 Enter under remarks in ACA-416: "Modified in accordance with EEM No. 705."

19. COORDINATION:

- 19.1 This modification has been coordinated with AF-347 and AT-270

20. IMPLEMENTATION:

- 20.1 Upon receipt of EEM on installed equipment.
- 20.2 At time of installation on new equipment.


Paul R. Colby, AF-130

This modification was suggested by CE-410.

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 38.

August 7, 1961

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER M28(12)-EEM NO. 739

TO : Assistant Administrator, Eastern Region
Regional Managers, SW, CE, WE, AL, HA, Regions
ATTN: Chiefs, Facilities and Materiel Field Divisions,
FM-1000, -2000, -3000, -4000, -5000, -6000

FROM : Chief, Maintenance Engineering Branch, AF-130

SUBJECT: M28 Page Printer Stunt Box; Area B Circuit No. 9268 - All
Circuit Code Change

1. OBJECT:

1.01 To provide change to existing M28 Page Printer Stunt Boxes on the Chicago Area B circuit for recognition of the code combination XGC as the All Circuit Call.

2. REASON FOR MODIFICATION:

2.01 To prevent the M28 Page Printer operating on circuit No. 9268 from responding to the Cape Girardeau FSS call of XCGI. At the present time, printers on this circuit are coming out of "Print Suppression", copying the message and returning to "Print Suppression" on receipt of the EOM code. This procedure has unnecessarily increased the work load of the Operations personnel on the Chicago circuit.

3. APPLICATION:

3.01 This modification shall be applied to each M28 Stunt Box operating on and/or assigned to the Chicago Area "B" circuit No. 9268.

4. REFERENCE:

4.01 Applicable Washington Office sketch showing M28 Stunt Box Arrangement for Service B Teletypewriter System.

5. MATERIAL REQUIRED:

5.01 None.

6. SOURCE OF MATERIALS:

6.1 Not applicable.

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER M28(12)-KEM NO. 739

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.01 Standard station teletypewriter tool set.

8. WORK TO BE PERFORMED BY:

8.01 Maintenance personnel on existing operating equipment.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.01 As scheduled by cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.01 Two man-hours per unit.

11. DISPOSITION OF SURPLUS PARTS:

11.01 None.

12. MODIFICATION PROCEDURE:

12.01 Locate XGC function bars and remove from stunt box.

12.02 Using same function bars, reinstall in stunt box for recognition of the XGC code combination.

13. TEST AFTER INSPECTION:

13.01 Check on line operation of the M28 Teletypewriter to assure that the machine will respond to the XGC call.

14. USE:

14.01 On all M28 Page Printer Stunt Boxes operating on circuit No. 9268.

15. RESULT OF MODIFICATION:

15.01 M28 Page Printer Stunt Boxes will not respond to Cape Girardeau call of XCGI.

16. CORRECTION TO DRAWINGS:

16.01 None.

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ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER M28(12)-EEM NO. 739

17. CORRECTION TO INSTRUCTIONS:

17.01 Not applicable.

18. CORRECTION TO FORM FAA-198 AND FAA-416 DATA:

18.01 Not applicable to Form FAA-198.

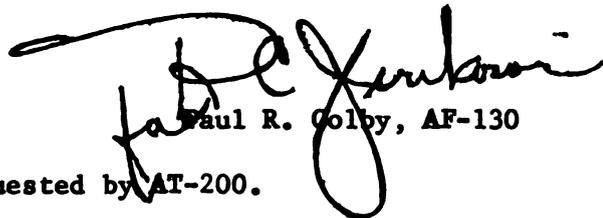
18.02 Enter under remarks on Form FAA-416: "Modified in accordance with EEM No. 739."

19. COORDINATION:

19.01 This modification has been coordinated with AF-300 and AT-200.

20. IMPLEMENTATION:

20.01 This modification will be implemented by a GENOT issued by AT-200.


Paul R. Colby, AF-130

This modification was requested by AT-200.

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 39.

January 9, 1962

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (13) - EEM NO. 740

SUBJECT: ADIS Equipment - Service A Circuit Improvement

FROM : Chief, Maintenance Engineering Branch, AF-130

**TO : Assistant Administrators, All Regions
ATTN: Chiefs, Aviation Facilities Divisions**

1. OBJECT:

- 1.1 To provide a method for a ADIS control facility to store on tape (using a spare H/L unit) traffic transmitted during high speed circuit line-up periods.
- 1.2 To provide a method for re-transmitting stored data into the high speed circuit following the circuit line-up period.
- 1.3 To provide a method of inhibiting the BRPE's at all ADIS I/C and S/R sites to avoid duplication during the time of transmission of data.

2. REASON FOR MODIFICATION:

- 2.1 During the circuit line-up of each high speed leg out of Kansas City, the ADIS S/R facilities connected to this leg are unable to receive any data. Operational requirements specify this missed traffic must be transmitted to the circuit following the circuit line-up period. This modification simplifies the procedure necessary to fulfill this requirement.

3. APPLICATION:

- 3.1 The modification procedure outlined in paragraph 12.1 shall be made only to ADIS equipment at MKC and FIW.
- 3.2 The modification procedures outlined in paragraph 12.2 shall be made to ADIS equipment at all I/C and S/R sites.

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (13) - EEM NO. 740

4. REFERENCES:

- 4.1 Teletype Corporation portfolio of Schematic Wiring Diagrams in Specification 5990S, Volume I, Wiring Diagrams 5019WD, 5038WD and 5084WD.
- 4.2 Teletype Corporation portfolio of Actual Wiring Diagrams in Specification 5990S, Volume II, Wiring Diagrams 5020WD, 5039WD and 5078WD.

5. MATERIALS REQUIRED:

- 5.1 At MKC and FTW ADIS I/C sites. Six (6) each, SPST toggle switches, Teletype Part No. 155023 or equal and hook-up wire, #24 wire gauge, stranded, polyethelene insulation or equal.
- 5.2 All other ADIS I/C and S/R sites. Two (2) each SPST toggle switches, Teletype Part No. 155023 or equal and hook-up wire, #24 wire gauge, stranded, polyethelene insulation or equal.

6. SOURCE OF MATERIALS:

- 6.1 Local stock or local purchase.

7. TOOLS OR TEST EQUIPMENT REQUIRED:

- 7.1 Miscellaneous small hand tools.

8. WORK TO BE PERFORMED BY:

- 8.1 Maintenance personnel on installed equipment.
- 8.2 Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

- 9.1 When scheduled by the cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

- 10.1 Four man-hours per ADIS I/C and S/R sites.

11. DISPOSITION OF SURPLUS PARTS:

- 11.1 None.

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (13) - KEM NO. 740

12. MODIFICATION PROCEDURE:

12.1 MKC and FTW ADIS I/C Sites:

12.1.1 Install one SPST switch in the front plate on the BRPE Control module of the No. 1 H/L unit. The switch should be located in the center (left to right) approximately 1 3/4 inches above the "Manual Tape Feed Out" switch. Orientate the switch so it is closed when the toggle is up. Label - "BRPE" - "ON" - "OFF".

12.1.2 Using hookup wire, connect one side of the switch in paragraph 12.1.1 to pin L of Z5103. Connect the other side to ground at pin C of Z5104.

12.1.3 Install a second SPST switch in the Unscheduled Register Module of No. 4 L/H unit. (This is the center module of the bottom row.) The switch should be located physically in the center of the front plate. Orientate the switch so it is closed when the toggle is up. Label - "CX" - "ON" - "OFF".

12.1.4 Using hookup wire, connect one side of the switch in paragraph 12.1.3 to pin N of Z6208. Connect the other side to ground at pin D of Z6202.

12.2 All ADIS I/C and S/R Sites:

12.2.1 Install a SPST switch in each High Speed Receiving Distributor (main and spare). The switch should be located in the center (left to right) of the module approximately 1 1/2 inches above the light indicator. Orientate the switch so it is closed when the toggle is up. Label "BRPE INHIBIT" - "ON" - "OFF".

12.2.2 Using hookup wire, connect one side on the switch in paragraph 12.2.1 to pin K of Z1326. Connect the other side to ground at pin C of Z1302.

13. TEST AFTER MODIFICATION:

13.1 MKC and FTW ADIS I/C Sites:

13.1.1 Place No. 1 H/L, No. 4 L/H and other appropriate equipment into the test circuit. Place digital subset test switch (in upper left hand corner of control cabinet) to "Remote Listen".

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (13) - EEM NO. 740

13.1.2 Place switch in BRPE control module ON. The BRPE should copy all traffic on high speed line. Turn off.

13.1.3 Place a test tape in the L/H No. 4 CX. Place switch in Unscheduled Register to "ON". The CX should transmit the test tape. Turn switch off.

13.2 All ADIS I/C and S/R Sites:

13.2.1 Place spare equipment into the test circuit. The digital subset test switch should be on "LOCAL TEST".

13.2.2 Transmit a test tape on the spare CX. The spare BRPE's should have copied the test messages.

13.2.3 Place BRPE INHIBIT Switch in the ON position and re-transmit the test tape. The BRPE's should not copy it.

14. USE:

14.1 At all ADIS I/C and S/R Sites.

15. RESULTS OF MODIFICATION:

15.1 The operational procedure of collecting and re-transmitting traffic collected during the high speed circuit line-up period has been simplified.

16. CORRECTION TO DRAWINGS:

16.1 Make correction lightly in colored pencil to all applicable Schematic and Actual Wiring Diagrams listed under paragraph 4, titled references.

17. CORRECTION TO INSTRUCTIONS:

17.1 Correct associated instructional material as appropriate and/or desirable.

17.2 Add SPST toggle switch, Teletype Part No. 155023 or equal to list of parts shown in Bulletin 1179B.

18. CORRECTIONS TO FORM FAA-198 AND ACA-416 DATA:

18.1 Not applicable to Form 198 data, except on new installations.

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ELECTRONIC EQUIPMENT MODIFICATION - ADIS (13) - EEM NO. 740

18.2 Enter under remarks on ACA-416; "Modified in Accordance with EEM No. 740."

19. COORDINATION:

19.1 This modification has been coordinated with AF-347 and AT-270.

20. IMPLEMENTATION:

20.1 Immediately on receipt of this modification for installed equipment.

20.2 At time of installation on new equipments.

Paul R. Colby.

Paul R. Colby, AF-130

This modification was requested by the Southwest Region.

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 40.

January 11, 1962

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (9) - EEM NO. 741

SUBJECT: ADIS Equipment - Word Counters, Type WC-6

FROM : Chief, Maintenance Engineering Branch, AF-130

TO : Assistant Administrators, All Regions
ATTN: Chiefs, Aviation Facilities Divisions

1. OBJECT:

1.1 To provide word counters on the low speed teletypewriter monitor circuits of the Service A Automatic Data Interchange System.

2. REASON FOR MODIFICATION:

2.1 Will supply a tool by which ATS personnel can determine how many words have been transmitted or received over a low speed circuit at any ADIS I/C site.

3. APPLICATION:

3.1 This modification shall be applied to all AC-290 teletypewriter monitor switching cabinets located at the five (5) ADIS I/C sites.

4. REFERENCES:

4.1 AF-100 memorandum to the Chief, Facilities and Materiel Field Division, Nos. 1-4, dated June 7, 1961.

4.2 Teletype Corporation's ADIS equipment, Actual Wiring Diagram 5174WD in Specification 5990S, Issue 1, Volume II.

4.3 Teletype Corporation's ADIS equipment, Schematic Wiring Diagram 5173WD in Specification 5990S, Issue 1, Volume I.

4.4 Western Apparatus Company's Word Counter WC-6, Manual No. 1, issued March 1958.

5. MATERIALS REQUIRED:

5.1 Word Counters, Western Apparatus Company, Model WC-6, amount nine per I/C site.

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (9) - EEM NO. 741

5.2 One hundred feet of #18 thermoplastic stranded wire.

6. SOURCE OF MATERIAL:

6.1 The Communications Engineering Branch, AF-340 is shipping Word Counters, WC-6 directly to the five ADIS I/C sites.

6.2 The wire will be supplied from station stock or local purchase.

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Standard station teletypewriter tool set.

8. WORK TO BE PERFORMED BY:

8.1 Maintenance personnel on existing operating equipment.

8.2 Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 As scheduled by cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 Eight man-hours per ADIS Equipment AC-290 Cabinet (one per ADIS I/C Site.)

11. DISPOSITION OF SURPLUS PARTS:

11.1 Retain jumper strap Teletype Part No. 151827 in station spare stock.

11.2 Remove factory supplied protective covers from mounting hole for Word Counters, retain in station spare stock bins.

12. MODIFICATION PROCEDURE:

12.1 Remove protective covers and mount WC-6 Word Counters, use 100WPM gears.

12.2 Check polarity of signal line terminal connections on TB7103, TB7104, TB7105 and connect Word Counters according to wiring diagram part of Manual No. 1, issued March 1958, part of Word Counter Modification Kit.

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (9) - EEM NO. 741

- 12.3 On TB7103 remove jumper straps, Teletype Part No. 151827, from terminals G1 - G2, G7 - G8 and G13 - G14, connect Word Counter in place of straps, observe polarity.
- 12.4 On TB7104 remove jumper straps, Teletype Part No. 151827, from terminals V1 - V2, V7 - V8 and V13 - V14, connect Word Counter in place of straps, observe polarity.
- 12.5 On TB7105 remove jumper straps, Teletype Part No. 151827, from terminals U1 - U2 and U7 - U8, connect Word Counter in place of straps, observe polarity.
- 12.6 The ninth Word Counter will be considered an operational maintenance spare.
13. **TEST AFTER MODIFICATION:**
 - 13.1 Make a visual inspection to determine general appearance and workmanship.
 - 13.2 Check operation of WC-6 Word Counters when M28 Printers are monitoring the low speed circuits for correct counting of characters at 100WPM operation.
14. **USE:**
 - 14.1 At all ADIS I/C sites on 100WPM (Low Speed) circuits.
15. **RESULTS OF MODIFICATION:**
 - 15.1 ATS personnel will have an accurate count of the number of characters transmitted or received over the low speed circuits.
16. **CORRECTION TO DRAWINGS:**
 - 16.1 See Teletype Corporation portfolio of Schematic Wiring Diagrams, Specification 5990S, Issue 1, Volume I and correct lightly in red pencil Schematic Wiring Diagram 5173WD.
 - 16.2 See Teletype Corporation portfolio of Actual Wiring Diagrams, Specification 5990S, Issue 1, Volume II and correct lightly in red pencil Actual Wiring Diagram 5174WD.

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (9) - EEM NO. 741

17. CORRECTION TO INSTRUCTIONS:

17.1 Correct associated instructional material as appropriate and/or desirable.

18. CORRECTIONS TO FORM FAA-198 AND FAA-416 DATA:

18.1 Not applicable to Form FAA-198, except on new installations.

18.2 Enter under remarks on ACA-416; "Modified in accordance with EEM No. 741."

19. COORDINATION:

19.1 This modification has been coordinated with AF-347 and AT-270.

20. IMPLEMENTATION:

20.1 Immediately upon receipt of this EEM on installed equipment.

Paul R. Colby.

Paul R. Colby, AF-130

This modification was requested by AT-200.

6170.1
1/14/69

FEDERAL AVIATION AGENCY

Washington 25, D. C.

CHAPTER 41.

July 6, 1961

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPE TYPE 28 (13) EEM No. 743

TO : Chief, Facilities and Materiel Field Division Nos. 1-4
FM-1000 to FM-4000
Regional Managers, Regions 5 & 6

FROM : Chief, Communications Engineering Branch

SUBJECT: Modification of M-28 Teletypewriters to Reduce Erroneous Transmissions

1. OBJECT:

1.1 To provide a means of preventing later transmission of traffic from a called station which fails to respond to its call.

2. REASON FOR MODIFICATION:

2.1 Under some operational circumstances and failure of slow release relays to react dependably, a called station will fail to transmit following a proper call, and erroneously transmit after a subsequent improper call. This results in false identification preceding the traffic, and could cause a chain reaction of erroneous transmissions by other stations awaiting calls.

3. APPLICATION:

3.1 This modification will be made on all Model 28 Teletype Equipment owned by FAA and utilized on Service A, B, C & O.

4. REFERENCES:

4.1 Teletype Bulletin 1149B change 9 Page 3-53 Figure 3-50 for parts location.

4.2 Teletype Drawing 3463WD and 3464WD for parts location and schematic diagram of the Part Number 160334 Line Monitor and Send Control Relay Group.

4.3 FAA Drawing DR-E-40026 Station Terminal Circuits for Line Monitor and Send Control.

July 6, 1961

5. MATERIALS REQUIRED:

- 5.1 Two each Teletype Stunt Box Function Bar No. 152668 for each Model 28 Teletype Equipment containing a Page Printer.
- 5.2 One each Resistor, Carbon, 1000 ohm, 2 watt for each Model 28 Teletype Equipment containing a P/N 160334 Line Monitor and Send Control Group.

6. SOURCE OF MATERIALS:

- 6.1 Parts required in Section 5.1 to be requisitioned from the Operating Materiel Branch (OMB) under the following NSC number: 04-7633.40
- 6.2 Part required in Section 5.2 to be obtained from Station Stock or Local Purchase.

7. TOOLS OR TEST EQUIPMENT REQUIRED:

- 7.1 Miscellaneous small hand tools.

8. WORK TO BE PERFORMED BY:

- 8.1 As determined by Chief, Facilities and Materiel Field Division.

9. WHEN MODIFICATION IS TO BE PERFORMED:

- 9.1 After receipt of materials by all facilities involved in this modification, and dispatch notice to all stations to effect a simultaneous change.

10. ESTIMATED TIME REQUIRED:

- 10.1 One man-hour per Teletype Equipment involved.

11. MODIFICATION PROCEDURE:

- 11.1 Remove "FIGURES" Function Bar P/N 152666 from Slot No. 6 and 11 and insert "LINE FEED" Function Bar P/N 152668 in Slot No. 6 and 11. (NOTE: In AFM Stunt Boxes change Slots 6 and 33 only.)
- 11.2 Disconnect and tape Red Lead on RS-1 Relay Coil A. Connect new 4 inch lead and one side of 1000 ohm 2 watt resistor to RS-1 Relay Coil A and solder.
- 11.3 Connect remaining end of 4 inch lead to OL Relay Spring No. 1 and solder. Connect remaining end of 1000 ohm resistor to ST Relay Coil B (Terminal with Red and White-Green lead attached) and solder.

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- 11.4 Remove and tape Black Lead on RS-1 Relay Spring No. 2. Connect new 11 inch lead from RS-1 Relay Spring No. 2 to chassis connector N19 and solder each end.
- 11.5 Strap Cabinet Terminal C59 to C78; Strap Cabinet Terminal C61 to C-27. (NOTE: It should be determined that Terminal C-27 is the switch armature termination on Stunt Box Slot No. 8 as this may vary among the different Regions.)

12. DISPOSITION OF SURPLUS PARTS:

- 12.1 Surplus parts removed in Section 11.1 should be retained in Station Stock.

13. RESULTS OF MODIFICATION:

- 13.1 When a station is called and fails to respond before subsequent transmission from another station, the end-of-message code preceding the next following station call or an open line condition will release Relay "RS-1" thereby preventing any later transmission from this station until receipt of another proper call.

14. CORRECTION TO DRAWINGS:

- 14.1 Correct FAA Drawings DR-E-40026 to show change made in Section 11.2 through 11.5.
- 14.2 Correct all applicable regional drawings.
- 14.3 Correct Teletype Drawings 3463WD and 3464WD to show change made in Section 11.2 through 11.4.

15. CORRECTIONS TO INSTRUCTIONS:

- 15.1 Not applicable

16. CORRECTION TO FORM 198 DATA AND ACA-416:

- 16.1 Not applicable to Form 198 Data.
- 16.2 Enter under remarks on ACA-416 "Modified in accordance with EEM No. 743".

17. USE:

- 17.1 Teletype Equipment modified in accordance with this EEM will be required on all Teletypewriter Circuits and services utilized within the Telecommunications System except Fliden (computer) Equipment.

July 6, 1961

18. COORDINATION:

18.1 This modification has been coordinated with the Systems Maintenance Division.

19. TEST AFTER MODIFICATION:

19.1 With equipment connected to a dummy circuit, determine that Relay "RS-1" energizes on receipt of the proper station call and immediately releases when this call is followed by the end-of-message code transmitted without delay following the station call or an open line condition occurring prior to the operation of Relay "ST".

19.2 Make a visual check of work to determine general appearance.

Thomas N. Wiley
for L. B. Blair, FM-340

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1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 42.

January 16, 1962

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (10) - EEM NO. 747

SUBJECT: ADIS Equipment - Low Speed Transmitter Distributor Unit,
Type LEXD8

FROM : Chief, Maintenance Engineering Branch, AF-130

TO : Assistant Administrators, All Regions
ATTN: Chiefs, Aviation Facilities Divisions

1. OBJECT:

1.1 To improve quality of signal being transmitted on the low speed circuits by the LEXD8, Transmitter Distributor.

2. REASON FOR MODIFICATION:

2.1 To remove excessive marking distortion presently being induced in low speed telecommunication circuits by the 186A Filter Network, Teletype Part No. 165027, connected across the contacts of the LEXD8, Transmitter Distributor.

3. APPLICATION:

3.1 This modification shall be made on all M28 LEXD8, Transmitter Distributors in the ADIS equipment at all I/C and S/R sites.

4. REFERENCES:

4.1 Teletype Corporation Schematic Wiring Diagram 3702WD, in Specification 5990S, Issue 1, Volume I.

4.2 Teletype Corporation Actual Wiring Diagram 5226WD, in Specification 5990S, Issue 1, Volume II.

5. MATERIAL REQUIRED:

5.1 One Arc Suppressor, Teletype Part No. 153631.

5.2 One piece of Vinyl tubing, Teletype Part No. 178871.

5.3 One Cable Clamp, Teletype Part No. 121247.

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (10) - EEM NO. 747

6. SOURCE OF MATERIAL:

6.1 A modification kit containing all necessary parts has been shipped to all ADIS equipment sites at no cost to FAA by Teletype Corporation.

7. TOOLS AND TEST EQUIPMENT REQUIRED:

7.1 Standard station teletypewriter tool set.

8. WORK TO BE PERFORMED BY:

8.1 Maintenance personnel on units already installed.

8.2 Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 When scheduled by cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 Twenty-four man-hours per ADIS I/C site.

10.2 Sixteen man-hours per ADIS S/R site.

11. DISPOSITION OF SURPLUS PARTS:

11.1 Place removed Arc Suppressor, Teletype Part No. 165027 and Cable Clamp, Teletype Part No. 121248 in station stock.

12. MODIFICATION PROCEDURE:

12.1 Disconnect Arc Suppressor, Teletype Part No. 165027 (symbol 186A) and Cable Clamp, Teletype Part No. 121248, from the contacts of M28 Type LEXD8, Transmitter Distributor.

12.2 Insert Arc Suppressor, Teletype Part No. 153631 (symbol 185A), into Vinyl tubing, Teletype Part No. 178871, so that the body of suppressor is insulated.

12.3 Insulate each lead of Arc Suppressor with Vinyl tubing, Teletype Part No. 178872.

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (10) - EEM NO. 747

- 12.4 Install Arc Suppressor insulated with Vinyl tubing, using Cable Clamp, Teletype Part No. 121247, in the same position as the original Arc Suppressor and Cable Clamp, reconnect new Arc Suppressor across contacts of M28 LEXD8, Transmitter Distributor.
13. **TEST AFTER MODIFICATION:**
 - 13.1 Make a visual inspection to determine general appearance and workmanship.
 - 13.2 Return modified M28 Type LEXD8, Transmitter Distributor to low speed circuit, call local Serving Company for distortion readings as produced by contacts of LEXD8.
 - 13.3 Distortion produced from contacts of modified LEXD8, on the low speed line, should be approximately the same amount as produced by the M28 LEXD4 when compared under the same operating conditions.
14. **USE:**
 - 14.1 All M28 Type LEXD8, Transmitter Distributors at all ADIS I/C and S/R sites will be modified.
15. **RESULTS OF MODIFICATION:**
 - 15.1 The signal being transmitted by the LEXD8 should now be acceptable for long line transmission. (5 to 10% marking bias)
16. **CORRECTION TO DRAWINGS:**
 - 16.1 Correct lightly in red pencil, Teletype Corporation Schematic Wiring Diagram 3702WD, and Teletype Corporation Actual Wiring Diagram 5226WD, in Specification Publication 5990S.
17. **CORRECTION TO INSTRUCTIONS:**
 - 17.1 Correct associated instructional material as appropriate and/or desirable.
18. **CORRECTIONS TO FORM FAA-198 AND FAA-416 DATA:**
 - 18.1 Not applicable to Form FAA-198, except on new installations.
 - 18.2 Enter under remarks on FAA-416; "Modified in accordance with EEM No. 747.

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (10) - EEM NO. 747

19. **COORDINATION:**

19.1 This modification has been coordinated with AF-347 and AT-270.

20. **IMPLEMENTATION:**

20.1 Immediately upon receipt of modification kit from Teletype Corporation on all M28 LBXD8 Transmitter Distributors installed as a part of ADIS I/C and S/R sites.

20.2 At the time of installation of new equipment, if inspection indicates modification was not accomplished at the factory.

Paul R. Colby.

Paul R. Colby, AF-130

This modification has been recommended by the manufacturer and concurred in by the Agency.

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FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 43.

November 1, 1961

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (11) - EEM NO. 748

SUBJECT: ADIS Equipment - Core Drive Sample Pulse Generator

FROM : Chief, Maintenance Engineering Branch, AF-130

**TO : Assistant Administrators and Regional Managers
ATTN: Chiefs, Aviation Facilities Divisions**

1. OBJECT:

1.01 To increase the amount of current to magnetic core drivers.

2. REASON FOR MODIFICATION:

2.01 To assure that station prefix characters are being read correctly, that pulse will be generated to sample core inhibitors and to drive core read-out and re-set circuits for more efficient operation.

3. APPLICATION:

3.01 This modification shall be made to all ADIS I/C cabinets AC282 and to all ADIS S/R cabinets AC282 and AC286. It will only affect logic card EC-329 in position 22229, Teletype Part No. 172329.

4. REFERENCE:

4.01 AF-340 memorandum to Regions 1-4, dated June 26, 1961.

4.02 Teletype Corporation Bulletin 268B, Volume I, page 2-68, paragraph C. 1.

4.03 Teletype Corporation Schematic Wiring Diagram 5046WD in Teletype Corporation 5990S, Issue No. 1, Volume I.

4.04 Teletype Corporation Actual Wiring Diagram 5047WD and 5016WD in Teletype Corporation 5990S, Issue No. 1, Volume II.

5. MATERIAL REQUIRED:

5.01 One 3.3K $\frac{1}{2}$ watt Input Resistor, Teletype Part No. 129851.

ELECTRONIC EQUIPMENT MODIFICATION - ADIS (11) - EEM NO. 748

6. SOURCE OF MATERIAL:

6.01 Resistors and Print for Logic Card EC 328 being shipped to ADIS Sites at no cost to FAA by Teletype Corporation.

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.01 Standard Station Teletypewriter tool set.

8. WORK TO BE PERFORMED BY:

8.01 Maintenance Personnel on units already installed.

8.02 Establishment Personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.01 When scheduled by cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.01 Four man-hours per ADIS I/C and S/R site.

11. DISPOSITION OF SURPLUS PARTS:

11.01 None.

12. MODIFICATION PROCEDURE:

12.01 Remove Logic Card EC-329 in position Z2229.

12.02 Remove existing 5.6K $\frac{1}{2}$ watt resistor, symbol R-4 Teletype Part No. 118186 from base of NPN Emitter Follower.

12.03 Replace with 3.3K $\frac{1}{2}$ watt resistor, Part No. 129851 (furnished by Teletype Corporation) in base of NPN Emitter Follower.

12.04 Identify modified Logic Card as EC-328, using pressure-sensitive labels manufactured by Allen Hollander Company, Inc., 385 Gerard Avenue, New York 51, New York or equal. Use typewriter to print Logic Card identification.

13. TEST AFTER MODIFICATION:

13.01 Make a visual inspection to determine general appearance and workmanship.

ELECTRONIC MODIFICATION - ADIS (11) - EEM NO. 748

13.02 Place modified card in position Z2229 in spare Message Director module and test for normal operation.

14. USE:

14.01 In all Message Director Groups and at all ADIS I/C and S/R sites.

15. RESULTS OF MODIFICATION:

15.01 Will improve operation of the Core Inhibitor and Core Drive Sample Pulse Generator.

16. CORRECTION TO DRAWINGS:

16.01 Correct lightly in red pencil Teletype Corporation's Schematic Wiring Diagram No. 5046 and Actual Wiring Diagram No. 5047.

16.02 EC-328 Logic Card Schematic Wiring Diagram No. 172328 will accompany resistor, new diagram to be placed in Teletype Corporation's specification folder No. 59928 with other Logic Card prints.

17. CORRECTION TO INSTRUCTIONS:

17.01 Attach copy of EEM No. 748 to Instruction Book 268B, Volume No. 1.

18. CORRECTION TO FORM FAA-198 and FAA-416 DATA:

18.01 Not applicable to Form FAA-198, except on new installations.

18.02 Enter under remarks on FAA-416; "Modified in accordance with EEM No. 748."

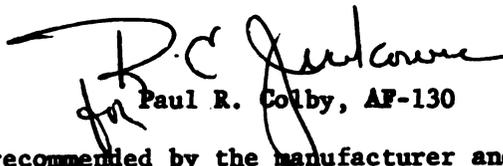
19. COORDINATION:

19.01 This modification has been coordinated with AF-340 and AT-270.

20. IMPLEMENTATION:

20.01 Immediately upon receipt of resistor from Teletype Corporation on ADIS equipment already installed.

20.02 At the time of installation of new equipment if inspection indicates modification was not accomplished at the factory.


Paul R. Colby, AF-130

This modification has been recommended by the manufacturer and concurred in by the Agency.

6170.1
1/14/69

CHAPTER 44

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 44.

March 27, 1962

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 817 - ADIS (14)

SUBJECT: Message Director - Address Selector Drawer - Teletype Part
No. 171077; Type AC-286 Cabinet

FROM : Chief, Maintenance Engineering Branch, AF-130

TO : Assistant Administrators, All Regions
ATTN: Chiefs, Aviation Facilities Divisions
Manager, Aviation Facilities Depot, AF-900
ATTN: Chief, Program Materiel Branch, AF-970
Chief, Operating Materiel Branch, AF-980
Director, Office of Personnel and Training, PT-900
ATTN: Chief, Facilities and Materiel Training Division, PT-940

1. OBJECT:

1.1 To eliminate marginal operation of Address Selector Drawer, AC-286 Cabinet at ADIS S/R stations.

2. REASON FOR MODIFICATION:

2.1 To increase core operating current under marginal conditions at S/R stations.

3. APPLICATION:

3.1 This modification shall be made to all ADIS S/R Address Selector Drawer Modules.

4. REFERENCES:

4.1 Teletype Corporation portfolio of ADIS Actual Wiring Diagrams Specification No. 5990S, Volume II, Wiring Diagram No. 5101WD for Address Selector Drawer Module.

4.2 Teletype Corporation Bulletin 268B, Volume I, page 2-72 for operation of Address Selector Drawer.

4.3 Modification kit and installation instructions supplied to ADIS S/R stations by Teletype Corporation.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 817 - ADIS (14)

5. MATERIALS REQUIRED:

5.1 Modification kits containing the following items will be supplied to all S/R stations by the equipment manufacturer.

| <u>5.2 Description</u> | <u>Quantity</u> | <u>Teletype Part No.</u> |
|--|-----------------|--------------------------|
| Pulse Transformer | 1 | 171410 |
| One Ohm Resistor | 2 | 171589 |
| Flat Washer | 1 | 104804 |
| Screw (4-40) | 1 | 153817 |
| Blue Wire, #18 gauge, 18 inches long | 2 | RM31776 |
| Green Wire, #24 gauge, 10 inches long | 1 | RM31676 |
| Orange Wire, #24 gauge, 4 inches long | 1 | RM31674 |
| Purple Wire, #24 gauge, 4 inches long | 1 | RM31678 |
| Slate Wire, #24 gauge, 4 inches long | 1 | RM31679 |

5.3 One modification kit will modify one AC-286 cabinet. (ADIS S/R station has two cabinets)

6. SOURCE OF MATERIALS:

6.1 Equipment manufacturer, Teletype Corporation, 5555 Touhy Avenue, Skokie, Illinois.

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Standard station teletypewriter tool kit.

8. WORK TO BE PERFORMED BY:

8.1 Maintenance personnel on installed equipment.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 817 - ADIS (14)

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 When scheduled by the cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 Four man-hours per ADIS S/R station.

11. DISPOSITION OF SURPLUS PARTS:

11.1 Not applicable.

12. MODIFICATION PROCEDURE:

12.1 Remove message director from operating circuit.

12.2 Turn off all power supplies in the AC-286 cabinet.

12.3 Remove bakelite cover from right side of Address Selector Drawer, Teletype Part No. 171097. (vertical drawer in extreme right side of AC-286 cabinet)

12.4 Mount pulse transformer, Teletype Part No. 171410, behind the terminal board labeled G, using the mounting hole provided in the bakelite strip with the 4-40 screw, Teletype Part No. 153517 and flat washer, Teletype Part No. 104804 supplied in kit.

12.5 Mount two one ohm resistors, Teletype Part No. 171589 on the terminal board labeled G on FIG. 1.

12.6 Wire in pulse to transformer, Teletype Part No. 171410 labled Z, as shown on FIG. 1.

13. TEST AFTER MODIFICATION:

13.1 Test operation of module 171097 Address Selector Drawer in off-line position, if satisfactory place modified Address Selector Drawer on-line and continue observation.

14. USE:

14.1 At all ADIS S/R stations with the exception of Birmingham and Portland centers, the equipment for these stations has been modified at the factory.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 817 - ADIS (14)

15. RESULT OF MODIFICATION:

15.1 The operating current of the read-out, reset and inhibit pulses has been increased by the addition of the second pulse transformer, thus reducing the probability of erroneous operation of the Address Selector Drawer under marginal operating conditions.

16. CORRECTIONS TO DRAWINGS:

16.1 Paste FIG. 1 to upper left hand corner of wiring diagram 5101WD of specification 5990S, Volume II.

17. CORRECTIONS TO INSTRUCTIONS:

17.1 Correct associated instructional material as appropriate and/or desirable.

17.2 List parts on page 2-2 of original Bulletin 1179B. The pulse transformer and associated parts are not shown in parts Bulletin. The omission of these parts will be corrected in revision one to Bulletin 1179B, to be published by the manufacturer in the near future.

17.3 Attach copy of EEM No. 817 to Teletype Corporation Bulletin 268B, Volumes #1 and #2.

18. CORRECTIONS TO FAA FORMS 198 AND 416 DATA:

18.1 Not applicable.

19. COORDINATION:

19.1 This modification has been coordinated with AF-347 and AT-270.

20. IMPLEMENTATION:

20.1 Upon receipt of EEM No. 817 on installed equipment.

20.2 EEM No. 817 and EEM No. 832 should be accomplished concurrently in order to keep man-hour requirements at a minimum.


Paul R. Colby, AF-130

Attachment:
FIG. 1

This modification was recommended by equipment manufacturer and concurred in by the Agency.

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FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 45.

February 20, 1962

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER M28(15) - EEM NO. 834

SUBJECT: M28 Reperforator - Type LPR12/ARE; Modification For Manual Tape Feed-Out Feature

FROM : Chief, Maintenance Engineering Branch, AF-130

**TO : Assistant Administrators, All Regions
ATTN: Chiefs, Aviation Facilities Divisions**

1. OBJECT:

1.1 To eliminate the pickup of extraneous letter characters, introduced by the automatic tape feed-out feature of the M28 LPR12/ARE, operating on Service "C" circuits at the relay points of Denver and Louisville.

2. REASON FOR MODIFICATION:

2.1 The extra letter characters in Service "C" traffic are increasing the circuit time required for transmission of messages from station to station, which results in inefficient operation of Service "C".

3. APPLICATION:

3.1 This modification shall be made to all M28 LPR12/ARE reperforators operating on Service "C" at Denver and Louisville.

4. REFERENCES:

4.1 Teletype Corporation, Bulletin No. 1167B, change 5, page 2-5, fig. 2-26.

4.2 Teletype Corporation, Specification Sheet No. 5889S, Issue 5, dated September 1961.

5. MATERIALS REQUIRED:

5.1 One modification kit, Teletype Corporation, Part No. 161340.

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER M28(15) - EEM NO. 834

6. SOURCE OF MATERIALS:

6.1 Sufficient quantities of Modification Kit No. 161340 will be shipped by Teletype Corporation to Louisville, Kentucky and Denver, Colorado, to modify all M28 reperforators operating on Service "C".

7. TOOLS AND TEST EQUIPMENT REQUIRED:

7.1 Standard station teletypewriter tool set.

8. WORK TO BE PERFORMED BY:

8.1 Maintenance personnel on units already installed.

8.2 Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 When scheduled by cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 Eight man-hours per LPR12/ARE unit.

11. DISPOSITION OF SURPLUS PARTS:

11.1 Retain good parts in station stock.

11.2 Discard worn parts as junk.

12. MODIFICATION PROCEDURE:

12.1 Follow step by step procedure for installation of Modification Kit, Part No. 161340, as listed in Teletype Corporation Specification No. 5889S.

12.2 For adjustments and lubrication refer to Teletype Model 28 Typing Reperforator Set Adjustment Bulletin 247B.

13. TEST AFTER MODIFICATION:

13.1 Make a visual inspection to determine general appearance and workmanship.

13.2 Check operation of the modified LPR12/ARE unit on a teletypewriter test bench, using standard teletypewriter test procedure for an M28 typing reperforator.

ELECTRONIC EQUIPMENT MODIFICATION - TELETYPEWRITER M28(15) - EEM NO. 834

14. USE:

14.1 On all Service "C" M28 typing reperforators at Denver and Louisville relay stations.

15. RESULTS OF MODIFICATION:

15.1 The modified reperforators will not reproduce extraneous letter characters. This eliminates excess circuit time consumption and provides improved Service "C" relay operation.

16. CORRECTION TO DRAWINGS:

16.1 None.

17. CORRECTIONS TO INSTRUCTIONS:

17.1 Correct associated instructional material as appropriate and/or desirable.

17.2 Attach a copy of Specification Sheet No. 5889S to appropriate section of Teletype Instruction Manual 1167B.

18. CORRECTIONS TO FORM FAA-198 AND ACA-416 DATA:

18.1 Not applicable to Form FAA-198, except on new installations.

18.2 Enter under remarks on ACA-416; "Modified in accordance with EEM No. 834."

19. COORDINATION:

19.1 This modification has been coordinated with AF-347 and AT-270.

20. IMPLEMENTATION:

20.1 Upon station receipt of Modification Kit Part No. 161340.

Paul R. Colby.

Paul R. Colby, AF-130

This modification has been requested by AT-265.

6170.1
1/14/69

FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 46.

March 9, 1962

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 847 - TELETYPEWRITER M28(16)

SUBJECT: M28 Printer Cabinet Paper Tearing Edge Guide

FROM : Chief, Maintenance Engineering Branch, AF-130

**TO : Assistant Administrators, All Regions
ATTN: Chiefs, Aviation Facilities Divisions**

1. **OBJECT:**

1.1 To provide ATS personnel with a device for tearing teletypewriter copy to a variable length.

2. **REASON FOR MODIFICATION:**

2.1 Many teletypewriter messages are very long and the operators may require only a certain portion of the printed material. The Paper Tearing Edge Guide provides a means of tearing the copy at an exact spot selected by the operator.

3. **APPLICATION:**

3.1 The Paper Tearing Edge Guide may be installed on any teletypewriter cabinet at locations where this is an operational problem.

4. **REFERENCES:**

4.1 Teletype Corporation Specification No. 50073S.

4.2 Teletype Corporation M28 Parts Bulletins 1149B (LAC) and 1169B (LAAC).

5. **MATERIALS REQUIRED:**

5.1 Modification kit, Teletype Corporation Part No. 174458.

6. **SOURCE OF MATERIALS:**

6.1 OMB.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 847 - TELETYPEWRITER M28(16)

7. TOOLS AND TEST EQUIPMENT REQUIRED:

7.1 Standard station teletypewriter tool kit.

8. WORK TO BE PERFORMED BY:

8.1 Maintenance personnel on units already installed.

8.2 Establishment personnel on new installations where required.

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 When scheduled by cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 Two man-hours per M28 LAC cabinet.

10.2 Three man-hours per M28 LAAC cabinet.

11. DISPOSITION OF SURPLUS PARTS:

11.1 Not applicable.

12. MODIFICATION PROCEDURE:

12.1 In order to mount modification kit No. 174458, the LAC or LAAC cabinet must be equipped with doors 151503 and 154436 respectively.

12.2 Follow instructions per Teletype Specification Sheet 500738 (packed with modification kits), for mounting hardware.

13. TEST AFTER MODIFICATION:

13.1 Make a visual inspection of the work to determine general appearance and workmanship.

14. USE:

14.1 This modification is optional and will be implemented at locations where the Regional Office has determined that sufficient justification exists.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 847 - TELETYPEWRITER M28(16)

15. RESULT OF MODIFICATION:

15.1 This modification will provide operating personnel with a means of cutting a single copy, 8½ inches wide, friction-fed paper, after the end of the copy has gone beyond the tearing edge of the glass plate in the cabinet. The grooves in the tear plate serve as a guide for a cutting instrument such as a pencil point, or any sharp object that can be drawn across to cut the paper.

16. CORRECTIONS TO DRAWINGS:

16.1 Not applicable.

17. CORRECTIONS TO INSTRUCTIONS:

17.1 Correct associated instructional material as appropriate and/or desirable.

17.2 Add a copy of the Teletype Corporation Specification No. 50073S to M28 Parts Bulletins 1149B and 1169B for respective cabinets LAC and LAAC.

17.3 Attach copy of EEM No. 847 to Teletype Corporation Bulletin 1149B or 1169B.

18. CORRECTIONS TO FORMS FAA 198 AND 416 DATA:

18.1 Not applicable.

19. COORDINATION:

19.1 This modification has been coordinated with AF-347 and AT-270.

20. IMPLEMENTATION:

20.1 Immediately upon receipt of this EEM on installed equipment at locations where the Regional Office has determined that sufficient justification exists.

Paul R. Colby.
Paul R. Colby, AF-130

This modification was requested
by AT-270.

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FEDERAL AVIATION AGENCY
WASHINGTON 25, D. C.

CHAPTER 47.

March 22, 1962

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 832 - ADIS (16)

SUBJECT: ADIS Equipment - Message Director (AC-282 and AC-286)

FROM : Chief, Maintenance Engineering Branch, AF-130

TO : Assistant Administrators, All Regions
ATTN: Chiefs, Aviation Facilities Divisions
Manager, Aviation Facilities Depot, AF-900
ATTN: Chief, Program Materiel Branch, AF-970
Chief, Operating Materiel Branch, AF-980
Director, Office of Personnel and Training, PT-900
ATTN: Chief, Facilities and Materiel Training Division, PT-940

1. OBJECT:

1.1 To wire in fifty (50) additional station identifiers in the ADIS Message Directors at all ADIS I/C and S/R stations.

2. REASON FOR MODIFICATION:

2.1 Although all the ADIS Message Directors are capable of detecting 1100 station identifiers, they were delivered to the field wired to detect and recognize 975 station identifiers with 125 positions for new code assignments. AT-270 has requested that 50 additional station identifiers be wired in.

3. APPLICATION:

3.1 This modification shall be made to all Address Selector Drawers, located in cabinets AC-282 and AC-286, at each ADIS I/C and S/R station.

4. REFERENCES:

4.1 Teletype Corporation Bulletin 268B, Volume No. 1, pages 2-72 thru 2-78.

4.2 Teletype Corporation Wiring Diagram 5102WD for ADIS I/C stations.

4.3 Teletype Corporation Wiring Diagram 5144WD for Core Board Assembly of both ADIS I/C and S/R stations.

4.4 Teletype Corporation Wiring Diagram 5103WD for ADIS S/R stations.

4.5 Core wiring charts supplied as part of EEM No. 832.

4.6 Plug Board and Core Board wiring diagrams supplied as part of EEM No. 832.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 832 - ADIS (16)

5. MATERIALS REQUIRED:

5.1 The wire required to wire in additional station identifiers has been furnished by the equipment manufacturer. They were in a paper bag in the storage drawer of each Message Director. The following sets of wire, complete with part number, sufficient to wire in 125 cores has been supplied. (For all Core Board and receptacle references for ADIS I/C stations, refer to 5102WD and for ADIS S/R stations refer to 5103WD.)

5.1.1 Wire Set (125 each), Part No. 171411 - tinned on both ends; to be used as the output winding of the cores.

5.1.2 Wire Set (126 each), Part No. 171459 - 3 feet long; tinned on one end only; to be used to program the three lower core boards (F,G,H) on the left side of the unwired drawer. (42 wires for each core board)

5.1.3 Wire Set (42 each), Part No. 171460 - 5 feet, 6 inches long; tinned on one end only; to be used to program cores on core board "P" and terminate on core board "H".

5.1.4 Wire Set (42 each), Part No. 171808 - 3 feet, 6 inches long; tinned on one end only; to be used on core board "E" and terminated on receptacle "K" (will not be required for this modification).

5.2 Resistors, 1 ohm one-half watt; required to build up the one and one-half ohm resistor network.

6. SOURCE OF MATERIALS:

6.1 Resistors, station stock or local purchase. (Teletype Corporation Part No. 171589 or equal)

6.2 Core Board wiring sets supplied by manufacturer.

7. TOOLS OR TEST EQUIPMENT REQUIRED:

7.1 Standard station teletypewriter tool kit.

7.2 Jig wiring, Teletype Corporation Part No. EJM 4973.

8. WORK TO BE PERFORMED BY:

8.1 Maintenance personnel on existing operating equipment.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 832 - ADIS (16)

9. WHEN MODIFICATION IS TO BE PERFORMED:

9.1 As scheduled by cognizant Regional Office authority.

10. ESTIMATED TIME REQUIRED:

10.1 One hundred and twenty (120) man-hours per ADIS I/C and S/R center.

11. DISPOSITION OF SURPLUS PARTS:

11.1 None.

12. MODIFICATION PROCEDURE:

12.1 General Information: The first block of 25 station identifiers shall be wired in to Core Board "P", Part No. 171380. (Wiring diagram 5102WD for ADIS I/C stations and wiring diagram 5103WD for ADIS S/R stations.) The second block of 25 station identifiers shall be wired in to Core Board "H", Part No. 171387 of above referenced wiring diagrams. This EEM is being written on the assumption that Core Boards No. 171380 (P) and (H) 171387 can be wired without removing the core boards from the drawer. This method is preferred, since removal of the core boards from the drawer will require additional work. IMPORTANT: If the preferred method is not feasible, the removal of the core boards from the drawer will require removing the 40 inhibit wires, labeling them, and resoldering them later. Care must be used in handling the cores and associated wiring, as it is a #28 AWG with a special insulating enamel coating. Code charts FIGS. #1 and #2 are furnished as part of EEM No. 832 to be used with Wiring Jig, Teletype Part No. EJM 4973, for identifying the cores through which inhibit wires will be threaded or cores that are to be bypassed.

The station identifiers have been listed in the desired order from top to bottom in the columns at the left of each figure. Starting with the column closest to the core board assembly, the station identifiers are placed in alternate columns. For example, the station identifiers wired from FIG. #1 will appear on the plug board identification strip in the following order: AW, BIF, CHO,....YT, 091, 092. When wired from FIG. #2, it will appear as AR, BAB, BEW,....096, 097, 098. The cores (1 through 25) are shown at the top of FIGS. #1 and #2 as they will appear when threading each inhibit wire (1 through 40). Upon completion of "threading the cores" the entire string of cores will be mounted on the core board and routed as indicated by the dashed lines. The station identifiers will then appear in the desired alphabetical order from top to bottom on the identifier strip as shown to the left of each core board.

ELECTRONIC EQUIPMENT MODIFICATION - KEM NO. 832 - ADIS (16)

12.1 Continued:

Each vertical column below the cores contains the wiring information for that core and its respective identifier. Each horizontal row, 1 through 40, corresponds to an inhibit wire that is to be connected to the terminals 1 through 40 on the core board assembly. FIG. #3 is a block diagram which shows where the forty inhibit wires originate, and has been used to determine which wires should be threaded through the cores. Wires 1 through 10 come from the fourth level of character storage and correspond to the first character of the station identifier code. Similarly, 11 through 20 correspond to the second character, 21 through 30 correspond to the third character, and 31 through 40 correspond to the fourth character.

To help clarify the explanation, the procedure used for wiring the core that detects AW will be described. In the column below the first identifier AW (FIG. #1) there are four groups of ten wires. The first group corresponds to the output of storage level four, the second group to storage level three, the third group to storage level two, and the fourth group to storage level one. Group one in this column shows the wiring of core number one for A, the first character of AW. The inhibit wires carrying current for a certain sequence of characters must all bypass the core that is to detect that sequence.

For example, in sequence AW, the first character A is determined by the first ten inhibit wires. The Baudot code for A is the number 1 and 2 bits marking, and the number 3, 4, and 5 bits spacing. Referring to FIG. #3, this means that marking inhibit wires 2 and 4 corresponding to bits 1 and 2 and spacing inhibit wires 5, 7 and 9 corresponding to bits 3, 4, and 5 will carry current when A is the first character of a sequence and must not pass through this core. Wires 1, 3, 6, 8 and 10 will not carry current, and should therefore be threaded through the core. In FIGS. #1 and #2, dots can be seen opposite inhibit wires 1, 3, 6, 8, and 10 which indicates these wires go through the cores. The second character in coding chart No. 1 is a W which is determined by wires 11 through 20. The Baudot code for W is the numbers 1, 2 and 5 bits marking and the numbers 3 and 4 bits spacing. This means that inhibit wires 12, 14, 15, 17 and 20 will carry current when a W is the second character of a sequence. Wires 11, 13, 16, 18 and 19 will not carry current and should therefore be threaded through the core.

The third character, which is a space (it should be noted that although the space character (SP) is not shown as part of the sequence, it does appear as the last character of all station identifier sequences), is determined by wires 21 through 30. The Baudot code for a space (SP) is the number 3 bit marking and numbers 1, 2, 4, and 5 bits spacing. This

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 832 - ADIS (16)

12.1 Continued:

means inhibit wires 21, 23, 26, 27 and 29 will carry current when a space is the third character of a sequence. Wires 22, 24, 25, 28 and 30 should therefore be threaded through the core.

In the case of a three letter station identifier, the third character will be determined by wires 21 through 30 and the space character will be determined by wires 31 through 40.

In the case of numerical three digit station identifier, the figures shift always proceeds the first digit. The Baudot code for a figures shift (⏏) is numbers 1, 2, 4 and 5 bits marking and number 3 bit spacing. This means that inhibit wires 2, 4, 5, 8 and 10 will carry current when the figures shift is the first character of a sequence. Wires 1, 3, 6, 7 and 9 should therefore be threaded through the core. To summarize, in preparing the coding chart for a core to detect a sequence such as AW(SP), the Baudot code for each character must be determined; and for each character, five out of the ten inhibit wires corresponding to the level of storage holding the character should be shown going through the core. In the case of a two-character station identifier, the space character (SP) is wired as the third character and all the inhibit wires corresponding to the fourth character (numbers 31 through 40) completely bypass the core.

In the case of a numerical station identifier, the figures shift (⏏) function is wired in as the first character of the sequence followed by a three digit call. Wires number 41 and 42 are the readout-reset windings and are shown going through all cores of all core board assemblies in the identical manner as indicated on coding charts, FIGS. #1 and #2.

It should be noted that a one-half ohm resistance (two one-ohm resistors in parallel) on core board symbol P, actual wiring diagram 5152WD will be removed when the cores are wired. Add one and one-half ohm network to terminals 43 and 44 of core board area "E", as all unwired core boards must have one-half ohm, one-half watt resistor wired in series with the output of pulse transformer to simulate the load of the bypassed core board. The one and one-half ohm resistor network will simulate the load of core boards G, F and E. Figure #4 shows relationship of cores and wire for the Right Drawer and FIG. #5 for the left drawer. Figure #6 shows interconnection of core board "P" No. 171380 to terminal boards "U" and "N". Figure #7 shows interconnection of core board "H", No. 171387 to terminal boards "J" and "D". It is extremely important that this relationship be rigorously followed by the technician doing the wiring.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 832 - ADIS (16)

12.1 Continued:

FIGS. #8, #9 and #10 are photographs of the jig, Teletype Part No. EJM 4973, used for wiring the cores in groups of twenty-five. In FIG. #9, the portion of the top is the base, it holds the two other portions of the jig. The section in the middle of the figure is used for holding the core board assemblies and the cores during the wiring process. The piece at the bottom of the figure is a cardboard tube (such as a cardboard mailing tube, commonly available), that has a circumference approximately equal to or larger than the height of the core wiring charts. The three portions of the jig are placed together as shown in Fig. 8, and then each inhibit wire is threaded in and around the cores in accordance with the coding chart. The inhibit wires are soldered in place to eliminate any mix-up. The technician then turns the cardboard tube and does the next wire.

After all the wires are threaded through or around the cores, the assembly is taken out of the fixture and the string of cores are folded back to fit properly on the core board assembly as shown on coding charts FIGS. #1 and #2. The string of cores is then secured to the core board with lacing twine. After mounting the core board assemblies in the drawer, refer to Teletype Corporation Wiring Diagrams 5102WD and 5152WD, and to FIGS. #4, #5, #6 and #7 of EEM No. 832, for proper connections of output wires of the core and inhibit windings.

This modification is delicate, tedious and will require careful workmanship to avoid making an error. Areas where the technician must exercise great caution in wiring core matrices:

- (a) Care must be taken in handling the cores because they are very brittle.
- (b) Caution should be taken in threading the wires not to remove the insulating enamel on the wires as the edges of the cores are very abrasive.
- (c) Caution should be taken in soldering the inhibit wires to the terminals to be sure there is a good connection and no whiskers are shorting the terminals.
- (d) Technician will remove wire jumper inter-connecting inhibit circuit on terminal 1-40, this will be accomplished at the time the cores are wired in place. All unwired core matrices "G", F and E will have jumper strap on terminals 1-40 of respective core matrices.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 832 - ADIS (16)

12.1 Continued:

(e) Because of the above mentioned problems, it is recommended that one man per region be assigned to perform this modification at all ADIS stations and be assisted by local maintenance personnel.

**12.2 Modification Procedure:
Details**

12.2.1 Removal of the first Message Director drawer (on left side facing front of cabinet).

a. Remove three plugs on rear of drawer.

b. Remove the five countersunk screws on top (front to back) of the drawer. NOTE: Two screws will have to be removed through hole provided for this purpose in the sliding track.

c. Remove four screws on bottom right side (left to right) of the drawer where the sliding track is located. NOTE: Two screws will have to be removed through the hole provided for this purpose in the sliding track.

d. The drawer can now be removed from the cabinet and placed on a workbench or table. Care should be used in handling.

12.2.2 Remove rear identification strip on both the right and left hand side of the drawer by removing the five screws holding each strip. NOTE: Each screw holds a spacer under the identification strip. Care should be taken to find these spacers since they may fall into the drawer when each screw is removed.

12.2.3 Removal of core-terminal boards and associated wiring.

a. Locate core-terminal board No. 171387 (H) (bottom board on left side) and unsolder wires from terminals 43 and 44 and mark. Unsolder the plastic insulated purple and grey wires from terminals 41 and 42 of the same board and mark for return to same terminals. These wires are to be resoldered later. Remove jumper wire connecting terminals 1 through 40 on board No. 171387. NOTE: See FIGS. #5 and #7 for terminal number locations.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 832 - ADIS (16)

12.2.3 Continued:

b. Locate core-terminal board No. 171386(G), the board above 171387 and unsolder the two wires on terminals 41 and 42 that come from the lower board No. 171387. (mark them to be returned to same terminals for resoldering later)

c. Locate core-terminal board No. 171385(F) and unsolder the wires from terminals 41 and 42 that come from the lower board No. 171386. (mark them for return to same terminals for resoldering later)

d. Remove core-terminal board Nos. 171387 and 171386 by removing the two screws holding each board.

e. Locate core-terminal board No. 171380(P), (top board right side of drawer). Remove the jumper wire connecting terminals 1 thru 40. NOTE: Care must be taken not to remove or break the plain enameled wires coming from the lower core-terminal board and soldered to these same terminals.

f. Remove the one ohm resistors (2 each), Teletype Part No. 171589, from terminals 41 and 42 of core-terminal board No. 171380. Retain these resistors for network required in 12.2.5.

g. Remove the two plastic insulated wires (green and yellow), from terminals 39 and 40 core-terminal board No. 171380. Tape and fold back in wiring harness, will not be used in this modification.

12.2.4 Wiring Cores:

a. Place drawer on large table with right side up so that core-terminal board No. 171380 is visible.

b. Remove cores from board by cutting and removing retaining twine. NOTE: Do not remove the cores from the read-out wires passing through them.

c. Place core-terminal boards and cores in jig (Teletype Part No. EJM 4973), by placing jig in line with top of drawer and core-terminal board No. 171380. (drawer should be on the left side of jig)

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 832 - ADIS (16)

12.2.4 Continued:

d. Place core-terminal board No. 171387 on the right side of jig.

e. Program the cores of board 171380 as outlined in 12.1, using the 171460 wire provided. Cut wire to the length of 5 feet, 6 inches. NOTE: All the material required for wiring has been furnished to each station as spare parts for the Message Director when equipment was delivered from the manufacturer.

f. Place wired cores back on board 171380 as outlined in instructions and lace. NOTE: Lacing will require moving core board 171380 from its mounting temporarily, so twine can be threaded through appropriate holes (see drawing 5144WD.) Align cores on boards and lace using drawings 5102WD and 5144WD as an example.

g. Tape the 42 wires going from board 171380 to 171387. Remove the receptacle brackets (3 each), on the rear of drawer and route the taped wires behind the brackets. Replace the brackets.

h. Remove the cores from board No. 171387 and place in jig with core board 171387 on the left. Place core board No. 171386 on the right of jig.

i. Using wire 171459 (3 feet long), wire the cores of board No. 171387 as outlined in 12.1, using FIGS. #1 or #2.

j. Replace wired cores on core board No. 171387, align properly and lace.

12.2.5 Replace core board Nos. 171387 and 171386 on drawer and secure with appropriate screws.

a. Resolder wires previously removed from core board No. 171387, terminals 41, 42, 43 and 44. Solder a jumper wire between 43 and 44 shorting them.

b. Resolder the two wires previously removed from core board No. 171386, terminals 41 and 42.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 832 - ADIS (16)

12.2.5 Continued:

- c. Resolder the two wires previously removed from core board No. 171385, terminals 41 and 42.
- d. Solder a $1\frac{1}{2}$ ohm resistor to 43 and 44 of core board No. 171384. Remove jumper between 43 and 44, if one is there.
- e. Remove the two insulated wires from terminals 43 and 44 of core board No. 171385 and resolder to terminals 1 and 2 of core board No. 171386.

12.2.6 Place drawer back onto the rack sliding drawer in the cabinet, using appropriate hardware. NOTE: At this time, do not replace the identifier strips removed in step 12.2.

12.2.7 Open drawer as follows:

- a. Remove the 5 screws (top to bottom) on the blank identifier strip on front right side of drawer. Remove strip.
- b. Remove the 5 screws (top to bottom) on right side of drawer front plate (where "pull out" handle is located).
- c. Remove the one screw on bottom of drawer at front end.
- d. Remove "clip-in" identifier strips (left to right) on right side of drawer.
- e. Remove following screws from right side of drawer.
 - (1) Four roundhead screws across top right side of drawer. (left to right)
 - (2) Four hexhead screws across bottom right side of drawer.
 - (3) The screws under the "clip-in" identifier strips removed in step 12.7d.
- f. Right side of drawer should now swing open. (See Drawing 5102WD)

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 832 - ADIS (16)

12.2.8 Wiring output windings of cores wired in step 12.2.4.

a. Use the 171411 wires provided. (tinned on both ends) Each core will require two turns of this wire. **NOTE:** Only one core should be wired and soldered at a time to prevent possible mix-up.

b. Using FIGS. #4 and #6 for core board "P" No. 171380, thread the output windings around each core. (2 turns) **Important:** The output winding direction determines the output pulse polarity to the diodes. Terminate and solder as shown.

c. Using FIGS. #5 and #7 for core board "H" No. 171387, thread the output windings around each core. (2 turns) (Exercise care in wire direction as in "b".) Terminate and solder as shown.

d. Determine if a #18 black insulated wire is between 32 of J (see actual drawing 5102WD) and 48 of M. If not, provide one.

13. TEST AFTER MODIFICATION:

13.1 Make a visual inspection of the work to determine general appearance and workmanship.

13.2 Replace all plugs in back of drawer and make up a "Test Tape" with the fifty (50) newly wired station identifiers. Place Message Director on the local test circuit with associated spare equipment and conduct test for calling in station identifiers.

13.3 If tests are successful, return drawer to its normal state. **NOTE:** To replace the spacers, removed in step 12.2.2, it may be helpful to use glue to hold them in place.

14. USE:

14.1 At all ADIS I/C and S/R stations.

ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 832 - ADIS (16)

15. RESULT OF MODIFICATION:

15.1 Fifty (50) additional station identifiers of two, three or four alpha numeric sequences are now available for detection and recognition of Service A traffic diversion.

16. CORRECTIONS TO DRAWINGS:

16.1 Use FIGS. #6 and #7 of attached material and correct lightly in red pencil, Teletype Corporation Actual Wiring Diagram 5102WD for ADIS I/C station, cabinet AC-282.

16.2 Use FIGS. #6 and #7 of attached material and correct lightly in red pencil, Teletype Corporation Actual Wiring Diagram 5152WD for ADIS S/R station, cabinet AC-286.

17. CORRECTIONS TO INSTRUCTIONS:

17.1 Correct associated instructional material as appropriate and/or desirable.

17.2 The standard system printed drawings will be updated by the equipment manufacturer as soon as a contract can be arranged. Subsequent distribution of the updated, newly printed drawings will be according to the initial drawing distribution of official record.

17.3 Attach copy of EEM No. 817 to Teletype Corporation Bulletin 268B, Volumes #1 and #2.

18. CORRECTIONS TO FAA FORMS 198 and 416 DATA:

18.1 Not applicable.

19. COORDINATION:

19.1 This modification has been coordinated with AF-347, AT-270 and the ADIS Primary Control Station at Kansas City, Missouri.

20. IMPLEMENTATION:

20.1 Upon receipt of this EEM on installed equipment.

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ELECTRONIC EQUIPMENT MODIFICATION - EEM NO. 832 - ADIS (16)

20. IMPLEMENTATION: Continued

20.2 Notify ADIS Primary Control Station (MKC) at Kansas City, Missouri, when EEM No. 832 has been accomplished at the I/C and S/R stations.

20.3 EEM No. 817 and EEM No. 832 should be accomplished concurrently in order to keep man-hours at a minimum.

Paul R. Colby.
Paul R. Colby, AF-130

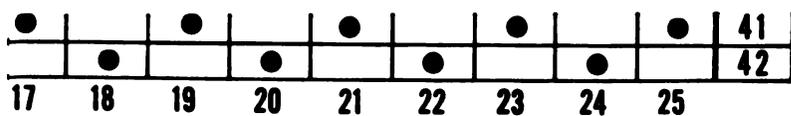
This modification was requested
by AT-265.

Attachments - 10

1. FIG. 1 Coding Chart (AW...BIF)
2. FIG. 2 Coding Chart (AR...BAB)
3. FIG. 3 Character Storage Chart
4. FIG. 4 Core Output Wiring Drawer
5. FIG. 5 Core Output Wiring Drawer
6. FIG. 6 Wiring of Board No. 171380
7. FIG. 7 Wiring of Board No. 171387
8. FIG. 8 Wiring Jig (Assembly 1)
9. FIG. 9 Wiring Jig (Broken down)
10. FIG. 10 Wiring Jig (Left and Right Core Board Holder)

10 11 12 13 14 15 16 17

NOTES WIRE GOES THROUGH CORE.
D - RM 30648.
NG TWINE RM 78808.
NUMBER 171646 CORES.
NUMBER 137471 TERMINAL.
ORE MTE (RIGHT) 171407.
H WHEN MAKING CABLE.
OSITION OF CABLE WITH CORES.
TPUT WINDINGS ARE NOT SHOWN.
DD, SPACE EVEN.



} SENSE WINDING

● NOTES WIRE GOES THROUGH CORE.
 ● ED - RM 30648.
 ● ING TWINE RM 78808.
 ● E NUMBER 171646 CORES.
 ● E NUMBER 137471 TERMINAL.
 ● CORE MTE (RIGHT) 171407.
 ● TH WHEN MAKING CABLE.
 ● POSITION OF CABLE WITH CORES.
 ● UTPUT WINDINGS ARE NOT SHOWN.
 ● DD, SPACE EVEN.

CHAPTER 48. ADIS EQUIPMENT (17)
L/H CONVERTER;
I/C STATIONS - AC-288 CABINET

1. OBJECT.

- a. To eliminate the present unsound manual method of initiating high speed data entry.
- b. To provide automatic direct high speed data entry, utilizing the CX tape reader.

2. REASON FOR MODIFICATION. This alteration renders it unnecessary for operational attendants to open the Mechanical Accessories Module drawer, with its then exposed voltage points, in order to manually set the message counter for the purpose of high speed data entry.

3. APPLICATION. This modification is applicable to all Low to High Converters.

4. REFERENCES.

- a. Teletype Corporation Specification 5990S. (Volume 1 & 2)
- b. Teletype Corporation Bulletin 1179B.
- c. Teletype Corporation Bulletin 268B. (Volume 1 & 2)

5. MATERIALS REQUIRED.

- a. Four (4) switches, Teletype Corporation part No. 171628. (Reference Bulletin 1179B)
- b. Four (4) feet of #24 wire, stranded, nylon insulation or equivalent.

6. SOURCE OF MATERIALS.

- a. Switches, Teletype Corporation part No. 171628. (Station stock or OMB)
- b. Wire, station stock or local purchase.

7. TOOLS OR TEST EQUIPMENT REQUIRED.
 - a. Miscellaneous small hand tools.
 - b. Electric drill.
 - c. Correct size drill for mounting switches.
8. WORK TO BE PERFORMED BY. Maintenance personnel at Interchange Center stations.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the cognizant regional office.
10. ESTIMATED TIME REQUIRED. Eight man-hours per ADIS I/C station.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE.
 - a. Place Low to High Converter in the test position and cut off all power.
 - b. Remove Priority Register Module from the cabinet.
 - (1) Remove front plate of the module (Teletype Corporation part No. 170511) and mount a switch (Teletype Corporation part No. 171628) by drilling a hole of the proper size, centered on the plate both horizontally and vertically.
 - (2) Replace the front plate and connect the switch, using sufficient wire for proper routing, so that when it is energized, pin "H" of EC-419 card #Z-6126 is grounded. Refer to WD-5017 for schematic diagram.
 - c. Remove the Unscheduled Register Module from the cabinet.
 - (1) Remove and discard the wire connecting J-6201 pin #19 to Z-6206 pin "C".
 - (2) Install a wire connecting J-6201 pin #19 to Z-6203 pin "K". Refer to WD-5019 for schematic diagram.
 - d. Label the switch "Priority 3 Available," in some acceptable manner.

13. TEST AFTER MODIFICATION.

- a. Make a visual inspection of the work to determine general appearance and workmanship.
- b. Return modules to the cabinet.
- c. Testing.
 - (1) Place tape in CX and turn on the power.
 - (2) Momentarily energize the switch.
 - (3) Check "Priority 3 Available" lamp, it should be on.
 - (4) Enable CX.
 - (5) After tape has read out, the CX Stop and the "Priority 3 Available" lamp should extinguish.
- d. Return unit to "Operate Circuit" and check for normal operation.

14. RESULT OF MODIFICATION.

- a. Transmissions can be made into the High Speed Line by placing a tape in a CX and momentarily energizing the "Priority 3 Available" switch. The CX will transmit the tape on the next APUHS scan, automatically stop and clear the Priority Available Register.

15. USE. At all ADIS Interchange Stations.

16. CORRECTIONS TO DRAWINGS.

- a. Correct lightly in red pencil, wiring diagram 5017WD.
- b. Correct lightly in red pencil, wiring diagram 5019WD.

17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate and/or desirable.

18. CORRECTIONS TO FAA FORMS 198 AND 416 DATA. Not applicable.

19. COORDINATION. This modification has been coordinated with AT-270, AF-347 and the ADIS Primary Control Station at Kansas City, Missouri.

20. IMPLEMENTATION.

- a. For installed equipment, upon receipt of this modification.
- b. For new equipment, at the time of installation.



**E. J. Vierling, Director
Systems Maintenance Service**

This modification was requested
by AT-265.

CHAPTER 49. MODIFICATION OF ADIS EQUIPMENT
BRPCO MODULE NO. 170580 I/C STATIONS

ADIS (15)

1. OBJECT. To provide adjustable resistance in Magnet Pulser timing circuit.
2. REASON FOR MODIFICATION.
 - a. To provide a flexible means of controlling the pulse length of the BRPE magnet pulsers.
 - b. To standardize the ADIS I/C stations BRPCO module logic card EC-396. (The ADIS S/R BRPCO module were modified at the factory prior to shipment.)
 - c. The BRPCO modules will conform to technical information and schematic wiring diagrams furnished each ADIS I/C station.
3. APPLICATION. This modification shall be made to all EC-396 logic cards at ADIS I/C stations. (144 per I/C)
4. REFERENCES.
 - a. AF-340 memorandum dated December 13, 1961.
 - b. Teletype Corporation Specification 5992S, Logic Card No. 172396, Symbol R5.
5. MATERIALS REQUIRED. One hundred and forty-four (144) 25,000 ohm (TRIMPOT) potentiometers. Teletype Corporation Part No. 171145. (One per EC-396 card.)
6. SOURCE OF MATERIALS. OMB.
7. TOOLS OR TEST EQUIPMENT REQUIRED.
 - a. Standard station tool kit.
 - b. Low wattage soldering iron.
 - c. Printed circuit card holder.

8. WORK TO BE PERFORMED BY. As programmed by the Regions.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the Regions.
10. ESTIMATED TIME REQUIRED. One hundred and fifty man-hours per ADIS I/C station.
11. DISPOSITION OF SURPLUS PARTS. Discard as obsolete for ADIS use.
12. MODIFICATION PROCEDURE.
 - a. Remove BRPCO modules, Teletype Corporation Part No. 170580 from AC-288 cabinet. (Two modules per cabinet.)
 - b. Remove EC-396 logic cards, Teletype Corporation Part No. 172396 from module. (There are six logic cards in each module.)
 - c. Remove resistor R5, 10,000 ohms from EC-396 and mount 25,000 ohm potentiometer in its place. Mounting facilities for the potentiometer are included in EC-396 card.
 - d. Replace EC-396 cards and return modules to AC-288 cabinet.
 - e. Check output of magnet pulser (EC-396, positions Z-5120 through Z-5128) using timing diagram Fig. 2-52 of Teletype Corporation Bulletin 268B.
13. TEST AFTER MODIFICATION.
 - a. Make a visual inspection of the work to determine general appearance and workmanship.
 - b. Place modified BRPCO modules and associated equipment in local test circuits.
 - (1) Conduct operational check to determine if high speed reperforator drive control is operating properly.
 - (2) Check tape out of BREE for satisfactory perforation.
14. USE. Not applicable.

15. RESULT OF MODIFICATION.

- a. All EC-396 logic cards, mounted in BRPCO modules, now have been standardized to agree with technical specification 5992S, Issue 1.
- b. A flexible means of controlling the pulse length of the BRPE magnet signals will be available at all ADIS stations.

16. CORRECTIONS TO DRAWINGS. Not applicable.

17. CORRECTIONS TO INSTRUCTIONS. Not applicable.

18. CORRECTIONS TO RECORDED DATA. None.



B. J. Vierling, Director
Systems Maintenance Service

CHAPTER 50. MODIFICATION - ADIS EQUIPMENT (19)
AC-288 AND AC-287 CABINETS
I/C AND S/R STATIONS

1. OBJECT. To provide ADIS I/C and S/R stations proper overload protection for Fan Motor and Alarm Light circuits of AC-288 and AC-289 cabinets.
2. REASON FOR MODIFICATION. PRESENT AC-288 and AC-289 cabinet Fan Motor and Alarm Light circuits are fused with a 15 amp Slo-Blow fuse. This fuse is too great to provide proper protection for the Fan Motor and Alarm Light circuitry.
3. APPLICATION. This modification shall be made to all ADIS AC-288 and AC-289 cabinets.
4. REFERENCES.
 - a. Teletype Corporation Specification 5990S.
 - (1) Actual wiring diagrams 5014WD and 5015WD for AC-288 cabinet.
 - (2) Actual wiring diagrams 5036WD and 5037WD for AC-289 cabinet.
 - b. Teletype Corporation Bulletin 1177B for cabinet parts.
5. MATERIALS REQUIRED. One fuse, 3AG type rated 1.5 amp at 200 volts, per AC-288 or AC-289 cabinet. (Teletype Corporation part No. 171644 or equal)
6. SOURCE OF MATERIALS.
 - a. Station stock or local purchase.
 - b. OMB, under Teletype Corporation part No. 171644.
7. TOOLS OR TEST EQUIPMENT REQUIRED. None.
8. WORK TO BE PERFORMED BY.
 - a. Maintenance personnel on units already installed.
 - b. Establishment personnel on new installations.

9. WHEN MODIFICATION IS TO BE PERFORMED. When scheduled by the cognizant Regional Office authority.
10. ESTIMATED TIME REQUIRED.
 - a. Six man-hours per ADIS I/C station.
 - b. One man-hour per ADIS S/R station.
11. DISPOSITION OF SURPLUS PARTS. Retain in station stock.
12. MODIFICATION PROCEDURE.
 - a. Using Teletype Corporation's Actual Wiring Diagrams listed under paragraph 4, locate symbol F-5002 on AC-288 cabinet or symbol F-6002 on AC-289 cabinet.
 - b. Remove 15A fuse presently installed in fuse holder and replace with 1.5 amp fuse. (Teletype Corporation part No. 171644)
13. TESTS AFTER MODIFICATION. Check cabinet Motor Fan and Alarm Light circuit for normal operation.
14. USE. At all ADIS I/C and S/R stations.
15. RESULTS OF MODIFICATION. The Motor Fan and Alarm Light circuits are now provided with a proper protective fuse.
16. CORRECTIONS TO DRAWINGS. Correct lightly in red pencil Specification 5990S; Actual Wiring Diagrams 5014WD, 5015WD, 5036WD and 5017WD.
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate and/or desirable.
18. CORRECTIONS TO RECORDED DATA. None.
19. COORDINATION. This modification has been coordinated with IM-140, AT-270 and Teletype Corporation.

This modification was requested by the Central Region and concurred in by the manufacturer.

The standard system printed drawings will be updated by the equipment manufacturer as soon as a contract can be arranged. Subsequent distribution of the updated, newly printed drawings will be according to the initial drawing distribution of official record.



**B. J. Vierling, Director
Systems Maintenance Service**

**CHAPTER 51. FASS (FULLY AUTOMATIC SWITCHING SYSTEM) - PLAN 59 (1)
EQUIPMENT CABINET DOOR SLIDE ASSEMBLY**

1. **OBJECT.** To prevent transmitter and reperforator compartment doors from becoming jammed, detached in service or otherwise working unsatisfactorily.
2. **REASON FOR MODIFICATION.** The original Door Slide Assemblies have been found to be unreliable; normal operations have resulted in jammed compartment doors.
3. **APPLICATION.** This modification shall be made only to the Plan 59 equipment installed at Honolulu IFSS/ATCC facility. (The Plan 59 for Balboa has been modified prior to shipment)
4. **REFERENCES.**
 - a. Western Union Telegraph Company Drawing 248777-A-8.
 - b. Western Union Telegraph Company Drawing 197612-B-8.
5. **MATERIALS REQUIRED.**
 - a. Kit, Door Slide Assembly, Western Union part No. 10597-A.
 - b. Kit, Door Slide Assembly, Western Union part No. 10597.1-A.
6. **SOURCE OF MATERIALS.** OMB.
7. **TOOLS OR TEST EQUIPMENT REQUIRED.** Standard station miscellaneous hand tools.
8. **WORK TO BE PERFORMED BY.** Maintenance personnel.
9. **WHEN MODIFICATION IS TO BE PERFORMED.** When scheduled by the cognizant regional office authority.
10. **ESTIMATED TIME REQUIRED.** Eighty (80) man-hours for Honolulu IFSS/ATCC Plan 59 System.
11. **DISPOSITION OF SURPLUS PARTS.** Discard old door slide assemblies as junk.

12. MODIFICATION PROCEDURE.

- a. Remove roller brackets, part numbers 902061 and 902363, from top and bottom of transmitter and reperforator compartment doors. Then install slide door assemblies, part numbers 10597-A and 10597.1-A, in track guide bars at top of door. Door can be installed in place by following instructions shown in Western Union Drawing No. 197612-8.
- b. Drill and tap eight (8) 8-32 holes and mount four (4) door slide assemblies, Western Union part numbers 10597-A or 10597.1-A, as specified for each cabinet.
- c. Mount guide bars (part of door slide assembly) to top of each cabinet door and peen-over each screw on the guide bar.
- d. Mount and adjust doors to each cabinet; see installation notes on attached drawing for mounting the 10597-A on the 10597.1-A kit in its associated cabinet.

13. TEST AFTER MODIFICATION.

- a. Make a visual inspection of the work to determine general appearance and workmanship.
- b. Check operation of transmitter and reperforator compartment doors, for ease of operation and satisfactory performance.

14. USE. At Honolulu IFSS/ATCC Diamond Head Plan 59 installation.

15. RESULT OF MODIFICATION. The Plan 59 transmitter and reperforator compartment doors will now open and close in a satisfactory manner.

16. CORRECTION TO DRAWINGS. Western Union drawings to applicable cabinets, shall be corrected as desirable to show installation of new Door Slide Assemblies.

17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.

18. CORRECTIONS TO RECORDED DATA. None.

19. COORDINATION. This modification has been coordinated with IM-140 and AT-270.
20. IMPLEMENTATION. Upon receipt of this modification.



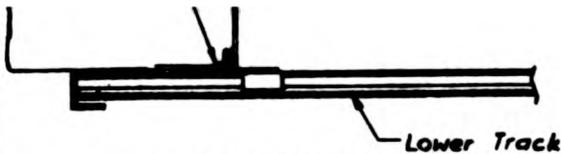
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Attachments - 2

- W.U. Drawing No. 248 777-8
- W. U. Drawing No. 197 612-8

| | | | | |
|-----------|---------|---|------------------------------|--|
| | | TOLERANCE UNLESS OTHERWISE SPECIFIED | SCALE <i>Full</i> | WESTERN UNION SWITCHING SYSTEMS 57-A, 571-A, 59-A DOOR SLIDE ASSEMBLY 10597-A AND 10597.1-A USED ON ALL CABINETS WITH XTR & REPERF. COMPARTMENTS |
| NEXT ASSY | USED ON | DECIMAL DRAWN <i>A.K</i> | FRACTIONAL <i>± 1/32"</i> | |
| MATERIAL: | | ANGULAR <i>1/2</i> | SP. ENG. <i>1/2</i> | |
| FINISH: | | DET. HOLES <i>± 1/64"</i> | ISSUE <i>1</i> | DATE A-NOV. 22, 1960 |
| | | | | DRAWING NUMBER 240 777 - 5 |

| | | | | |
|------------|---------|--|--------------------|-------------------------------|
| | | TOLEANCE UNLESS OTHERWISE SPECIFIED | SCALE | WESTERN UNION |
| NEXT ASS'Y | USED ON | | Full | |
| MATERIAL: | | DECIMAL | DRAWN A. K. | |
| | | FRACTIONAL | DES. ENG. P. J. | |
| | | ANGULAR | SP. ENG. P. J. | |
| FINISH: | | DET. HOLES | ISSUE | |
| | | ± 1/64" | DATE | |
| | | | A-NOV. 22, 1960 | DRAWING NUMBER 248 777 - 8 |



STEP-3 (Scale: 1/8" = 1")

After Pin of Slide Assembly Has Been Placed Inside of Door
Place Retaining Angle (Existing Door Release Bracket 902437) Over Pin
of Slide Assembly. This Angle Holds Door In Place In Receded or Closed Position.

NOTE: To Remove Door From Cabinet, Remove Retaining Angle With a Screw
Driver and Force Pin of Slide Assembly Backwardly Outside of Door.

| | | | | | | | |
|-----------|--|---------|--|---|--|---|---|
| NEXT ASSY | | USED ON | | TOLERANCE UNLESS OTHERWISE SPECIFIED DECIMAL FRACTIONAL ANGULAR DET. HOLES | SCALE 1 1/2" = 1" 1/8" = 1" DRAWN A.K. DES. ENG. P.J.B. SP. ENG. P.J.B. DATE AUG 28 1960 | WESTERN UNION SWITCHING SYSTEMS 57-A, 57.1-A & 59-A DOOR SLIDE ASSEMBLY 10597-A AND 10597.1-A INSTALLATION IN CABINETS DRAWING NUMBER 197 612 | 8 |
| MATERIAL: | | FINISH: | | DET. HOLES | ISSUE A-108 28 1960 | | |

CHAPTER 52. MODIFICATION - ADIS EQUIPMENT (20)
H/L CONVERTER - LEXDCO
TYPE AC-288

1. OBJECT. To eliminate the unsound methods now being used to reset K-5211 relay, after replacement of tape in the transmitter distributors associated with ADIS High to Low converters.
2. REASON FOR MODIFICATION. This alteration renders it unnecessary for operational attendants to open the LEXDCO module drawer, with its then exposed voltage points, in order to manually operate the K-5211 "LETTERS DELETE" relay.
3. APPLICATION. This modification shall be accomplished at all ADIS I/C and S/R stations.
4. REFERENCES.
 - a. Teletype Corporation Wiring Diagram 5002WD for Standard Speed Transmitter Control Module.
 - b. Teletype Corporation Wiring Diagram 5003WD for Standard Speed Transmitter Control Module.
 - c. Teletype Corporation Bulletin 268B.
5. MATERIALS REQUIRED.
 - a. Twenty-four (24) switches at each I/C station. (Teletype Corporation Part No. 171628)
 - b. Six (6) switches at each S/R station. (Teletype Corporation Part No. 171628)
6. SOURCE OF MATERIALS.
 - a. Switches, OMB. (Teletype Corporation Part No. 171628)
 - b. Wire, station stock or local purchase.
7. TOOLS OR TEST EQUIPMENT REQUIRED.
 - a. Miscellaneous small hand tools.

- b. Electric drill.
 - c. Correct size drill bit.
8. WORK TO BE PERFORMED BY.
- a. Maintenance personnel on installed equipment.
 - b. Installation personnel on new installations.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the cognizant Regional Office authority.
10. ESTIMATED TIME REQUIRED.
- a. Thirty man-hours per ADIS I/C station.
 - b. Six man-hours per ADIS S/R station.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE.
- a. Place H/L converter in test position and cut off all power.
 - b. Remove Standard Speed Transmitter Distributor Control Module (LEXDCO), Teletype Corporation Part No. 170581, from converter cabinet.
 - c. Remove front plate, Teletype Corporation Part No. 170511, from module.
 - (1) Mark center point in face of plate.
 - (2) Drill proper size hole at mark. (Exact size to be determined by particular switch part employed.)
 - (3) Mount switch. (Teletype Corporation Part No. 171628)
 - d. Reinstall front on module.
 - e. Connect switch utilizing sufficient wire for proper routing.
 - (1) Wire one side of switch to terminal 6 of K-5211 relay.
 - (2) Wire the remaining side of switch to terminal 6M of K-5211 relay.

- f. Label switch "LETTERS DELETE" using pressure sensitive tape or other suitable means.
- g. Reinstall module in converter cabinet.

13. TEST AFTER MODIFICATION.

- a. Make a visual inspection of the work to determine general appearance and workmanship.
- b. Install a test tape containing about three feet of letters code followed by a message.
- c. Start the LEXD.
 - (1) "LETTERS" should be transmitted to the line.
- d. Energize the "LETTERS DELETE" switch momentarily.
 - (1) Transmission of letters code to the line ceases.
 - (2) A series of line feeds are transmitted.
 - (3) Transmission to the line ceases.
 - (4) The tape continues to move through the LEXD.
 - (5) The tape stops when the first non-letters character is sensed. (K-5211 releases at this time)
 - (6) The LEXD is now ready to transmit the message.

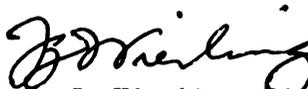
14. USE. At all ADIS I/C and S/R stations.

15. RESULT OF MODIFICATION. When tape is replaced in an LEXD, the manual operation of K-5211 relay is no longer required. The activation of the installed switch electrically operates the relay.

16. CORRECTIONS TO DRAWINGS. Correct lightly in red pencil, drawings 5002WD and 5003WD.

17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate and/or desirable.

18. CORRECTIONS TO RECORDED DATA. None.
19. COORDINATION. This modification has been coordinated with IM-147 and AT-270.
20. RECOGNITION. This modification was suggested by Southwest Region's suggestion A-142062, dated January 29, 1962.



B. J. Vierling, Director
Systems Maintenance Service

CHAPTER 54. REVISION ADIS EQUIPMENT (26)
I/C CONTROL STATION--APUHS
S/R STATIONS--SEQUENCE DETECTORS

1. OBJECT.

- a. Rearrange the ADIS S/R station scanning sequence.
- b. Eliminate the scanning of ADIS S/R stations not having transmitting requirements.

2. REASON FOR MODIFICATION. To meet revised operational requirements.

3. APPLICATION. This modification shall be accomplished at the ADIS control station Kansas City, Missouri, alternate control station Fort Worth, Texas and at effected ADIS S/R stations listed in paragraph 12 (stations having calls EA thru EJ, EN, EO, FK and FL are not effected and will appear in the call sequence in their current order).

4. REFERENCES.

- a. Teletype Corporation Specification 5990S, Drawing 5030WD, Automatic Program Unit HS-2.
- b. Teletype Corporation Specification 5990S, Drawing 5217WD, S/R Sequence Detector.
- c. Teletype Corporation Specification 5992S, Diagram 172300-18.

5. MATERIALS REQUIRED

- a. I/C control station. Two feet of hook-up wire.
- b. S/R stations. Circuit boards as listed under paragraph 12.

6. SOURCE OF MATERIALS.

- a. I/C stations -- local stock.
- b. S/R stations -- requisition from OMD in accordance with Handbook IM P 4250.2 or convert existing boards.

7. TOOLS AND/OR TEST EQUIPMENT REQUIRED. Miscellaneous hand tools.

8. WORK TO BE PERFORMED BY. Maintenance technicians at the facilities involved or as determined by the Regional Director.

9. WHEN MODIFICATION IS TO BE PERFORMED. This modification shall be performed on the spare equipment upon receipt of ADNOT from AT-300 stating time and date of implementation. The remaining equipment shall be modified after the spare equipment is placed in the operating circuit.
10. ESTIMATED TIME REQUIRED. Three man hours per I/C station. Two man hours per S/R station.
11. DISPOSITION OF SURPLUS PARTS.
 - a. I/C station -- none.
 - b. S/R station -- return the replaced circuit boards to OMD for stock in accordance with IM 4830.1 instructions.
12. MODIFICATION PROCEDURE.

I/C control stations upon receipt of ADNOT from AT-300 modify the spare APUHS as follows (reference 5030WD):

- a. Strap contacts 7, 8 and 9 of Arc L, K1117 to contact 10 of Arc L, K1117 (diagram designation item "c").
- b. At the date and time specified in the AT-300 ADNOT place the spare APUHS in the operating circuit.
- c. Perform the same strapping on the remaining APUHS.

S/R stations changes are to be accomplished in the S/R sequence detector (SEDET) module positions Z2327 and Z2328 as follows (reference 5217WD and 172300-18):

- d. Convert the circuit boards now in use to conform with the new location identifiers listed by changing the diode configurations as indicated in the Marking and Assembly Chart, Drawing 172300-18, Teletype Corporation Specification 5992S.
- e. As an alternate procedure requisition replacement circuit boards from OMD to conform with the new location identifiers listed.
- f. Notify SM-330 when you expect to be able to accomplish these changes at the S/R stations so that an effective time and date for the new scan sequence may be established.

| <u>Location</u> | <u>Present Call</u> | <u>New Call</u> | <u>Position Z2327</u> | <u>Position Z2328</u> |
|--------------------------------|---------------------|-----------------|-----------------------|-----------------------|
| New York, N.Y. | FD | EK | EC-304 | EC-310 |
| Albuquerque, N.M. | FE | EL | from Z2328 | EC-311 |
| Great Falls, Mont. | FC | EM | EC-304 | EC-312 |
| Minneapolis, Minn. | FI | FA | No change | EC-300 |
| Salt Lake City, Utah | FH | FB | No change | EC-301 |
| San Antonio, Texas | FA | FC | No change | EC-302 |
| Washington, D.C. | | | | |
| National Meteorological Center | FG | FD | No change | EC-303 |
| St. Louis, Mo. | FB | FE | No change | EC-304 |
| Phoenix, Ariz. | EK | FF | EC-305 | EC-305 |
| Houston, Texas | FN | FG | No change | EC-306 |
| Cincinnati, Ohio | FF | FH | No change | EC-307 |
| Pittsburgh, Pa. | EL | FI | EC-305 | EC-308 |
| Tulsa, Oklahoma | EM | FJ | EC-305 | EC-309 |

- g. Prior to the effective time and date indicated in the AT-300 ADNOT replace or modify the circuit boards in position Z2327 Z2328 to reflect the new call changes in the spare SEDET module.
- h. At the effective time and date place the spare SEDET in the operating circuit and replace or modify the EC cards in the remaining SEDET module.
- i. Return the replaced circuit boards in OMD for stock in accordance with Order IM 4830.1 instructions if alternate item "e" is followed. For convenience the following ordering information is provided by OMD.

| <u>EC Card</u> | <u>Teletype Corporation No.</u> | <u>FSN No.</u> |
|----------------|---------------------------------|----------------|
| EC-300(A) | 172300 | 5815-073-7901 |
| EC-301(B) | 172301 | 5815-073-7903 |
| EC-302(C) | 172302 | 5815-073-7902 |
| EC-303(D) | 172303 | 5815-073-7904 |
| EC-304(E) | 172304 | 5815-073-7905 |
| EC-305(F) | 172305 | 5815-073-7906 |
| EC-306(G) | 172306 | 5815-073-7907 |
| EC-307(H) | 172307 | 5815-546-7586 |
| EC-308(I) | 172308 | 5815-073-7910 |
| EC-309(J) | 172309 | 5815-073-7909 |
| EC-310(K) | 172310 | 5815-073-7911 |
| EC-311(L) | 172311 | 5815-073-7912 |
| EC-312(M) | 172312 | 5815-073-7913 |

13. TEST AFTER MODIFICATION. ADIS control station shall make operational tests as required to determine that the S/R stations are responding properly.
14. USE.
 - a. At ADIS control and alternate control stations.
 - b. At S/R stations listed under item 12d.
15. RESULTS OF MODIFICATION.
 - a. The APUHS scan will stop after FF Phoenix as the remaining S/R stations do not have transmitting requirements and therefore will not be called.
 - b. ADIS S/R stations are scanned in the sequence necessary to satisfy operational requirements.
16. CORRECTIONS TO DRAWINGS.
 - a. Teletype Corporation Drawing 5030WD show line connecting terminals 7, 8, 9 and 10 Arc L, K1117.
 - b. Teletype Corporation Drawing 5217WD and/or other station data. Indicate new call letter and EC card number in positions Z2327 and Z2328.
17. CORRECTIONS TO INSTRUCTIONS. Correct instructional material as appropriate and/or desirable.
18. CORRECTIONS TO RECORDED DATA. None (Note that modification has been made).

**CHAPTER 55. FASS (FULLY AUTOMATIC SWITCHING SYSTEM) - PLAN 59(2)
DIVERTER CHASSIS W. U. TYPE 9995-A; METEOROLOGICAL
CABINET LINE RECEIVING POSITION**

1. **OBJECT.** To provide EOM code (=NNNN) Line Feed four N's recognition by the Diverter Chassis 9995-A and use this signal to control the operation of the transmitter distributor (sending function) of a buffer R-T Set sending into the associated Line Receiving Position.
2. **REASON FOR MODIFICATION.** Where line speed incoming to the buffer R-T Set is lower than outgoing, the transmitter distributor tends to operate on a character by character i.e., repeatedly stopping and starting basis. Such operation is not in accordance with engineering specification margins and results in excessive mechanical wear of the transmitter control parts. This modification will provide send control actuation only upon availability of a complete message, thus reducing wear.
3. **APPLICATION.** When necessitated by Line Receiving Position speed-matching requirements and as authorized by the cognizant Regional Office.
4. **REFERENCES.**
 - a. Western Union Telegraph Company Specification #13122-A.
 - b. Western Union Telegraph Company Schematic Wiring Diagram #195496-32.
5. **MATERIAL REQUIRED.** Five feet (5) of #18 AWG stranded, polyethylene insulation or equal.
6. **SOURCE OF MATERIAL.** Station stock or local purchase.
7. **TOOLS OR TEST EQUIPMENT REQUIRED.** Standard station miscellaneous hand tools.
8. **WORK TO BE PERFORMED BY.** Regional personnel.
9. **WHEN MODIFICATION IS TO BE PERFORMED.** When scheduled by the cognizant Regional Office authority.
10. **ESTIMATED TIME REQUIRED.** Eight (8) man-hours per FASS Plan 59 Line Receiving Position.

11. DISPOSITION OF SURPLUS PARTS. Place in local station stock, the SOM Module W. U. #10049-A removed from socket S-52, and diode IN-601 symbol D1-15 removed from circuit board CB.
12. MODIFICATION PROCEDURE. Use W. U. Wiring Schematic #195496-32 and perform the following steps:
 - a. In Diverter Chassis W. U. Type 9995-A on relay MMC, remove negative 120 volt lead from contact spring 9L, tape and fold back into wiring harness.
 - b. Add a new lead from contact spring 9L of relay MMC and terminate on pin #17 of connector CP1 (mounted on rear apron of diverter chassis) following existing wiring harness path and securing new lead.
 - c. Remove lead ends of wire interconnecting pin #6 of thyatron module 10049-A, symbol S-52 and relay MMC spring contact 9R, tape ends and fold back into wiring harness.
 - d. Remove lead from spring contact 4R and connect to spring contact 9R of relay MMC.
 - e. Remove thyatron module 10049-A, symbol S-52 and diode IN-601, symbol D1-15 from diverter chassis and place in local station stock for storage.
 - f. Connect signal line of buffer R-T Set reperforator to terminals #28 and #30 of connector CP1. Relay PR1 of diverter chassis is operating in series with the receive signal line.
13. TEST AFTER MODIFICATION.
 - a. Make a visual inspection of the modified components to determine general appearance and workmanship.
 - b. Using standard ICAO format, make up a short test message. Place R-T Set and Diverter Chassis Module in a test circuit. Transmit the message and observe operation of buffer R-T Set LAXD1. Note that transmitter distributor does not start until EOM signal has energized relay MMC.

14. USE.

- a. This modification may be used at FASS Plan 59 installations where Line Receiving Position speed matching problems arise.
- b. It should be noted that this Line Receiving Position input buffer R-T Set control method permits traffic entry grouped by the interval between a received EOM and the first successive three second signal line pause (marking). Consequently, circuit operating conditions should be closely examined to insure that limiting factors will not interfere.

15. RESULTS OF MODIFICATION.

- a. A message received and reperfored at the buffer R-T Set will remain in the tape storage bin until EOM Code (\equiv NNNN) has been recognized by the associated Diverter Chassis W.U. Type 9995-A.
- b. On the Diverter Chassis 9995-A, recognition of the EOM signal causes Thyatron S-54 to fire which operates relay MMC.
- c. Relay MMC operating,
 - (1) at make contacts 8R - 10R locks up,
 - (2) at break contacts 9R - 10R removes positive 120 volt from the thyatron plate, extinguishing S-54,
 - (3) at make contacts 9L - 10L completes a circuit between pins #17 - #18 of connector CP1; this closure is used as a start control for transmitter distributor LAXD1.
 - (4) at make contacts 7L - 8L completes a circuit to meteorological connection lamp L3,
 - (5) at make contacts 6R - 7R prepares a circuit to supply a potential from V1 (timer tube) to relay MMC unlatch winding.
- d. On the Diverter Chassis Type 9995-A, the first following three second idle (marking) signal line condition is recognized by a timing circuit. When signal line receive relay PR1 armature is on the marking contact for approximately three seconds, Timer Tube V1 will fire.

- e. Timer Tube V1 operating;
- (1) supplies current to relay MMC unlatch winding causing MMC to release.
- f. Relay MMC releasing;
- (1) at make contacts 8R - 10R removes lock-up circuit,
 - (2) at break contacts 9R - 10R restores positive 120 volt path to Thyatron S-54, preparing it for a new operating cycle.
 - (3) at make contacts 9L - 10L interrupts the start control circuit of transmitter distributor LAXD1.
 - (4) at make contacts 7L - 8L removes the circuit path to meteorological connection lamp L3.
- g. Circuit is now restored to normal, ready for a new cycle.
16. CORRECTIONS TO DRAWINGS. Western Union Wiring Schematic #195496-32 to be corrected lightly in red pencil to show circuit changes.
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.
18. CORRECTIONS TO RECORDED DATA. None.



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**CHAPTER 56. FASS (FULLY AUTOMATIC SWITCHING SYSTEM) - PLAN 59 (3)
TEST TABLE, W. U. TYPE 9982-A**

1. **OBJECT.** To add a "clear out" function that will reset the flip-flops in the Intercept Receiving Circuit Modules (IR1 & IR2) when tested in W. U. Type 9982-A Test Table. The stencilling of Switches S97-S101 will now agree with modified Intercept Circuit operation.
2. **REASON FOR MODIFICATION.** The original circuit design did not provide for clearing and resetting flip-flops in the IR1 & IR2 modules. After this modification stencilling of switches S97-S101 on mounting plate of Test Table will now agree with modified Intercept Circuit operation.
3. **APPLICATION.** This modification shall be made only to FASS Plan 59 Test Table, W. U. Type 9982-A, installed at Honolulu IFSS/ATCC facility. (Balboa equipment modified prior to shipment)
4. **REFERENCES.**
 - a. W. U. Specification No. 13004-A, (original), issued 7/15/60 and Appendix No. 1, issued 10/25/61, for Test Table assembly and wiring use drawing #193869 for wiring modification.
 - b. W. U. Specification No. 13263-A, (original), issued July 3, 1961, for Test Table Theory of Operation, paragraphs 109-115.
5. **MATERIALS REQUIRED.** Three (3) feet of #22 AWG, stranded, black, polyethylene insulation or equal wire.
6. **SOURCE OF MATERIAL.** Station stock or local purchase.
7. **TOOLS OR TEST EQUIPMENT REQUIRED.** Standard station miscellaneous hand tools.
8. **WORK TO BE PERFORMED BY.** As programmed by the Region.
9. **WHEN MODIFICATION IS TO BE PERFORMED.** As scheduled by the Region.
10. **ESTIMATED TIME REQUIRED.** Four (4) man-hours per FASS Plan 59 Facility.
11. **DISPOSITION OF SURPLUS PARTS.** None.

12. MODIFICATION PROCEDURE. Use Western Union original specification #13004-A, issued 7/15/60, for test table and locate wiring drawing #193869-28. Check wiring on S97, S98 through S101 and S106 to ascertain that switch modules is wired according to original print, if so, perform the following.

- a. On switch S97, interchange leads on switch terminals 1 and 3.
- b. Report step (a) on switches S98 through S101.
- c. Remove lead connecting switch terminals S105-3 to S106-3.
- d. Add a new lead connecting switch terminals S105-3 to S106-6.
- e. Add a new lead connecting switch terminals S105-6 to S106-3.

Note: After modification test table switch module wiring should now conform to W. U. wiring drawing 193869-28, part of W. U. specification 13004-A, Appendix No. 1, issued 10/25/61.

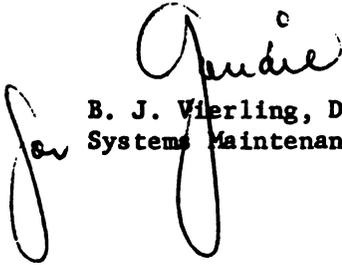
13. TEST AFTER MODIFICATION.

- a. Make a visual inspection of the modification to determine general appearance and workmanship.
- b. Install Intercept Receiving Circuit Module, W. U. Type 9809-A, in test table and conduct operational test, determine that operation of switches S97 through S101 and stencilling of switches on mounting plate now agree with test procedures, (see W. U Specification #13263-A, paragraphs 109-115), for clearing flip-flops in the IR1 circuit board.

14. USE. At Honolulu IFSS/ATCC Plan 59 facility.

15. RESULTS OF MODIFICATION. Switch positions S97-S101 operation and stencilled labels on switch mounting plate will now agree with test procedures for the Intercept Receiving Circuit Module, using Test Table W. U. Type 9982-A and W. U. Specification #13263-A. The flip-flop circuits will now clear out and reset for the next test operation.

16. CORRECTIONS TO DRAWINGS. Applicable Western Union Drawings shall be corrected to show the wiring changes.
17. CORRECTIONS TO INSTRUCTIONS. None.
18. CORRECTIONS TO RECORDED DATA. None.


B. J. Vierling, Director
Systems Maintenance Service

CHAPTER 57. MODIFICATION - APULS TONE COUPLER
SYMBOL Q401

TYPE CA-5032 (8)

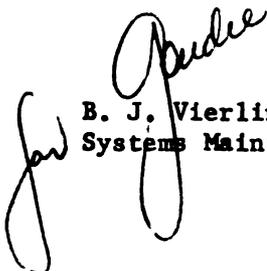
1. OBJECT. To improve reliability of Tone Coupler Transistor stage Q401, type 2N519A, by stabilizing the bias current under varied operating temperatures.
2. REASON FOR MODIFICATION.
 - a. To eliminate marginal operation of Tone Coupler Q401.
 - b. To allow replacement of transistor 2N519A from stock rather than on a selection basis.
3. APPLICATION. This modification shall be accomplished on all APULS type CA-5032 equipment.
4. REFERENCES.
 - a. APULS CA-5032 (serial numbers 1-126) Instruction Book per contract Cca-33957, dated June 25, 1958.
 - b. Line Interlock Schematic, Fig. 45.
 - c. APULS, Over-All Schematic, Fig. 39.
5. MATERIAL REQUIRED. One (1) resistor (fixed, composition), $\frac{1}{2}$ watt 100K ohms \pm 5%.
6. SOURCE OF MATERIAL. Station stock or local purchase.
7. TOOLS OR TEST EQUIPMENT REQUIRED. Standard station miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. As programmed by the Regions.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the Regions.
10. ESTIMATED TIME REQUIRED. Two (2) man-hours per APULS unit.
11. DISPOSITION OF SURPLUS PARTS. None.

12. MODIFICATION PROCEDURES.

- a. Using spare Line Interlock Subassembly 2 (400-599), add a 100K $\frac{1}{2}$ watt resistor from terminal #6 of transformer T401 to base of 2N519A transistor Q401.
- b. Install modified Line Interlock Subassembly 2 (400-599) in spare APULS unit and conduct operational test.

13. TEST AFTER MODIFICATION.

- a. Make a visual inspection of the subassembly to determine general appearance and workmanship.

14. USE. To all APULS Type CA-5032 units.15. RESULTS OF MODIFICATION. Tone Coupler Q401 will be more responsive to line conditions and will oscillate under a wider tolerance of operating temperatures within the APULS unit.16. CORRECTIONS TO DRAWINGS. Instruction Book for APULS Type CA-5032 Line Interlock, Fig. 39 and APULS Over-all Schematic, Fig. 45 shall be corrected to show circuit change.17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.18. CORRECTIONS TO RECORDED DATA. None.19. IMPLEMENTATION. Upon receipt of this chapter.

B. J. Vierling, Director
Systems Maintenance Service

CHAPTER 59. MODIFICATION - ADIS (22)
MESSAGE DIRECTOR - AC-282 AND AC-286

1. **OBJECT.** To wire in twenty-five (25) additional station identifiers in ADIS Message Directors at all ADIS I/C and S/R stations.
2. **REASON FOR MODIFICATION.** AT-200 has requested that 25 additional station identifiers be made available.
3. **APPLICATION.** This modification shall be made to address selector drawers located in Cabinets AC-282 and AC-286 at all ADIS I/C and S/R stations.
4. **REFERENCES.**
 - a. Teletype Corporation Bulletin 268B, Volume No. 1, pages 2-72 through 2-78.
 - b. Teletype Corporation Wiring Diagram 5102WD for ADIS I/C stations.
 - c. Teletype Corporation Wiring Diagram 5103WD for ADIS S/R stations.
 - d. Teletype Corporation Wiring Diagram 5144WD for Core Board Assembly of both I/C and S/R stations.
 - e. Core Board Assembly wiring chart for Board No. 171386(G), supplied as part of this modification instruction.
 - f. Modification AF P 6620.1, Chapter 47 (formerly EEM No. 832 of 3/22/62).
5. **MATERIALS REQUIRED.**
 - a. The wire required to insert additional station identifiers has already been furnished by the equipment manufacturer. This material was placed in a paper bag in the storage drawer of each Message Director. The following wiring material sets, part numbers as indicated, sufficient to wire in 125 cores were supplied originally. Fifty sets were employed as referenced in Paragraph 4.6 above. Refer to 5102WD for I/C station and 5103WD for S/R station core board and receptacle identification.

- b. Wire Set (125 each), Part No. 171411 - tinned on both ends; to be used as the output winding of the cores.
- c. Wire Set (125 each), Part No. 171459 - 3 feet long; tinned on one end only; to be used to program the three lower core boards (F,G,H) on the left side of the unwired drawer. (42 wires for each core board)
- d. Wire Set (42 each), Part No. 171460 - 5 feet, 6 inches long; tinned one end only; to be used to program cores on core board "P" and terminate on core board "H".
- e. Wire Set (42 each), Part No. 171808 - 3 feet, 6 inches long; tinned on one end only; to be used on core board "E" and terminated on receptacle "K". (Not used this modification.)
- f. Resistors, 1 ohm, one-half watt; required to build up the one and one-half ohm resistor network.

6. SOURCE OF MATERIALS.

- a. Resistors, station stock or local purchase. (Teletype Corporation Part No. 171589 or equal)
- b. Core Board wiring sets supplied by manufacturer of equipment.

7. TOOLS OR TEST EQUIPMENT REQUIRED.

- a. Standard station teletypewriter tool kit.
- b. Wiring Jig, Teletype Corporation Part No. EJM-4973.

8. WORK TO BE PERFORMED BY. Personnel as directed by the cognizant Regional Office.

9. WHEN MODIFICATION IS TO BE PERFORMED. Requested by July 30, 1963.

10. ESTIMATED TIME REQUIRED. Seventy-five (75) man-hours per ADIS I/C and S/R stations.

11. DISPOSITION OF SURPLUS PARTS. None.

12. MODIFICATION PROCEDURE.

- a. General. The block of 25 station identifiers shall be wired in Core Board "G", Part No. 171386. (Wiring Diagram 5102WD for ADIS I/C stations and Wiring Diagram 5103WD for S/R stations.) This modification is being written on the assumption that Core Board No. 171386(G) can be wired without removing the core board from the drawer. This method is preferred, since removal of the core board from the drawer will require additional work. IMPORTANT: If the preferred method is not feasible, the removal of the core board from the drawer will require removing the 40 inhibit wires, labeling them, and resoldering them later. Care must be used in handling the cores and associated wiring, as it is a #28 AWG with a special plastic insulating coating.
- b. Details.
- (1) Removal of the first Message Director drawer (left side, facing front of apparatus cabinet:
 - (2) Remove three plugs on rear of drawer.
 - (3) Remove the five countersunk screws on top (front to back) of the drawer. NOTE: Two screws will have to be removed through hole provided for this purpose in the sliding track.
 - (4) Remove four screws on bottom right side (left to right) of the drawer where the sliding track is located. NOTE: Two screws will have to be removed through the hole provided for this purpose in the sliding track.
 - (5) The drawer can now be removed from the cabinet and placed on a workbench or table. Care should be used in handling.
- c. Preliminary. Remove rear identification strip on both the right and left hand sides of the drawer by removing the five screws holding each strip. NOTE: Each screw holds a spacer under the identification strip. Care should be taken to find these spacers since they may fall into the drawer when each screw is removed.

d. Remove core-terminal boards and associated wiring.

- (1) Locate core-terminal board No. 171386(G) and unsolder insulated wires from terminals 41 and 42 and mark. Remove jumper wire connecting terminals 1 through 40 on board No. 171386(G).
- (2) Locate core-terminal board No. 171385(F), the board above 171386(G) and unsolder the two wires on terminals 41 and 42 that come from the lower board No. 171386(G). Mark them to be returned to same terminals for resoldering later.
- (3) Locate core terminal board No. 171384(E) and unsolder the wires from terminals 41 and 42 that come from the lower board No. 171385(F). Mark them for return to same terminals for resoldering later.
- (4) Remove core terminal board No. 171386(G) and No. 171385(F) by removing the two screws holding each board.

e. Wiring Cores.

- (1) Place drawer on large table with left side up so that core terminal board No. 171386(G) is accessible.
 - (2) Remove cores from board (G) by cutting and removing retaining twine. NOTE: Do not remove the cores from the read-out wires passing through the cores.
 - (3) Place core terminal boards and cores in Wiring Jig, Teletype Part No. EJM-4973, by placing jig in line with core terminal board No. 171386(G). Drawer should be on the right side of the jig.
 - (4) Program the cores of board No. 171386(G), using the wire 171459 provided.
 - (5) Place wired cores back on board 171386(G) as instructed and lace. Note that lacing will require moving core board 171386(G) from its mounting temporarily so that twine can be threaded through appropriate holes (see drawing 5144WB). Align cores on boards and lace using drawings 5102WD and 5144WD as an example.
- f. Replace cord board No. 171385(F) and No. 171386(G) on drawer and secure with appropriate screws.

- (1) Resolder wires previously removed from core board No. 171386(G), terminals 41 and 42.
 - (2) Resolder the two wires previously removed from core board No. 171386(G), terminals 41 and 42.
 - (3) Resolder the two wires previously removed from core board No. 171384, terminals 41 and 42.
 - (4) Solder a 1 ohm resistor to 41 and 42 of core board No. 171385(F), remove resistor between 41 and 42 of core board No. 171386(G).
 - (5) Resolder the two insulated wires to terminals 1 and 2 of core board No. 171385(F).
- g. Replace drawer on the drawer rack slide in the cabinet, using appropriate hardware. NOTE: At this time, do not replace the identifier strips removed in step 12.c(1) above.
- h. Open drawer as follows:
- (1) Remove the 5 screws (top to bottom) on the blank identifier strip on front right side of drawer. Remove strip.
 - (2) Remove the 5 screws (top to bottom) on right side of drawer front plate (where "pullout" handle is located).
 - (3) Remove the one screw on bottom of drawer at front end.
 - (4) Remove "clip-in" identifier strips (left to right) on right side of drawer.
 - (5) Remove following screws from right side of drawer.
 - (a) Four roundhead screws across top right side of drawer (left to right).
 - (b) Four hexhead screws across bottom right side of drawer.
 - (c) The screws under the "clipin" identifier strips removed in step 12. h(4).
 - (6) Right side of drawer should now swing open. See Drawing 5102WD.

1. Wiring output windings of cores wired in step 12.3.

- (1) Use the 171411 wires provided. (These wires are tinned on both ends.) Each core will require two turns of this wire. NOTE: Only one core should be wired and soldered at a time in order to prevent possible confusion.
- (2) Thread the output windings around each core. (2 turns) Important: The output winding direction determines the output pulse polarity to the diodes. Terminate the solder as shown.

13. TEST AFTER MODIFICATION.

- a. Make a visual inspection of the work to determine general appearance and workmanship.
- b. Replace all plugs in back of drawer and make up a "Test Tape" with the twenty-five (25) newly wired station identifiers. Place Message Director on the local test circuit with associated spare equipment and conduct test for callin in station identifiers.
- c. If the tests are successful, return drawer to its normal state. NOTE: To replace the spacers, removed in step 12. c. (1), it may be helpful to use glue to hold them in place.

14. USE. At all ADIS I/C and S/R stations.**15. RESULT OF MODIFICATION. Twenty-five (25) additional station identifiers of two, three, or four alphabetic or numerical sequences are now available for detection and recognition of Service A traffic diversion.****16. CORRECTIONS TO DRAWINGS.**

- a. Correct in red pencil, Teletype Corporation Actual Wiring Diagram 5102WD for ADIS I/C station, cabinet AC-282.
- b. Correct in red pencil, Teletype Corporation Actual Wiring Diagram 5152WD for ADIS S/R station, cabinet AC-286.

17. CORRECTIONS TO INSTRUCTIONS.

- a. Correct associated instructional material as appropriate and/or desirable.

- b. The standard system printed drawings will be updated by the equipment manufacturer as soon as a contract can be arranged. Subsequent distribution of the updated, newly printed drawings will be according to the initial drawing distribution of official record.

18. CORRECTIONS TO RECORDED DATA. None.

19. COORDINATION. This modification has been coordinated with AT-200, IM-140 and the IC stations.

20. IMPLEMENTATION.

- a. Upon receipt of this modification on installed equipment.
- b. Notify ADIS Primary Control Station MKC when this modification has been accomplished at the I/C and S/R stations.



B. J. Vierling, Director
Systems Maintenance Service

Enclosure:
Core Board Chart,
No. 171386(G)

CHAPTER 60. MODIFICATION - ADIS EQUIPMENT (24)
MESSAGE DIRECTOR - AC-282 AND AC-286 CABINETS
I/C AND S/R STATIONS

1. OBJECT. To wire fifty (50) additional station identifiers in ADIS Message Directors, at all ADIS I/C and S/R stations.
2. REASON FOR MODIFICATION. AT-300 has requested that 50 additional station identifiers be made available.
3. APPLICATION. This modification shall be made to address selector drawers, located in cabinets AC-282 and AC-286, at all ADIS I/C and S/R stations.
4. REFERENCES.
 - a. Teletype Corporation Bulletin 268B, Volume No. 1, pages 2-72 through 2-78.
 - b. Teletype Corporation Wiring Diagram 5102WD for ADIS I/C stations.
 - c. Teletype Corporation Wiring Diagram 5103WD for ADIS S/R stations.
 - d. Teletype Corporation Wiring Diagram 5144WD for Core Board Assembly of both I/C and S/R stations.
 - e. Core Board Assembly wiring chart for Board No. 171384(E) and Board No. 171385(F), supplied as part of this modification instruction.
 - f. Modification AF P 6620.1, Chapter 47. (Formerly EEM No. 832 dated 3/22/62.)
 - g. Modification AF P 6620.1, Chapter 59, Change 13.
5. MATERIALS REQUIRED.
 - a. The wire required to insert additional station identifiers has already been furnished by the equipment manufacturer. This material was placed in a paper bag in the storage drawer of each Message Director. The following wiring material sets, part numbers as indicated, sufficient to wire in 125 cores were supplied originally. Fifty sets were employed as referenced in paragraph 4f above. Refer to 51102WD for I/C station and 5103WD for S/R station core board and receptacle identification.

- b. Wire set (125 each) part No. 171411 - tinned on both ends, to be used as the output winding of the cores.
- c. Wire set (125 each) part No. 171459 - 3 feet long, tinned on one end only, to be used to program the three lower core boards (F,G,H) on the left side of the unwired drawer. (42 wires for each core board)
- d. Wire set (42 each) part No. 171460 - 5 feet, 6 inches long, tinned one end only, to be used to program cores on core board "P" and terminate on core board "H."
- e. Wire set (42 each) part No. 171808 - 3 feet, 6 inches long, tinned on one end only, to be used on core board "E" and terminated on receptacle "K." (Not used in this modification.)
- f. Resistors, 1 ohm, one-half watt, required to build up the one and one-half ohm resistor network.

6. SOURCE OF MATERIALS.

- a. Resistors, station stock or local purchase. (Teletype Corporation part No. 171589 or equal.)
- b. Core board wiring sets supplied by the manufacturer of equipment.

7. TOOLS OR TEST EQUIPMENT REQUIRED.

- a. Standard station teletypewriter tool kit.
- b. Wiring jig, Teletype Corporation part No. EJM-4973.

8. WORK TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.

9. WHEN MODIFICATION IS TO BE PERFORMED. Requested by September 30, 1964.

10. ESTIMATED TIME REQUIRED. One hundred and twenty-five (125) man-hours per ADIS I/C and S/R station.

11. DISPOSITION OF SURPLUS PARTS. None.

12. MODIFICATION PROCEDURE.

a. General.

- (1) The block of 50 station identifiers shall be wired as indicated in wiring charts per para. 4.e above. (Wiring diagram 5102WD for ADIS I/C stations and wiring diagram 5103WD for S/R station)

b. Details.

- (1) Removal of the first Message Director drawer. (left side, facing front of apparatus cabinet)
- (2) Remove three plugs on rear of drawer.
- (3) Remove the five countersunk screws on top (front to back) of the drawer. Note: Two screws will have to be removed through hole provided for this purpose in the sliding track.
- (4) Remove four screws on bottom right side (left to right) of the drawer where the sliding track is located. Note: Two screws will have to be removed through the hole provided for this purpose in the sliding track.
- (5) The drawer can now be removed from the cabinet and placed on a workbench or table. Care should be used in handling.

c. Preliminary.

- (1) Remove rear identification strip on both the right and left hand sides of the drawer by removing the five screws holding each strip. Note: Each screw holds a spacer under the identification strip. Care should be taken to find these spacers since, they may fall into the drawer when each screw is removed.

d. Remove core-terminal boards and associated wiring.

- (1) Locate core-terminal boards No. 171384(E) and 171385(F) and unsolder insulated wires from terminals 41 and 42 on each and mark. Remove jumper wire connecting terminals 1 through 40 on boards.
- (2) Locate core-terminal board No. 171384(E), the board above 171885(G) and unsolder the two wires on terminals 41 and 42 that come from the lower board. Mark them to be returned to same terminals for resoldering later.

- (3) Locate core terminal board No. 171385(F) and unsolder the wires from terminals 41 and 42 that come from the lower board. Mark them for return to same terminals for resoldering later.
- (4) Remove core terminal board No. 171384(E) and No. 171385(F) by removing the two screws holding each board.

e. Wiring Cores.

- (1) Place drawer on large table with left side up so that core terminal board is accessible.
- (2) Remove cores from board by cutting and removing retaining twine. Note: Do not remove the cores from the read-out wires passing through the cores.
- (3) Place core terminal boards and cores in wiring jig, Teletype Part No. EJM-4973, by placing jig in line with core terminal board. Drawer should be on the right side of the jig.
- (4) Program the cores of board using the wire 171459 provided.
- (5) Place wired cores back on board and lace. Note that lacing will require moving core board from its mounting temporarily so that twine can be threaded through appropriate holes. (See drawing 5144WB) Align cores on boards and lace using drawings 5102WD and 5144WD as an example.

f. Replace core board No. 171384(E) and No. 171385(F) on drawer and secure with appropriate screws.

- (1) Resolder wires previously removed from core board 171384(E) terminals 41 and 42.
- (2) Resolder the two wires previously removed from core board 171385(F), terminals 41 and 42.
- (3) Remove resistor between 41 and 42 of preceding core board.

g. Replace drawer on the drawer rack slide in the cabinet, using appropriate hardware. Note: At this time, do not replace the identifier strips removed in step 12c(1) above.

h. Open drawer as follows:

- (1) Remove the five (5) screws (top to bottom) on the blank identifier strip on front right side of drawer. Remove strip.
- (2) Remove the five (5) screws (top to bottom) on right side of drawer front plate. (where "pullout" handle is located)
- (3) Remove the one screw on bottom of drawer at front end.
- (4) Remove "clip-in" identifier strips (left to right) on right side of drawer.
- (5) Remove following screws from right side of drawer.
 - (a) Four roundhead screws across top right side of drawer. (left to right)
 - (b) Four hexhead screws across bottom right side of drawer.
 - (c) The screws under the "clip-in" identifier strips removed in step 12.h(4).
- (6) Right side of drawer should now swing open. (See Drawing 5102WD)

i. Wiring output windings of cores wired in step 12a(1).

- (1) Use the 171411 wires provided. (These wires are tinned on both ends.) Each core will require two turns of this wire.
Note: Only one core should be wired and soldered at a time in order to prevent possible confusion.
- (2) Thread the output windings around each core. (2 turns)
Important: The output winding direction determines the output pulse polarity to the diodes. Terminate and solder as shown.

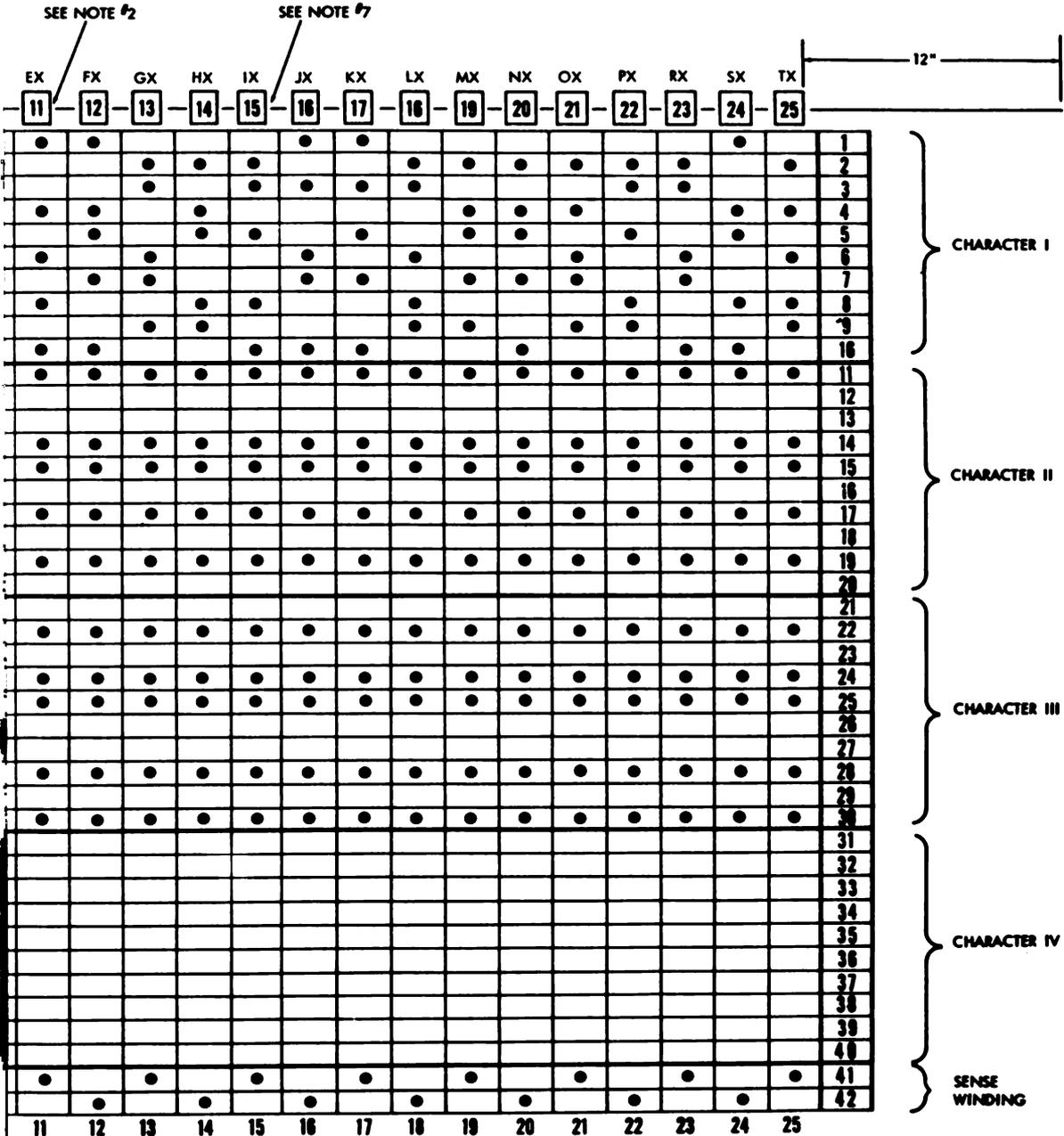
13. TEST AFTER MODIFICATION.

- a. Make a visual inspection of the work to determine general appearance and workmanship.
- b. Replace all plugs in back of drawer and make up a "Test Tape" with the fifty (50) newly wired station identifiers. Place Message Director on the local test circuit with associated spare equipment and conduct test for calling in station identifiers.

- c. If the tests are successful, return drawer to its normal state.
Note: To replace the spacers, removed in step 12.c(1), it may be helpful to use glue to hold them in place.
14. USE. At all ADIS I/C and S/R stations.
15. RESULT OF MODIFICATION. Fifty (50) additional station identifiers of two, three, or four alphabetic or numerical sequence are now available for detection and recognition of Service A traffic diversion.
16. CORRECTIONS TO DRAWINGS.
- a. Correct in red pencil, Teletype Corporation Actual Wiring diagram 5102WD for ADIS I/C station, cabinet AC-282.
- b. Correct in red pencil, Teletype Corporation Actual Wiring Diagram 5152WD for ADIS S/R station, cabinet AC-286.
17. CORRECTIONS TO INSTRUCTIONS.
- a. Correct associated instructional material as appropriate and/or desirable.
- b. The standard system printed drawings will be updated by the equipment manufacturer as soon as a contract can be arranged. Subsequent distribution of the updated, newly printed drawings will be according to the initial drawing distribution of official record.
18. CORRECTIONS TO RECORDED DATA. None.
19. IMPLEMENTATION.
- a. Upon receipt of this modification on installed equipment.
- b. Notify ADIS Primary Control Station MKC when this modification has been accomplished at the I/C and S/R stations.

for *Jaudie*
B. J. Vierling, Director
Systems Maintenance Service

Attachments: 2
Core Board No. 171385(F)
5145WD, Sheet 1.
Core Board No. 171384(E)
5144WD, Sheet 2.



NOTE:

1. " • " DENOTES WIRE GOES THROUGH CORE.
2. WIRE USED - RM 30648.
3. USE LACING TWINE RM 78008.
4. TELETYPE NUMBER 171646 CORES.
5. TELETYPE NUMBER 137471 TERMINAL.
6. PLATE, CORE MTE (RIGHT) 171407.
7. WIRE PATH WHEN MAKING CABLE.
8. ACTUAL POSITION OF CABLE WITH CORES.
9. CORE OUTPUT WINDINGS ARE NOT SHOWN.
10. MARK ODD, SPACE EVEN.

AF P 6620.1 CH. 14 CHAP. 60
(AT-200 11/26/63, 1/8/64)
ADIS (24)
CORE BOARD NO. 171385 (F)
5145WD.
SHEET 1

71381 CORE BOARD ASSEMBLY

137471 (45 PLS.)
SEE NOTE #5

- c. If the tests are successful, return drawer to its normal state.
Note: To replace the spacers, removed in step 12.c(1), it may be helpful to use glue to hold them in place.

14. USE. At all ADIS I/C and S/R stations.

15. RESULT OF MODIFICATION. Fifty (50) additional station identifiers of two, three, or four alphabetic or numerical sequence are now available for detection and recognition of Service A traffic diversion.

16. CORRECTIONS TO DRAWINGS.

a. Correct in red pencil, Teletype Corporation Actual Wiring diagram 5102WD for ADIS I/C station, cabinet AC-282.

b. Correct in red pencil, Teletype Corporation Actual Wiring Diagram 5152WD for ADIS S/R station, cabinet AC-286.

17. CORRECTIONS TO INSTRUCTIONS.

a. Correct associated instructional material as appropriate and/or desirable.

b. The standard system printed drawings will be updated by the equipment manufacturer as soon as a contract can be arranged. Subsequent distribution of the updated, newly printed drawings will be according to the initial drawing distribution of official record.

18. CORRECTIONS TO RECORDED DATA. None.

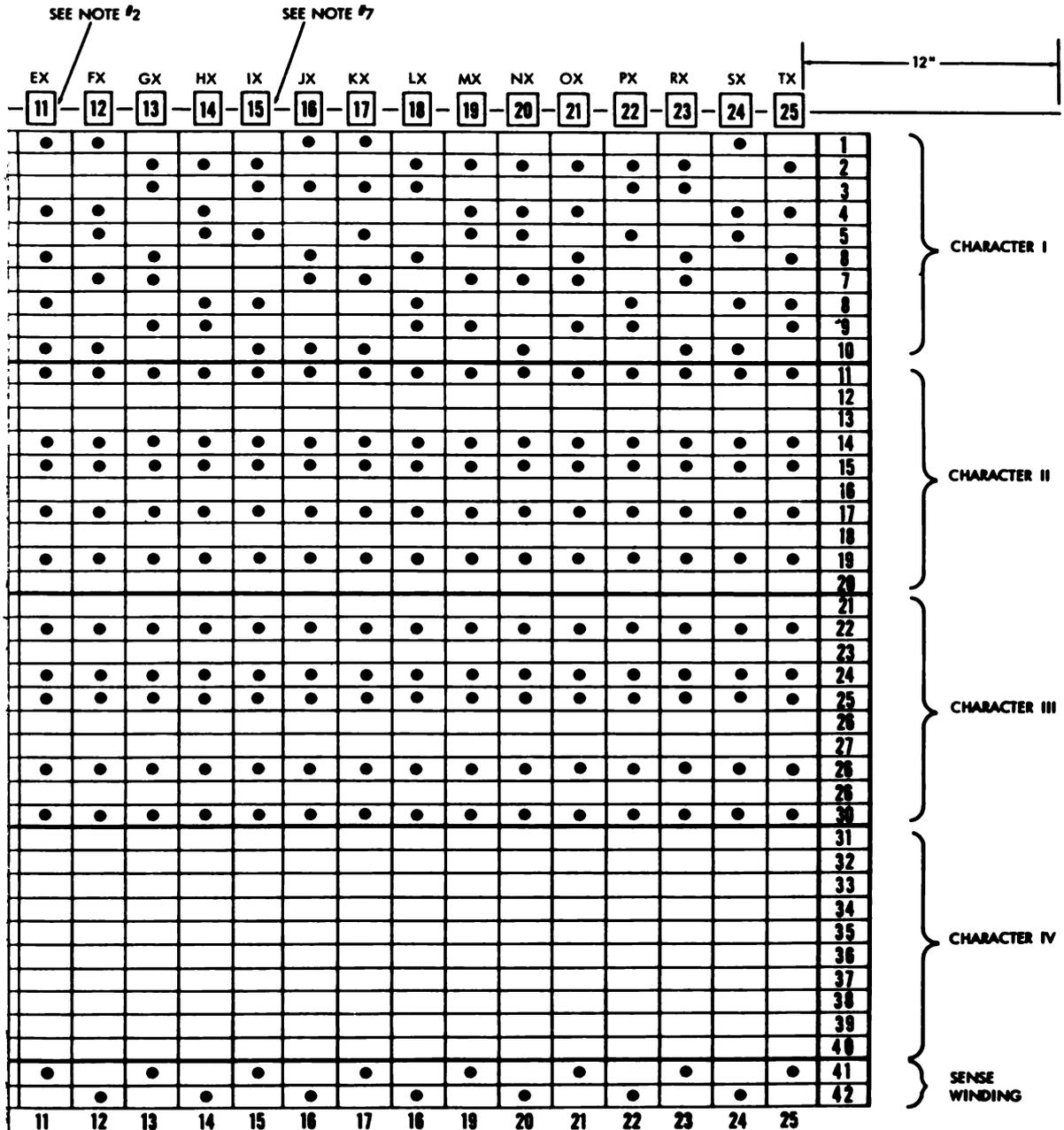
19. IMPLEMENTATION.

a. Upon receipt of this modification on installed equipment.

b. Notify ADIS Primary Control Station MKC when this modification has been accomplished at the I/C and S/R stations.

for 
B. J. Vierling, Director
Systems Maintenance Service

Attachments: 2
Core Board No. 171385(F)
5145WD, Sheet 1.
Core Board No. 171384(E)
5144WD, Sheet 2.



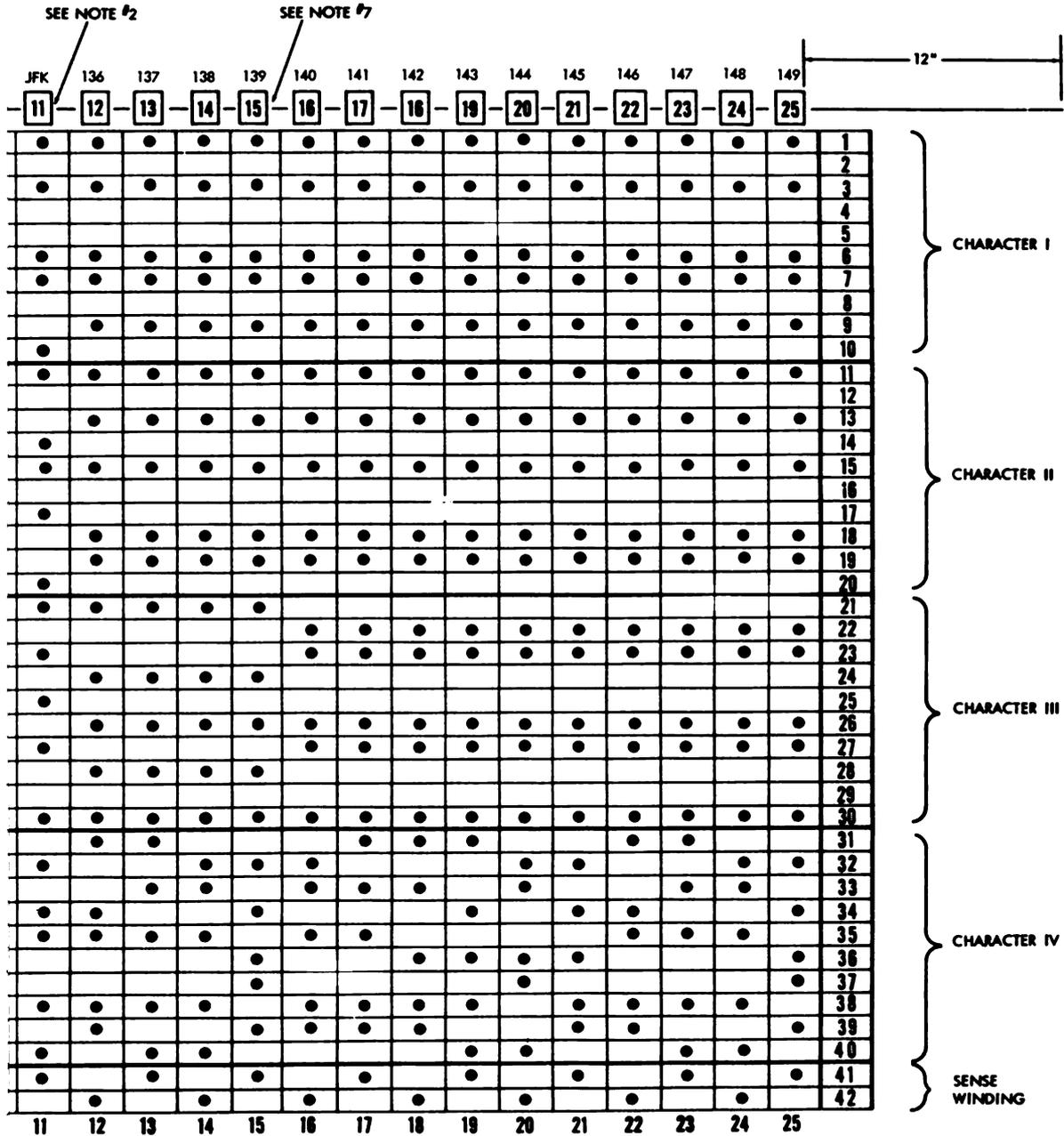
NOTE:

1. " • " DENOTES WIRE GOES THROUGH CORE.
2. WIRE USED - RM 30648.
3. USE LACING TWINE RM 78808.
4. TELETYPE NUMBER 171646 CORES.
5. TELETYPE NUMBER 137471 TERMINAL.
6. PLATE, CORE MTE (RIGHT) 171407.
7. WIRE PATH WHEN MAKING CABLE.
8. ACTUAL POSITION OF CABLE WITH CORES.
9. CORE OUTPUT WINDINGS ARE NOT SHOWN.
10. MARK ODD, SPACE EVEN.

AF P 6620.1 CH. 14 CHAP. 60
(AT-200 11/26/63, 1/8/64)
ADIS (24)
CORE BOARD NO. 171385 (F)
5145WD.
SHEET 1

71381 CORE BOARD ASSEMBLY

137471 (45 PLS.)
SEE NOTE #5



NOTE:

1. " • " DENOTES WIRE GOES THROUGH CORE.
2. WIRE USED - RM 30648.
3. USE LACING TWINE RM 78008.
4. TELETYPE NUMBER 171646 CORES.
5. TELETYPE NUMBER 137471 TERMINAL.
6. PLATE, CORE MTE (RIGHT) 171407.
7. WIRE PATH WHEN MAKING CABLE.
8. ACTUAL POSITION OF CABLE WITH CORES.
9. CORE OUTPUT WINDINGS ARE NOT SHOWN.
10. MARK ODD, SPACE EVEN.

AF P 6620.1 CH.14 CHAP.60
(AT-200 11/26/63, 1/8/64)
ADIS (24)
CORE BOARD NO. 171384 (E)
5144 WD.
SHEET 2.

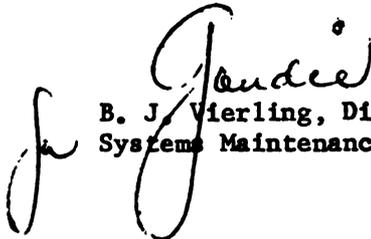
71381 CORE BOARD ASSEMBLY

137471 (45 PLS.)
SEE NOTE #5

CHAPTER 61. FASS (FULLY AUTOMATIC SWITCHING SYSTEM)
PLAN 59(5) ELECTRONIC TRANSMITTER MODULE
WESTERN UNION TYPE 9757-A

1. OBJECT. This chapter amends Western Union Telegraph Company Change Order No. 4110, issued April 18, 1961, as appendix No. 2 to Specification No. 12392-B. The Change Order No. 4110 is amended by replacing the minus twenty (20) volts on the collector resistor of transistor stage T7.
2. REASON FOR MODIFICATION. Field use of FASS Plan 59 equipment has disclosed the requirement for operating transistor stage T7 binary in the "Count Two Character", made for increased reliability and efficiency in the operation of the FASS equipment.
3. APPLICATION. This modification shall be made to the FASS equipment installed at Honolulu IFSS/ATCC facility. (Balboa equipment modified prior to shipment)
4. REFERENCES.
 - a. Western Union Telegraph Company Specification No. 12392-B; Appendices 1, 2 and 3.
 - b. Western Union Drawing No. 235904.8 (part of specification No. 12392-B), for wiring of Electronic Transmitter Module, Western Union Type 9757-A.
 - c. Western Union Drawing No. 235220-7 (part of specification No. 12392-B), for theory of operation of Electronic Transmitter Module, Western Union Type 9757-A.
5. MATERIAL REQUIRED. One (1) foot of #22AWG, stranded, purple, polyethylene insulated or equal.
6. SOURCE OF MATERIAL. Station stock or local purchase.
7. TOOLS OR TEST EQUIPMENT REQUIRED. Standard station miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. As programed by the Region.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the Region.
10. ESTIMATED TIME REQUIRED. Two (2) man-hours per FASS installation.

11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE. Use Western Union Telegraph Company Specification No. 12392-B, Appendix No. 2, Drawing No. 235904-8, issued April 18, 1961 and perform the following steps:
 - a. Remove purple lead connecting terminal #29 and terminal #82 of module 9757-A (at terminal #29) and reconnect purple lead to terminal #87.
 - b. Add a new purple lead, connecting terminal #87 to terminal #29 of module 9757-A.
 - c. Leads to follow shortest route consistent with standard practice for surface wiring of semi-conductor circuit boards.
13. TEST AFTER MODIFICATION. Install Electronic Transmitter ET3.1 (Western Union Module 9757-A) in Test Table, Western Union Type 9982-A and perform tests. Binary Flip-Flop stage T7-T9 should now meet all operational requirements. (See Western Union Drawing No. 235220-7, ET3.1, Theory of Operation)
14. USE. At Honolulu IFSS/ATCC FASS Plan 59 installation.
15. RESULTS OF MODIFICATION. This wiring change restores minus twenty (20) volts to the collector resistor, of transistor T7 of the Binary Flip-Flop stage in the "Count Two Character" circuit of Electronic Transmitter ET3.1. (Western Union Module 9757-A) The module now conforms to wiring changes specified in Western Union Change Order No. 4161 and documented by Appendix No. 3, to Western Union Specification 12392-B, issued August 17, 1961.
16. CORRECTIONS TO DRAWINGS. Applicable Western Union Drawings shall be corrected to show wiring changes.
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.
18. CORRECTIONS TO RECORDED DATA. None.
19. IMPLEMENTATION. Upon receipt of this chapter.


B. J. Vierling, Director
Systems Maintenance Service

CHAPTER 62. FASS - PLAN 59(4) - DUPLEX WAY STATION SELECTOR -
WESTERN UNION TYPE 9782-A AND 9782-1-A AND
RELAY BANK - WESTERN UNION TYPE 9790-A

1. OBJECT. To improve circuit reliability between way station and FASS Center operation.
2. REASON FOR MODIFICATION. Original system design of way station and Center operation will allow the loss of a start-of-message selection code under certain relay operating sequences.
3. APPLICATION. This modification shall be made to Plan 59 FASS equipment located at Honolulu and Balboa IFSS/ATCC facilities.
4. REFERENCES.
 - a. Western Union Telegraph Company Specification No. 12491-A for Relay Bank 9790-A.
 - b. Western Union Telegraph Company Specification No. 11818-A for Duplex Way Selector 9782-A series.
5. MATERIAL REQUIRED.
 - a. Three (3) feet of #22 AWG, stranded, black, polyethylene or equal,
 - b. Resistor, 560 ohms \pm 10%, $\frac{1}{2}$ watt, Western Union Type 82-A or equal.
6. SOURCE OF MATERIAL. Station stock or local purchase.
7. TOOLS OR TEST EQUIPMENT REQUIRED. Standard station miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the Regions.
10. ESTIMATED TIME REQUIRED. Four (4) man-hours per FASS installation.
11. DISPOSITION OF SURPLUS PARTS. None.

12. MODIFICATION PROCEDURE.

- (1) Relay Bank, Western Union Type 9790-A. Using Western Union Specification No. 12491-A, issued 8/22/58, locate assembly and wiring drawing No. 237211-8 and perform the following steps:
 - a. Remove lead from terminal 8U of 24 point base jack connection strip (Western Union No. 16708), and reconnect to terminal 16L same connection strip.
 - b. Remove lead connecting relay TIR-8b spring contact with relay TSR-2b spring contact.
 - c. Remove lead connecting relay TSR-2b spring contact with relay TIR-2t spring contact.
 - d. Add a new lead connecting relay TIR-8b spring contact to relay TIR-2t spring contact.
 - e. Add a new lead connecting relay TSR-2b spring contact to terminal 8U of terminal strip Western Union No. 16708.
 - f. Remove lead connecting relay TSR-1b spring contact to terminal 1U of terminal strip Western Union No. 16708.
 - g. Add a new lead connecting relay TSR-1b spring contact to relay PRQ spring contact 3.
 - h. Connect 560 ohm resistor, symbol R1 to terminal #1 of terminal strip #1520 (same terminal where one side of capacitor C1 is connected) and relay ILO-2b spring contact.

- (2) Duplex Way Station Selector Units, W. U. Type 9782-A and 9782-1-A. Using Western Union Specification 11818-A, issued 11/5/58, locate Western Union wiring drawings numbers 188331-9 and 188332-7 and perform the following steps:
 - a. Remove lead connecting RB2-1U (terminal blocks RB2 shown on wiring drawing 188331-9 and terminal 26 of connecting strip TS. (Connecting strip TS shown on wiring drawing #188332-7))
 - b. Remove lead connecting terminal RB2-8U and one side of resistor BR29-1. (Wiring drawing #188331-9)
 - c. Add a lead from terminal RB2-16L to vacant terminal of resistor BR29-1. (Wiring drawing #188331-9)

13. TEST AFTER MODIFICATION.

- a. Make a visual inspection of modified components (Relay Bank 9790-A and Duplex Way Selector 9782-A) to determine general appearance and workmanship.
- b. Check operation of relays TSR and TIR, when TSR relay is held to the operating side, relay TIR should not be energized.

14. USE. At Honolulu and Balboa FASS installations.

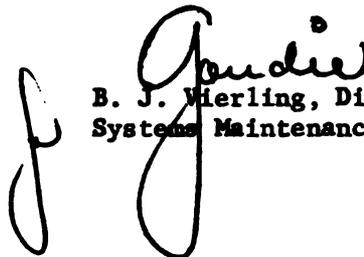
15. RESULTS OF MODIFICATION. Will eliminate the possibility of a loss of a start-of-message code selection in a transmission of a message from a Way Station to the Center by preventing the Transmitter Initiate Relay (TIR) from being energized in the same operating time as the Transmitter Start Relay (TSR).

16. CORRECTION TO DRAWINGS. Western Union Drawings #188331, #188332 and #237211 shall be corrected lightly in red pencil to reflect wiring changes.

17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.

18. CORRECTIONS TO RECORDED DATA. None

19. IMPLEMENTATION. Upon receipt of this chapter.


B. J. Vierling, Director
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CHAPTER 63. APULS UNIT CA-5032 (9)
SERVICE "B" SYSTEM

1. OBJECT. To eliminate "Area 'B'", APULS "check" transmissions.
2. REASON FOR MODIFICATION. Revised operational requirements.
3. APPLICATION. This modification shall be accomplished at all facilities having an APULS unit, CA-5032, on the Area "B" circuits, including stand-by or spare units.
4. REFERENCES.
 - a. Area "B" APULS Coding Charts.
 - b. Auto Schedule, Schematic, Figure 43, APULS Instruction Book.
5. MATERIALS REQUIRED. Two feet of hook-up wire.
6. SOURCE OF MATERIALS. Local stock.
7. TOOLS OR TEST EQUIPMENT REQUIRED. Miscellaneous small hand tools.
8. WORK TO BE PERFORMED BY. Maintenance personnel at facilities involved.
9. WHEN MODIFICATION IS TO BE PERFORMED. Concurrent with the commissioning of the Service "B" Data Interchange System (BDIS).
10. ESTIMATED TIME REQUIRED. Three hours per APULS unit.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE. Considering that all coding charts are not identical, the following instructions will not be detailed as to column numbers:
 - a. Reference APULS Coding Charts

Locate columns containing relay calls, originating station identifier and check message. These columns will contain eight characters and will be connected to "AS" in the bottom or AS-D row.
 - b. Remove the connections to the AS terminal in the AS-D row of each column and connect these terminals to the Delete "D" function.
 - c. Remove the SP connection in the AF row (Do not remove the ST from AF row).

- d. Reference Figure 43, Auto Schedule Schematic, APULS (CA-5032) Instruction Book

Remove the connection from terminal 31 of P 901 to wiper row 4 of K 901 and tape the ends.

Remove connection and tape ends from terminal 32 of P 901 to coil of K 901.

If K 901 is not in Home position 11, set to this position.

3. TESTS AFTER MODIFICATION.

- a. Place APULS unit and a monitor printer on a local test loop.
- b. The relay station calls, originating station identifications and the check message, should not be transmitted. The K and Q station calls appearing in their normal sequence. Other functions should be normal.

14. USE. At all facilities having an APULS on the Area "B" circuits.

15. RESULTS OF MODIFICATION. The check messages will not be transmitted.

16. CONNECTIONS TO DRAWINGS.

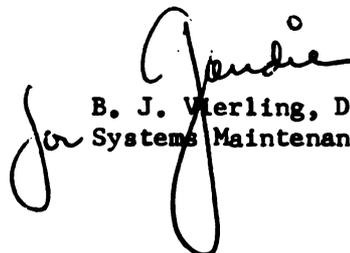
- a. Correct APULS Coding Charts.
- b. Correct Figure 43, APULS Instruction Book.

17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate and/or desirable.

18. CORRECTION TO RECORDED DATA. None. (Note that modification was made).

19. COORDINATION. This modification has been coordinated with IM-140 and AT-275.

This modification was requested by AT-200.


B. J. Vierling, Director
Systems Maintenance Service

CHAPTER 64. TELETYPEWRITER - PRINTING STUNT BOX -
BDIS CIRCUITS

1. OBJECT. To make provision for the copying of DEFCONS, GENOTS, etc., on all Area "B" circuit printers, by using the single two letter call "XX".
2. REASON FOR MODIFICATION. Revised operational requirements.
3. APPLICATION. This modification shall be accomplished at all facilities having teletypewriter printers on the Area "B" (BDIS) circuits and on all printers being used, including spare equipment.
4. REFERENCES.
 - a. Stunt box arrangement drawings.
 - b. Relay control group drawings.
5. MATERIALS REQUIRED.
 - a. Function Bar Spring, 2 ea., #4703.
 - b. Function Lever Springs, 2 ea., #90517.
 - c. Function Pawl Springs, 2 ea., #157240.
 - d. Function Pawl Springs Wick, 2 ea., #72522.
 - e. Function Bar, Stunt Case "X", 1 ea., #153432.
 - f. Function Bar "X", no restrictions, 1 ea., #152701, or Universal Function Bar, 1 ea., #153440.
 - g. Function Lever, 1 ea., #152121.
 - h. Function Lever, 1 ea., #152642.
 - i. Function Pawl, 2 ea., #152653.
 - j. Spring Plate, 1 ea., #154613.
 - k. Spring Plate, 1 ea., #152660.
 - l. *Switch, 1 ea., #172525.
 - m. Hook-up wire.

* May not be required, see paragraph 12.
6. SOURCE OF MATERIALS. Local stock if available and OMD.
7. TOOLS REQUIRED. Miscellaneous small hand tools.
8. WORK TO BE PERFORMED BY. Maintenance personnel at facilities involved.

9. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of material required and not later than October 10, 1963.
10. ESTIMATED TIME REQUIRED. Four man-hours per printer.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE. Considering that the printer stunt box arrangements are not necessarily identical at all facilities, the following instructions will not be detailed as to exact stunt box slots and terminals used:
- a. After removing the stunt box from the printer, locate two adjacent unused slots with an unused n.o. switch contact over the highest number of the two slots. (If a switch contact is not available, a switch part No. 172525 must be installed.)
- b. Install the following parts in the lowest numbered slot:

| | |
|----------------------------|--------|
| Function Bar, Stunt Cast X | 153432 |
| Function Bar Spring | 4703 |
| Function Lever | 152121 |
| Function Lever Spring | 90517 |
| Function Pawl | 152653 |
| Function Pawl Spring | 157240 |
| Wick, Function Pawl Spring | 72522 |
| Spring Plate (latch) | 154613 |

- c. In the adjacent higher numbered slot, install these parts:

| | |
|-----------------------------------|--------|
| *Function Bar X (no restrictions) | 152701 |
| Function Bar Spring | 4703 |
| Function Lever | 152642 |
| Function Lever Spring | 90517 |
| Function Pawl | 152653 |
| Function Pawl Spring | 157240 |
| Wick, Function Pawl Spring | 72522 |
| Spring Plate | 152660 |

- * If Universal Function Bar used, remove tines for unrestricted "X" configuration.

- d. If the highest numbered slot is not located in a position to actuate a n.o. contact arm of a switch assembly, already installed, procede as follows:

Mount switch (Part #172525) on the stunt box, so that one section may be actuated by the function lever in the highest numbered slot.

Remove contact arms from the switch sections not being used.

- e. Wire the make contacts of the above switch section in parallel with the nearest switch, used for electrically shifting to print case.

13. TESTS AFTER MODIFICATION.

- a. Prepare tape << ↓ X X ↓ ≡ Text ≡ < ↓ << ↓ X A ↓ ≡ Text ≡ < ↓
- b. Place printer and transmitter-distributor on test loop.
- c. Run above tape through transmitter-distributor.
- d. Note operation. The printer should shift to print case on first portion of the tape going back into printed suppression at first EOM. The printer should, on the last position of the tape, stay in stunt case.

14. USE. At all facilities having printers on the BDIS system circuits.

15. RESULTS OF MODIFICATION. All printers used on the BDIS circuits will be shifted to print case when receiving the call XX preceded by a condition code and shifted back to stunt case upon receiving the end of message code.

16. CORRECTIONS TO INSTRUCTIONS. Make corrections in red pencil to stunt box arrangement and relay control group drawings.

17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate and/or desirable.

18. CORRECTIONS TO RECORDED DATA. None.

19. COORDINATION. The modification has been coordinated with IM-140 and AT-275.

This modification was requested by AT-200.


B. J. Tierling, Director
Systems Maintenance Service

CHAPTER 65. MODIFICATION - FASS - PLAN 59(6)
DUAL SENDING CONTROL CABINET
WESTERN UNION TYPE 10085-A

1. OBJECT. To provide positive control of electrical code pulse data prior to circuit transmission.
2. REASON FOR MODIFICATION. To stop distributor whenever the transmitter is stopped via the LEXD start-stop switch.
3. APPLICATION. This modification shall be made to Plan 59 equipment installed at Honolulu and Balboa IFSS/ATCC facilities.
4. REFERENCES.
 - a. Western Union Telegraph Company Specification 12743-A-P.
 - b. Western Union Telegraph Company Specification 12751-A, Appendix No. 1.
 - c. Western Union Drawing No. 245965-2.
 - d. Western Union Drawing No. 245966-7.
 - e. Western Union Drawing No. 245967-7.
 - f. Western Union Drawing No. 245969-2.
 - g. Western Union Drawing No. 245970-9.
 - h. Western Union Drawing No. 235299-8.
5. MATERIAL REQUIRED.
 - a. Five feet (5) of #22 AWG, stranded, black, polyethylene insulation or equal.
 - b. One (1) resistor, composition, 1 watt, 390 ohms $\pm 10\%$, Western Union Type 83-A.
 - c. One (1) capacitor, tubular metalized paper, 400V; 0.5 Mfd. $\pm 20\%$, Western Union Type P82-922H.
 - d. Button 48182 Plug 13/32" hole size, steel, United Carr Fastener Co. or equal.

6. SOURCE OF MATERIAL. Station stock or local purchase.
7. TOOLS OR TEST EQUIPMENT REQUIRED. Standard station miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. When scheduled by the cognizant regional office authority.
10. ESTIMATED TIME REQUIRED. Eight (8) man-hours per FASS Plan 59 installation.
11. DISPOSITION OF SURPLUS PARTS. Place switch symbol SW-3, Western Union Part No. 643643 in local station stock.
12. MODIFICATION PROCEDURE.
 1. Using Western Union Specification No. 12743-A-P and Western Union Specification No. 12751-A, Appendix No. 1, perform the following steps.
 - a. Using Western Union Specification 12751-A, Appendix No. 1, and Drawing No. 235299-8 for Relay Bank No. 10126-A, remove wire going from spring contact No. 3 of relay CNE to terminal board U, terminal No. 1. This wire will be removed from TB-IU, terminal No. 1 and connected to spring contact No. 2 of relay TR. (Note: On DWG 235299, refer to top set of contacts on relay TR as T and bottom set as B.)
 - b. Connect spring contact TR-3B of relay TR to terminal board U, terminal No. 2U.
 - c. Connect spring contact TR-1B of relay TR to terminal board U, terminal No. 1U.
 2. Using Western Union Specification No. 12743-A, Drawing numbers 245967-7, 245965-2, 245966-7, 245969-2 and 245970-9, remove wire from the following connection terminals.
 - a. UDT2-9 and UDT2-20
 - b. UDT2-12 and UDT2-19.

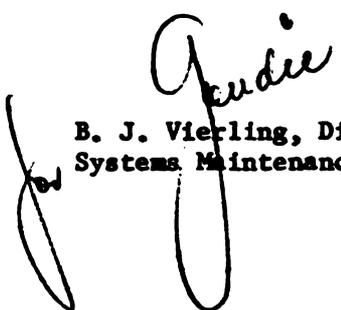
- c. UDT2-21 and SW3-A2
- d. UDT2-23 and UDT1-3
- e. UDT1-3 and UDT1-15
- f. UDT1-9 and SW3-B2
- g. LDT2-9 and LDT2-20
- h. LDT2-12 and LDT2-19
- i. LDT2-21 and SW3-A1
- j. LDT1-9 and SW3-B1
- k. SW3-B and PR-U
- l. SW3-A and RB-1U
- m. CB-1 and CB-3
- n. CB-3 and CB-44
- o. CB-4 and V4-2
- p. CB-4 and RB-20U
- q. CB-43 and RB-1U
- u. CB-9 and CB-11

3. Using the same Western Union Specification and Drawings listed under paragraph 12.2, add wires to the following connection terminals.

- a. CB-5 and UDT2-19
- b. CB-3 and CB-11
- c. CB-3 and CB-9
- d. CB-10 and V4-2
- e. CB-10 and RB-20U

- f. CB-1 and CB-24
 - g. CB-24 and CB-44
 - h. CB-43 and LDT2-19
 - i. UDT2-9 and UDT2-12
 - j. UDT2-19 and UDT2-21
 - k. UDT2-20 and RB-2U
 - l. UDT2-23 and UDT1-15
 - m. UDT1-3 and LDT1-9
 - n. UDT1-9 and PR-U
 - o. LDT2-9 and LDT2-12
 - p. LDT2-19 and LDT2-21
 - q. LDT2-20 and RB-1U
4. Using Western Union Component Board Assembly drawing 245966-7, perform the following steps.
- a. Remove 15K resistor between CB-3 and CB-4 and install between CB-10 and CB-24.
 - b. Install 0.5 Mf. capacitor between CB3 and CB4.
 - c. Install 390-ohm resistor between CB4 and CB5.
5. Use Western Union Drawing No. 245965-2 and remove Rotary Switch, Part No. 643643 from control panel and install Button Plug, Western Union Part No. 48182.
13. TEST AFTER MODIFICATION.
- a. Place Dual Sending Control Cabinet No. 10085-A in a local test circuit and load the upper and lower LEXD transmitters with a test message tape.
 - b. Stop and start LEXD via the switch, noting that the distributor will stop at the same time the transmitter is stopped.

14. USE. At Honolulu and Balboa IFSS/ARTCC, FASS Plan 59 installations.
15. RESULTS OF MODIFICATION. Will provide Agency personnel with a means of stopping the LEXD distributor at the same time the transmitter is stopped.
16. CORRECTIONS TO DRAWINGS. Western Union drawings detailed in paragraph 4 shall be corrected to indicate the wiring changes.
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate and/or desirable.
18. CORRECTIONS TO RECORDED DATA. None.
19. IMPLEMENTATION. Upon receipt of this modification on installed equipment.


B. J. Vierling, Director
Systems Maintenance Service

CHAPTER 66. MODIFICATION - ADIS EQUIPMENT (23)
TRANSMITTER DISTRIBUTOR, TYPE LEXD-8
I/C STATIONS

1. OBJECT.

- a. To provide a means of stopping the transmission of traffic from a low speed transmitter distributor (LEXD-8) into Area circuits.
- b. Will provide a visual signal while LEXD-8 is transmitting into Area circuits.
- c. To provide a means of unblinding of the reperforator (IRPE) immediately upon stopping transmission from LEXD-8 into Area circuits.

2. REASON FOR MODIFICATION.

- a. Will eliminate present practice of opening module drawers containing logic elements controlling LEXD-8 transmission to Area circuits.
- b. Will eliminate present practice of pulling open relay logic module drawers and physically latch relay controlling the un-blinding of Area circuit IRPE in the L/H converter unit.
- c. Will provide separation between relayed traffic and area station traffic.
- d. The condition of each LEXD-8 (operated or non-operated) in the H/L converter unit will be visually displayed by means of an indicator lamp.

3. APPLICATION. This modification shall be accomplished on all ADIS equipment at all I/C stations.

4. REFERENCES.

- a. Teletype Corporation Specification 5990S, actual wiring diagrams 5059WD, 5060WD, 5061WD and 5182WD.
- b. Teletype Corporation specification 5990S, schematic wiring diagrams 5004WD and 5181WD.
- c. Attachments FIG. 1 and FIG. 2 supplied.

5. MATERIALS REQUIRED.

- a. Three (3) 125 volt, DPST switches.
- b. Three (3) indicator lamps complete with bases. (DIALCO number 95410 or equal)
- c. One hundred-fifty (150) feet AWG #24, stranded polyethelene insulation or equal.

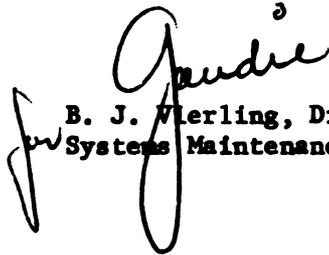
6. SOURCE OF MATERIAL. Station stock or local purchase.**7. TOOLS OR TEST EQUIPMENT REQUIRED. Standard station miscellaneous hand tools.****8. WORK TO BE PERFORMED BY. As programmed by the Regions.****9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the Regions.****10. ESTIMATED TIME REQUIRED. Eight (8) man-hours per ADIS I/C stations.****11. DISPOSITION OF SURPLUS PARTS. None.****12. MODIFICATION PROCEDURE.****a. Mounting of switches and lamp bases.**

- a.1 Switches and indicator lamp bases shall be mounted to the left of monitor printer push keys in AC-290 cabinet.
- a.2 The switch and lamp shall line up with the top three rows of push keys and be centered between the white line and frame edge of cabinet. (See attachment Fig. No. 1 for location of mounting holes)

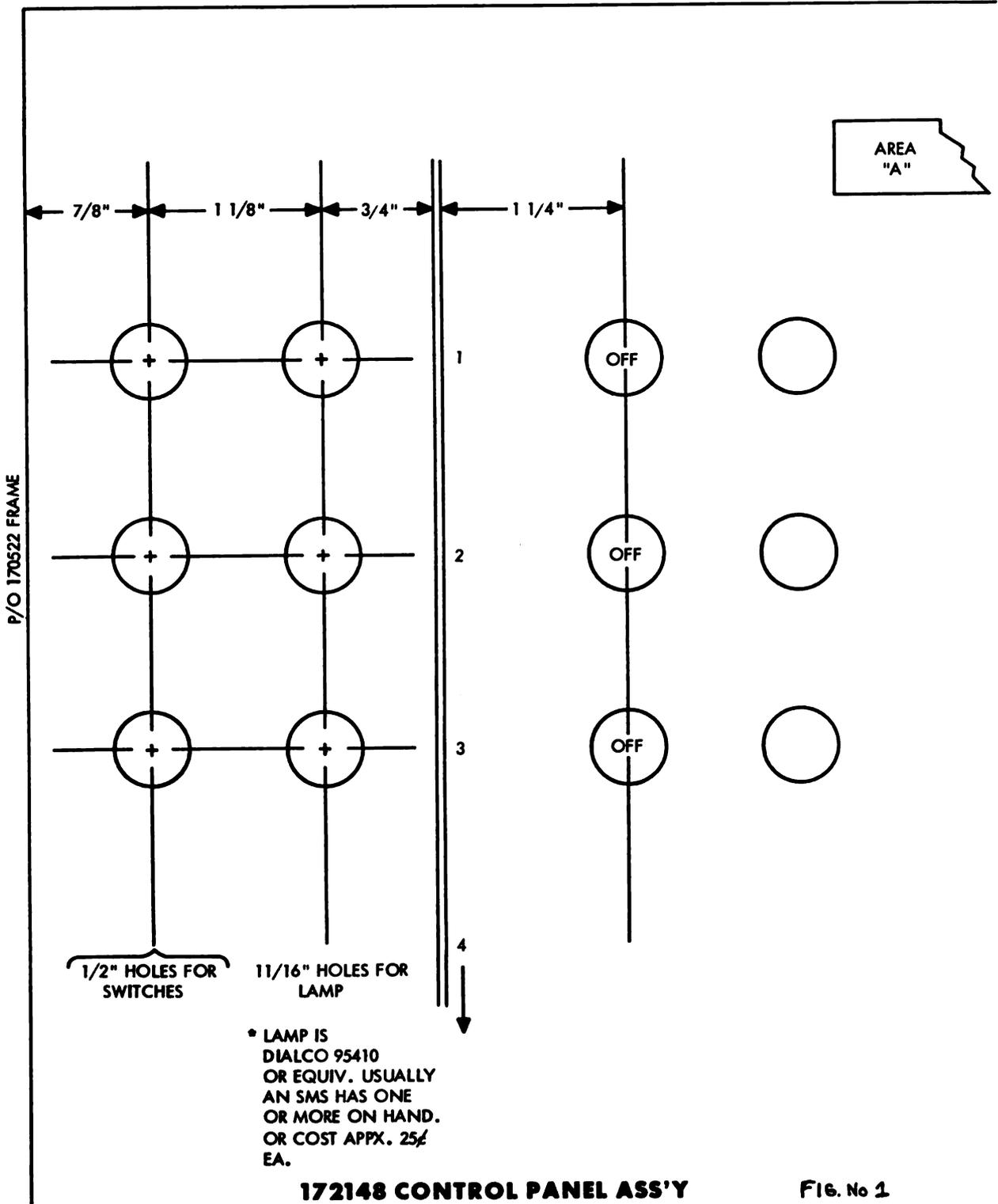
b. Area Circuit A - Connect wires from switch number one to terminals number six (6) and seven (7) of TB-3030, symbol LF of wiring diagram 5059WD. When switch is ON these terminals are shorted and the indicator lamp will be energized.**c. Area Circuit B - Connect wires from switch number two to terminals number six (6) and seven (7) of TB-3032, symbol LH of wiring diagram 5060WD. When switch is ON these terminals are shorted and the indicator lamp will be energized.**

- d. Area Circuit C - Connect wires from switch number three to terminals number six (6) and seven (7) of TB-3034, symbol LJ of wiring diagram 5061WD. When switch is ON these terminals are shorted and the indicator lamp is energized.
 - e. Power is supplied to indicator lamps (5.5 VAC) from terminals twelve (12) and fourteen (14) of TB-7005, symbol BA of wiring diagram 5182WD. (See attachment Fig. No. 2 for wiring details.)
 - f. Connect the indicator lamps to associated switches so that lamp will be energized when terminals TB-3030, TB-3032 or TB-3034 are shorted; this will indicate that the LEXD8 associated with that circuit is not operating.
 - g. Identify in some acceptable manner, the number of the switch-lamp combination, the Area circuit which the switch controls and the ON-OFF position of the switch.
13. TEST AFTER MODIFICATION.
- a. Make a visual inspection of the work to determine general appearance and workmanship.
 - b. Make an operational check to determine that functions of the switches and lamps are as outlined in paragraphs (1) and (15).
14. USE. At all ADIS I/C stations.
15. RESULTS OF MODIFICATION. Provides one switch and one indicating lamp per Area circuit to perform the following functions:
- a. Personnel can control the LEXD8 on each Area circuit by operating a switch and have a visual indication that the LEXD8 is either transmitting data to the circuit or is not operating.
 - b. Will immediately unblind the LRPE when the H/L converter unit is shut down.
 - c. Will initiate the transmission of eight (8) line feed characters automatically after each H/L converter's LEXD8 has stopped
16. CORRECTIONS TO DRAWINGS.
- a. Correct Teletype Corporation specification 5990S, Schematic Wiring Diagram 5181WD, lightly in red pencil.

- b. Correct Teletype Corporation specification 5990S, Actual Wiring Diagrams 5059WD, 5060WD and 5061WD, lightly in red pencil.
- 17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.
- 18. CORRECTIONS TO RECORDED DATA. None.
- 19. IMPLEMENTATION. Upon receipt of this chapter.

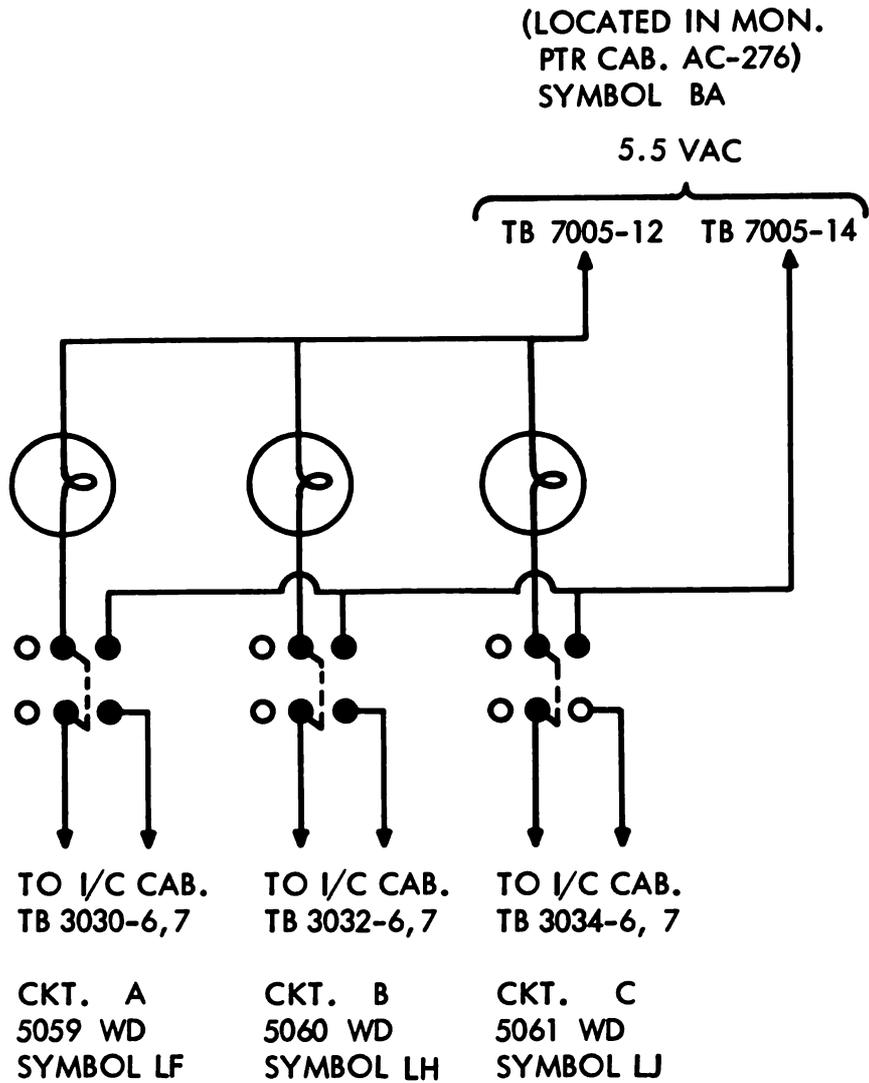

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Enclosures:
Sketch of Control Panel Ass'y,
Fig. No. 1
Area Circuit Wiring Diagram,
Fig. No. 2



172148 CONTROL PANEL ASS'Y

FIG. No 1



**ADIS - CONTROL OF AREA CIRCUIT
TRANSMISSION**

FIG.No2

**CHAPTER 67. MODIFICATION - FASS - PLAN 59(7)
RELOCATION OF DIVERSION INDICATOR (QSP)
IN AFTN MESSAGE FORMAT**

1. **OBJECT.** This modification changes the location of the Diversion Indicator, in the message format, from the Diversion and Shortened Address Section to the Heading Section.
2. **REASON FOR MODIFICATION.** Recent changes to regulations in the formulation of Aeronautical Fixed Telecommunications Network message format, requires that the Diversion Indicator (QSP) sequence of characters be automatically recognized and processed by a FASS.
3. **APPLICATION.** This modification has been accomplished at FASS Plan 59 installations at Honolulu and Balboa IFSS/ATCC facilities.
4. **REFERENCES.**
 - a. W. U. Specification No. 12701-B-2 for Cabinet Framework 9937-A.
 - b. W. U. Specification No. 11989-A-3, Line Send-Receive Cabinet 9938-A.
 - c. W. U. Specification No. 13122-A, Line Send-Receive Cabinet 9938-A, Theory of Operation.
 - d. W. U. Specification No. 12732-B-2, Start of Message Reading Chassis (S.O.M.) #9988-A and #9988.1-A.
 - e. W. U. Drawing No. 195083-B-10 Plan 59 - Line Receiving Position - Message Number Comparison Circuits.
 - f. W. U. Drawing No. 311355-A-4 Plan 59 - Line Receiving Position - QSP Reading Circuit.
 - g. W. U. Drawing No. 256340-A-7, Cabinet Framework 9937-A, Item 39, Bracket.
5. **MATERIALS REQUIRED.**
 - a. Cabinet Framework 9937-A, W. U. Specification #12701-B.
 - b. 1 - Bracket, S.O.M. Mounting, W. U. Drawing #256340.

- c. 4 - Nut, Hex, #8-32 UNC-2B, Steel, Cadmium Plated.
 - d. 4 - Screw, Machine #8-32 UNC-2A X $\frac{1}{2}$ " R. H. Steel, Cadmium Plated.
 - e. 4 - Washer, Lock #8 A.S.A. Internal-Tooth, Steel, Parkerized.
 - f. Line-Receive Cabinet 9938-A, W. U. Specification #13122-A.
 - g. 1 - I.D.P. 173609 - Diode IN601.
 - h. 1 - I.D.P. 226159 - Receptacle 26-190-32, Pin Polarization, 32 Contacts, Amphenol Electric Company.
 - i. 1 - I.D.P. 744276 - Start of Message Chassis 9988.1, W. U. Specification 12732-B-2.
 - j. 2 - Screw, Machine 4-40 UNC-2A X $\frac{1}{2}$ " R. H. Steel, Cadmium Plated.
 - k. 2 - Washer, Lock #4, Internal-Tooth, Parkerized.
 - l. One hundred (100) feet of #22 AWG, stranded, black, polyethylene insulation or equal wire.
 - m. Twenty-five (25) feet of #18 AWG, stranded, black, polyethylene insulation or equal wire.
6. SOURCE OF MATERIAL. Station stock or local purchase.
7. TOOLS OR TEST EQUIPMENT REQUIRED. Standard station miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. As programed by the Region.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the Region.
10. ESTIMATED TIME REQUIRED.
- a. Honolulu, IFSS/ATCC facility - 604 man-hours.
 - b. Balboa, IFSS/ATCC facility - 288 man-hours.
11. DISPOSITION OF SURPLUS PARTS. None.

12. MODIFICATION PROCEDURE.

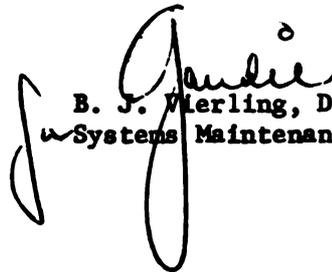
1. Referring to W. U. Specification #12701-B-2 and perform the following steps.
2. Using Item 39, Drawing 256340-A-7 as a template, drill four #16 (.177) holes located as shown on attached sketch.
3. Mount bracket (Item 39), Drawing 256340-A-7 to existing shelf with lockwashers and nuts as shown on attached sketch.
4. Referring to W. U. Specification #11989-A-3, perform the following steps.
5. Mount Amphenol receptacle to bracket with two 4-40 screws and lockwashers as shown on attached sketch and label receptacle QSP.
6. Plug S.O.M. Reading Chassis 9988.1-A into QSP receptacle added in par. 12, step 5.
7. Install IN601 Diode between LCP-TS1-1 and LCP-TS2-1 with cathode on LCP-TS1-1.
8. Remove existing wire between RB4-24U and SNI-B3.
9. Add a new wire between RB4-24U and LCP-TS2-1.
10. Add a new wire between LCP-TS1-1 and QSP11.
11. Add a new wire between LCP-TS1-1 and SNI-B3.
12. Add a new wire between QSP-11 and RB4-1L.
13. Add a new wire between QSP-27 and SNI-A15.
14. Add a new wire between QSP-1 and SOM-21.
15. Add a new wire between QSP-2 and SOM-22.
16. Add a new wire between QSP-3 and SOM-23.
17. Add a new wire between QSP-5 and SOM-25.
18. Add a new wire between QSP-17 and SOM-11.

19. Add a new wire between QSP-18 and SOM-12.
20. Add a new wire between QSP-20 and SOM-14.
21. Add a new wire between QSP-21 and SOM-15.
22. Add a new wire between QSP-6 and SOM-29.
23. Add a new wire between QSP-13 and TS7-2. (#18 AWG Wire)
24. Add a new wire between QSP-15 and NM-B16. (#18 AWG Wire)
25. Add a new wire between QSP-16 and FAC-13-2. (#18 AWG Wire)
26. Add a new wire between QSP-27 and SNI-A15. (#18 AWG Wire)
27. Add a new wire between QSP-29 and TS7-3. (#18 AWG Wire)
28. Add a new wire between QSP-31 and WC-TS2-7. (#18 AWG Wire)
29. Add a new wire between QSP-32 and FT2-4. (#18 AWG Wire)

Note: When the Diversion Indicator (QSP) is moved from the Diversion and Shortened Address Section to the Heading Section, remove wire between RB4-1L and SNI-B7.

13. TEST AFTER MODIFICATION. Referring to W. U. Specification #13122-A, check operation of the Sequence Switch (SQSW) and Sequence Number Indicator (SNI). Add the following changes to page 23 of subject specification and conduct operational tests.
 1. "Under the heading Sequence Number Check omit the last three sentences in the second from the last paragraph.
 2. Between the second and the third from last paragraph add a new paragraph as follows:
 - a. With the SNI main switch on pt. 10, the cathode of VI in the S.O.M. Reading chassis 9988.1 is grounded. If the sequential character combination QSP is read thyatron VI in the 9988.1 chassis will fire and operate relay NCW. When contacts 11 and 12 of NCW close the QSP lamp will light and the battery for the Wrong comp. light will be grounded out. Operation of NCW places a ground, thru contacts 5 and 6 of NCW and 4T and 5T of NCI, on the AUX. Xtr. Stop lead of the Electronic Transmitter causing the Loop Gate Transmitter to stop stepping."

14. USE. At Honolulu and Balboa IFSS/ATCC Plan 59 facilities.
15. RESULTS OF MODIFICATION. The Plan 59 FASS installations at Honolulu and Balboa, IFSS/ATCC facilities are now modified and able to process messages in accordance with current regulations for message format, established by Amendment 39 to Annex 10, governing the operation of the Aeronautical Fixed Telecommunications Network.
16. CORRECTIONS TO DRAWINGS. None. (W. U. Specification listed under paragraph 4 supplies all required corrections)
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate and/or desirable.
18. CORRECTIONS TO RECORDED DATA. None.
19. IMPLEMENTATION. This modification has been accomplished by a negotiated contract between the Agency and Western Union Telegraph Company.

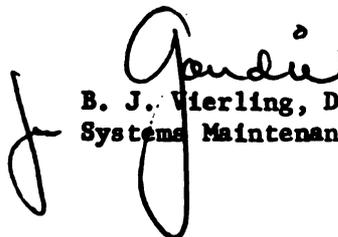

B. J. Werling, Director
Systems Maintenance Service

CHAPTER 69. MODIFICATION - FASS - PLAN 59(8);
8432.5A AND 8432.6A TAPE CRIMPERS

1. OBJECT. This modification will provide a means of automatic start-stop control of tape crimpers, Western Union types 8432.5A and 8432.6A, installed in the line send-receive cabinets.
2. REASON FOR MODIFICATION. Will increase reliability and reduce preventive maintenance requirements on the tape crimpers.
3. APPLICATION. This modification shall be accomplished to Western Union type 8431.5A and 8432.6A tape crimpers at FASS, PLAN 59 installations at Honolulu and Balboa IFSS/ATCC facilities.
4. REFERENCES.
 - a. Western Union specification 13122-A, for line send-receive cabinet 9938-A, schematic wiring drawings 195156 and 195157.
 - b. Modified tape crimper wiring sketch No.1.
5. MATERIALS REQUIRED. The following list of materials are required for the modification of tape crimper, Western Union type 8432.6A. No new material is required to modify Western Union type 8432.5A tape crimper.
 - a. Mercury switch W/7" flexible lead, Minneapolis-Honeywell type AS408D1 or equal.
 - b. Tape guide, Western Union part number 401177.
 - c. Tape arm, Western Union part number 401178.
 - d. Switch bracket, Western Union part number 401179.
 - e. Spacer, Western Union part number 401180.
 - f. Stop collar, Western Union part number 401181.
 - g. Miscellaneous hardware.
6. SOURCE OF MATERIAL.
 - a. Parts peculiar, Operating Materials Branch, procurement from Western Union Telegraph Company.
 - b. Parts common, local stock or local purchase.

7. TOOLS OR TEST EQUIPMENT REQUIRED. Standard station miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the Region.
10. ESTIMATED TIME REQUIRED. One man-hour per tape crimper.
11. DISPOSITION OF SURPLUS PARTS. Place in station stock
12. MODIFICATION PROCEDURE. Referring to Western Union specification No. 13122-A, perform the following steps:
 - a. Remove Western Union Type 8432.A, tape crimper from bottom shelf and:
 1. Remove and reconnect wires in connection box as shown in sketch No. 1A.
 2. Adjust existing mercury switch to close with slight movement of tape arm.
 3. Adjust clutch mechanism for maximum torque.
 - b. Remove Western Union Type 8432.6A, tape crimper from top shelf and:
 1. Remove existing tape guide (W.U. P/N 401083) and replace with tape guide (W.U. P/N 401177).
 2. Install tape arm (W.U. P/N 401178) to tape guide (W.U. P/N 401177).
 3. Install switch bracket (W.U. P/N 401179) and mercury switch (W.U. P/N AS408D1) to tape arm.
 4. Make adjustments of mercury switch and clutch mechanism as outlined in paragraph 2 and 3a.
 5. Remove and reconnect wires as shown in sketch No. 1B.
13. TEST AFTER MODIFICATION. Install tape crimpers in line send-receive cabinets and observe operation. Tape crimper motor should be "off" when in idle condition and turns "ON" when tape starts to feed.

14. USE. At Honolulu and Balboa IFSS/ATCC Plan 59 facilities.
15. RESULTS OF MODIFICATION. This modification will result in more reliable operation by assuring positive tape feeding, less wear of parts and the reduction of maintenance on the tape crimpers.
16. CORRECTIONS TO DRAWINGS. Correct Western Union wiring schematics, numbers 195156 and 195157, lightly in red pencil.
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate and/or desirable.
18. CORRECTIONS TO RECORDED DATA. None.
19. IMPLEMENTATION. Upon receipt of this modification on installed equipment.
20. RECOGNITION. This modification was developed from the Pacific Region's Employee Suggestion program.


B. J. Vierling, Director,
Systems Maintenance Service

CHAPTER 70. CA-405 PRINTER TEST SET (1)

1. OBJECT. To improve the capabilities for the testing and adjustment of the RY-33 line relays.
2. REASON FOR MODIFICATION. To update the CA-405 Printer Test Set making the performance essentially the same as Printer Test Set CA-1385.
3. APPLICATION. This modification shall be accomplished at all facilities having the CA-405 Printer Test Set.
4. REFERENCES.
 - a. CA-405 Printer Test Set Instruction Book DWG #WG-1177-18.
 - b. Drawing FMD-B-506. (attached)
5. MATERIALS REQUIRED. CA-405 Modification Kit FSN 000-003-2600.
6. SOURCE OF MATERIALS. The material for this modification is available in kit form from the Operating Material Division, (OMD) on Federal Stock No. 0000-003-2600.
7. TOOLS AND/OR TEST EQUIPMENT REQUIRED. Miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of material contained in modification kit.
10. ESTIMATED TIME REQUIRED. Three hours per unit.
11. DISPOSITION OF SURPLUS PARTS. Discard.
12. MODIFICATION PROCEDURE. Refer to wiring diagram in CA-405 Instruction Book and drawing FMD-B-506.
 - a. Remove instrument panel from case.
 - b. Replace potentiometer P-8 (500 ohm) with new 7,500 ohm potentiometer.
 - c. Remove 1½ volt battery P-20 and battery clamp.

- d. Install terminal stock Cinch-Jones 3-140 and marker strip MS 3-140 as per drawing FMD-B-506.
- e. Connect 10,000 ohm 1 watt resistor across terminals 1 and 3 of the new terminal strip. Move wires from original resistor P-10 (700 ohm) to terminals 1 and 3 of new terminal strip.
- f. Remove original resistor P-10 700 ohm.
- g. Install the 22.5 volt battery with clamp on the inside rear position of case. (See drawing FMD-B-506)
- h. Connect battery to connecting block P-22 marked + and - using the black and white wires and #6 soldering lugs from kit.
- i. See Plate No. 122, CA-405 Instruction Book. P-12 resistor originally is located directly behind meter P-3 and below the meter terminals. To obtain sufficient space for the 22-5 volt battery it will be necessary to remove the resistor from the meter terminals and replace it so as to be above the terminals. Care must be exercised to observe polarity when replacing leads.
- j. Replace the instrument panel on case.

13. TESTS AFTER MODIFICATION.

- a. With no power connected to the test set, adjust meter needle to zero.
- b. Insert a line relay having clean contacts into relay receptacle, remove cover.
- c. Switch to Relay Bias position.
- d. With an orange stick close relay contact. Adjust meter deflection potentiometer for full scale reading. Note if possible to get full scale reading. If not, check wiring and battery voltage.

14. USE. At all facilities having the CA-405 Printer Test Set.

15. RESULTS OF MODIFICATION. Improved capabilities for testing and adjusting the RY-33 line relays, by increasing battery and voltage.

16. CORRECTION TO DRAWINGS. Correct CA-425 Printer Test Set drawing in Instruction Manual or attached FMD-B-506 drawing to cover of manual.
17. CORRECTIONS TO INSTRUCTIONS. None.
18. CORRECTIONS TO RECORDED DATA. None.


B.J. Vierling, Director,
Systems Maintenance Service

Attachment:
Drawing FMD-B-506

CHAPTER 71. MODIFICATION - BDIS EQUIPMENT (1)
LOW SPEED SEDET MODULE

1. OBJECT. To limit the action of the condition code correct logic.
2. REASON FOR MODIFICATION. To meet operational requirements.
3. APPLICATION. This modification shall be accomplished at all BDIS Interchange Centers.
4. REFERENCES. Teletype Corporation diagrams 5523WD, 5524WD Sedet Module.
5. MATERIALS REQUIRED. None.
6. SOURCE OF MATERIALS. None required.
7. SPECIAL TOOLS AND/OR TEST EQUIPMENT REQUIRED. Miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. Field Maintenance personnel or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. If not previously accomplished, upon receipt of this directive.
10. TIME REQUIRED. Two hours per BDIS Interchange Center.
11. MODIFICATION PROCEDURE.
 - a. Using Teletype Corporation's Actual Wiring diagram 5524WD. Locate EC 501 position Z2302 in Low Speed Sedet Modules.
 - b. Remove and tape leads from terminals E and F.
 - c. Replace cord EC 516, Power Pulser, in position Z2327 in all Low Speed Sedet Modules.
 - d. Remove cord EC 516, Power Pulser, in position Z2327 from all High Speed Sedet Modules.
12. DISPOSITION OF SURPLUS PARTS. Retain in station stock.
13. TEST AFTER MODIFICATION. By using suitable test tapes determine that the following conditions exist:

(on low speed circuitry)

- a. An incorrect first character of the condition code will be corrected to CR.
- b. An incorrect second character of the condition code will not be corrected.
- c. An incorrect third and last character of the condition code will not be corrected.

(on high speed circuitry)

- d. There will be no correction of any character of the condition code.

14. USE. At all BDIS Interchange Centers and equipment used for BDIS installation at the Aeronautical Center.

15. RESULTS OF MODIFICATION.

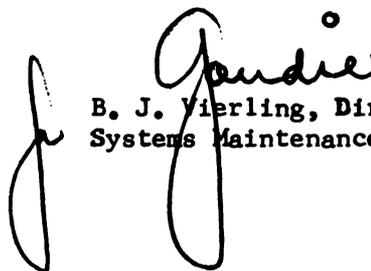
- a. The ICAO end of line code CR CR LF will not be changed to the condition code. This will eliminate over printing caused by losing the LF character.
- b. LF CR LTRs, originating from the APULS unit, getting on the high speed line due to unique circumstances will be changed to CR CR LTRs and will not give an incorrect message count.
- c. The first character only of the condition code will be corrected on the low speed circuit, this can correct garble of the first character, caused by faulty equipment start after an idle period.

16. CORRECTION TO DRAWINGS. Correct Teletype Corporation drawings 5523WD and 5524WD.

17. CORRECTION TO INSTRUCTIONS. Correct associated instructional material as appropriate and/or desirable.

18. CORRECTION TO RECORDED DATA. None (Note that modification has been made).

19. COORDINATION. This modification has been coordinated with IM-140 and AT-300.


B. J. Vierling, Director
Systems Maintenance Service

CHAPTER 72. MODIFICATION - FASS - PLAN 59(9)
CODE CARD READING ASSEMBLY
WESTERN UNION TYPE 9743-A

1. OBJECT. This modification increases the switching speed of routing indicator diode matrices of code card reading assemblies, Western Union Type No. 9743-A, located in Director Translator Cabinet, Western Union Type 9940-A.
2. REASON FOR MODIFICATION. To increase the number of routing indicators which may be processed by the switching code transistor or the NO Code transistor circuit cards.
3. APPLICATION. This modification has been accomplished at FASS, Plan 59 installations at Honolulu and Balboa IFSS/ATCC facilities.
4. REFERENCES.
 - a. Western Union Specification No. 11990-A.
 - b. Western Union Specification No. 12378-B.
 - c. Western Union Specification No. 12382-B.
5. MATERIALS REQUIRED. Seven-hundred and fifty (750) IN482 Diodes.
6. SOURCE OF MATERIAL. Furnished by Western Union Telegraph Company.
7. TOOLS OR TEST EQUIPMENT REQUIRED. Standard station miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the Region.
10. ESTIMATED TIME REQUIRED. Three hundred (300) man-hours at each FASS Plan 59 installation.
11. DISPOSITION OF SURPLUS PARTS. Place IN772 Diode in station stock.

12. MODIFICATION PROCEDURE. On Diode Card 9747-A, replace IN772 Diode mounted to terminal 0 with IN482 Diode with anode of diode on terminal 0.
13. TEST AFTER MODIFICATION. After the cards are completely assembled and all soldering operations are completed, each diode on every card shall be tested to check that the following requirements are met.
 - a. On diode IN772, with approximately 50 milliamperes DC flowing through the diode in the forward direction, the voltage drop across the diode shall be less than 1 (one) volt. With 50 volts DC across the diode in the reverse direction, the current flow shall be less than 50 microamperes. On diode IN482, with approximately 100 milliamperes DC flowing through the diode in the forward direction, the voltage drop across the diode shall be less than 1.1 volt. With 35 volts DC across the diode in the reverse direction, the current flow shall be less than 0.25 microampere.
14. USE. At Honolulu and Balboa IFSS/ATCC Plan 59 facilities.
15. RESULTS OF MODIFICATION. The Plan 59 FASS installations at Honolulu and Balboa IFSS/ATCC facilities are now modified and are able to handle an increased number of routing indicators. These routing indicators may be patched to a switching code transistor or the NO code transistor. The Diode Card 9747-A has been modified to Diode Card 9747-B.
16. CORRECTIONS TO DRAWINGS. None required as Western Union Specification 12382-B, Appendix No. 1, issued 8/30/62 supplies all technical information required.
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate and/or desirable.
18. CORRECTIONS TO RECORDED DATA. None.

for P. H. Forrest McKeel
B. J. Vierling, Director,
Systems Maintenance Service

CHAPTER 73. SERVICE B LOW SPEED RELAY
R/T CABINET LBAC 201

1. OBJECT. To provide torn tape operation when relay facility is used for Service B Data Interchange System (BDIS) backup.
2. REASON FOR MODIFICATION. To meet operational requirements.
3. APPLICATION. This modification shall be accomplished at all relay facilities providing backup for the Service B Data Interchange System (BDIS).
4. REFERENCE. Teletype Corporation drawing WD 3692; Reperforator Transmitter Cabinet LBAC 201; Station Wiring Diagram.
5. MATERIALS REQUIRED.
 - a. Two DPDT Toggle Switches.
 - b. Several feet of hookup wire.
6. SOURCE OF MATERIALS. Local stock.
7. TOOLS AND/OR TEST EQUIPMENT REQUIRED. Miscellaneous small hand tools.
8. WORK TO BE PERFORMED BY. Maintenance technicians at the facilities involved or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of this notice.
10. ESTIMATED TIME REQUIRED. Three hours.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE. All terminal strips and relays are not wired identically at all facilities. The terminal numbers given in these instructions are those at a Central Region installation. At facilities not identically wired the terminals and relay contacts serving the same function should be used.

- a. Viewing cabinet from the front, locate and drill holes as follows (Dimensions Center to Center).
 1. Right R/T Set drill hole for toggle switch $2\frac{1}{2}$ " to the left of STOP switch.
 2. Left R/T Set drill hole for toggle switch $2\frac{1}{2}$ " to the right of START switch.

Lower Terminal Board AF, left R/T Set, AF Relay

- b. Move lead carrying AF relay holding voltage (- 48 volts through NC stunt box EOM contact slot 8) from terminal 54 to terminal 50.
- c. Connect one transfer contact of added switch to terminal 50.
- d. Connect lower switch contact associated with above (make in the down position) to terminal 54. This places one side of the added switch in series with the AF relay holding voltage. The circuit being completed with the switch in the down or NORMAL operation position.
- e. Connect remaining transfer contact of this switch to terminal 49 (+ 48 volts).
- f. Connect lead from upper switch contact (make contact in the up position) to terminal 60. This will apply + 48 volts to the AF relay coil when the switch is placed in the up or CONTINUOUS position.

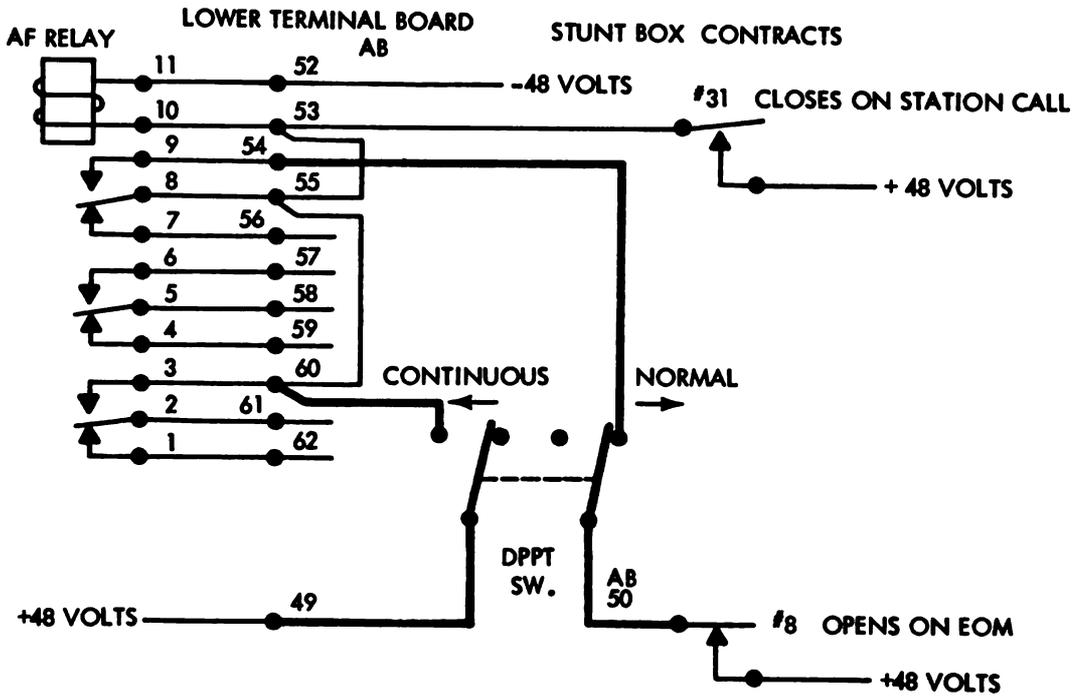
Lower Terminal Board AF, Right R/T Set. AG Relay

- g. Using the other added switch and appropriate AB terminals 65, 74, 71 and 49. Wire as indicated in attached drawing. Results will be the same for the Right R/T Set, AG Relay as obtained by wiring in first added switch controlling Left R/T Set and AF Relay.
- h. Mount switches on front panel making sure that with switches in the downward position operation will be NORMAL and when in the upward position operation will be CONTINUOUS.
- i. Using a Dymo Label Maker or by other suitable means prepare two labels CONTINUOUS, mount above added switches also two labels NORMAL, mount below added switches.

13. TESTS AFTER MODIFICATION

- a. Prepare test tape simulating Service B messages part of the messages containing the facility identification and sequence that would normally initiate a relay through the facility and part of the test messages and identifiers such as would normally be ignored and not initiate a relay action.
 - b. Run the test tape through both the right and left hand units, with the added switches in the NORMAL position.
 - c. Note if messages normally relayed is perforated and that other messages are not perforated. Performance being identical to operation prior to modification.
 - d. Run the test tape through both units again with the added switches in the CONTINUOUS position.
 - e. Note if all messages are perforated.
14. USE. At all Service B relay stations providing backup for Service B Data Interchange System (BDIS).
15. RESULT OF MODIFICATION. Messages may be relayed to another circuit without repunching tape to include Relay Station identification before each message.
16. CORRECTIONS TO DRAWINGS. Using red pencil add to drawings the additional wiring indicated by heavy lines on the attached sheet.
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.
18. CORRECTIONS TO RECORDED DATA. None (Note that modification has been made).

LEFT RT SET



NOTE: HEAVY LINES INDICATE REQUIRED CHANGE

RIGHT RT SET

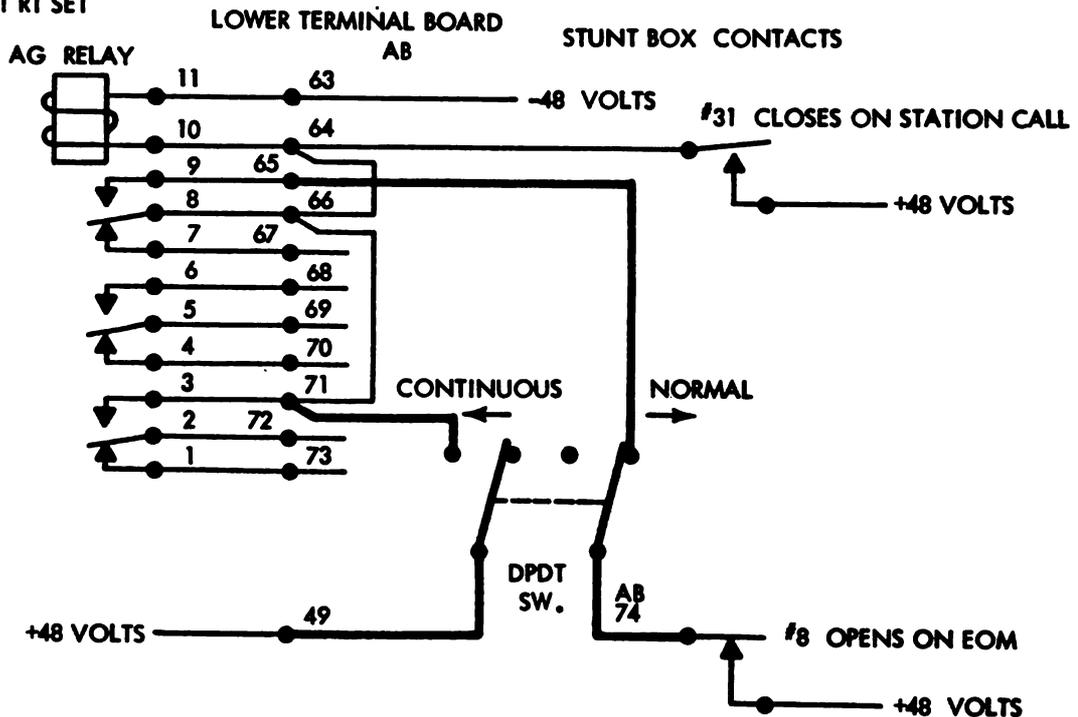


FIG. 1

CHAPTER 74. MODIFICATION--BDIS EQUIPMENT (2)
COMBINATION CONTROL CABINET LCAC295AB

1. OBJECT. To provide automatic transmission of messages received in a LCAC291AB cabinet (installed on special R/O circuit) by controlling the operation of the LBXD-8 transmitter distributor when a slack tape condition is recognized by the associated logic group.
2. REASON FOR MODIFICATION. To provide a means to energize LBXD-8 in the H/L converter for transmission of messages without automatic call-up from an associated APULS unit or a manually operated start button.
3. APPLICATION. Will be installed in all combination control cabinets LCAC295AB at facilities where the Air Traffic Service has determined that an automatic start for the LBXD-8 associated with the special LCAC291AB cabinet on the receive only circuit.
4. REFERENCES. Teletype Corporation control cabinet wiring 554WD, sheet 26, item 16, titled LBXD Enable and Starting Circuit Theory paragraph (c) page 2-41 of Bulletin 277B.
5. MATERIALS REQUIRED.
 - a. One wire strap AWG #24 stranded polyethelene insulation or equal.
6. SOURCE OF MATERIALS. Station stock.
7. TOOLS AND/OR TEST EQUIPMENT REQUIRED. Standard station miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of this Notice.
10. ESTIMATED TIME REQUIRED. One man-hour per LBAC291AB cabinet.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE. Locate J3146 and install wire strap between terminals A7 and A8 in LCAC291AB cabinet.

13. TESTS AFTER MODIFICATION. Place modified LCAC291AB cabinet on operating circuit and collect traffic on tape. Observe operation of tight tape control. When a slack tape condition occurs the LBXD-8 should start operating and stop when a tight tape condition occurs again.
14. USE. At all BDIS Relay Stations equipped with a special LCAC291AB cabinet for controlling BDIS receive only circuits message transmission. Not to be used with Rejector Cabinet.
15. RESULT OF MODIFICATION. The LBXD-8 transmitter distributor start circuit on Operate CKT. No. 1 has been modified (LBXD-8 enable input has been tied directly to ground) for automatic start independent of a Rejector Cabinet.
16. CORRECTIONS TO DRAWINGS. Not applicable.
17. CORRECTIONS TO INSTRUCTIONS. Not applicable.
18. CORRECTIONS TO RECORDED DATA. None.

**CHAPTER 75. DIGITECH WORD GENERATOR, DT-103-2
LOW LEVEL SERIAL OUTPUT**

1. **OBJECT.** To provide a low level serial output suitable for testing ADIS/BDIS high speed modules.
2. **REASON FOR MODIFICATION.** To increase the capabilities of the word generator so it can be used in performing checks made previously by using test tapes.
3. **APPLICATION.** This modification shall be made to all Digitech DT-103-2, word generators now in use at the ADIS/BDIS facilities.
4. **REFERENCES.** DT-103-2 Instruction Booklet.
5. **MATERIALS REQUIRED.** Modification kit, Digitech Word Generator, S/N 0000-004-0200.
6. **SOURCE OF MATERIALS.** Order from OMD, Aeronautical Center.
7. **TOOLS REQUIRED.** Miscellaneous hand tools.
8. **WORK TO BE PERFORMED BY.** ADIS/BDIS Maintenance personnel or as determined by the Regional Director.
9. **WHEN MODIFICATION IS TO BE PERFORMED.** Upon receipt of material.
10. **ESTIMATED TIME REQUIRED.** Two man-hours.
11. **DISPOSITION OF SURPLUS PARTS.** None.
12. **MODIFICATION PROCEDURES.**

Reference DT-103-2 Instruction Booklet. Note: In the "Temporary Instruction Booklet," the drawings and figure numbers differ from those in the new Instruction Booklet. In this chapter, the number in parenthesis, following a figure number refers to the Temporary Instruction Booklet designation.

- a. Remove main chassis from case, following instructions given under Section 6 (Maintenance) of Instruction Booklet.

- b. Figure 8(2) will identify Assembly 2. Remove the four mounting screws.
- c. Figure 17(8A) will show location of the submodule 2A103-S2 in position 2A, nearest the terminating wires numbered 56 and 15.
- d. Locate 24,000 ohm resistor R10 from inspection of submodule and reference to figure 24(-).
- e. The wire lead from R10 enters an eyelet, of the Assembly 2 board on the opposite side of R10. Using an adjacent, connected, but unused eyelet, terminate one end of wire number 200 supplied as part of the modification kit. Terminate wire 200 in the same manner as the other numbered wires terminated on the card edge.
- f. Terminate the other end of wire 200 on pin "D" of the output jack 5J1, located on the rear of the unit. Pin "D" is the only unused pin on the periphery of jack 5J1. (Reference figures 14 and 18.)
- g. Check solder connections.
- h. Mount Assembly 2 on main chassis.
- i. Put main chassis back in case and secure.

13. TESTS AFTER MODIFICATION.

- a. Connect test leads with Amphenol plug and banana terminals to output jack 5J1. Insert banana terminals into test jacks on the ADIS or BDIS Hisred module not in operation. (AF P 6620.1 CH 29, Revision to Chapter 32.)
- b. Set the baud rate to 600 for ADIS or 750 baud for BDIS.
- c. Program the character select switches for the condition code and a valid identifier wired in the address selectors.
- d. Identify the High to Low converter that should respond to the call sequence. Remove the Digital subset from the input of this converter.
- e. Operate the Remote Listen - Test Switch on the Control Cabinet to the Remote Listen position, to remove the -6 volts applied to the Hisred. This will permit the Hisred to respond to the signals from the Word Generator.

- f. To stop the BRPE in DRPE, operate the Remote Listen - Test Switch to the Test position. The generator may then be switched to a space output without the punch feeding blank tape.
 - g. Once the generator is programmed for either an ADIS or BDIS recognition, other identifiers may be checked by changing characters.
 - h. After one sequence has been transmitted, the BRPE or DRPE will be enabled and punch the sequence. The motor start ($\frac{1}{2}$ second space signal) is not required prior to transmitting the test signal.
14. USE. At ADIS Interchange and S/R stations and at BDIS Interchange facilities.
15. RESULTS OF MODIFICATION. The low level serial output of the DT-103-2 Word Generator may be fed directly into the Hisred unit. By programming the eight variable characters produced by the DT-103-2, the Address Selectors and other modules may be checked. The High Speed punch enabled and its performance checked. The Word Generator can now be used to perform operation checks that formally involved using the test tapes and readers.
16. CORRECTIONS TO DRAWINGS. DT-103-2 Instruction Booklet.
- a. Figure 14(-), Assembly 2 show a wire and terminal from a point to the right of wire 56 (bottom lead) to cable. Label "200, 5J1-D."
 - b. Figure 14(-), 5J1 socket, show a wire from pin "D" to cable. Label "200, Assembly 2."
 - c. Figure 15(6), 5J1, show a wire from pin "E" to ground and a wire from pin "D" to wire from 10 of 2A103-S2 (Q1).
 - d. Figure 17(8A), Draw a line from 10, input of 2A103-S2(Q1) to a box containing the figure 200, to identify added wire 200. Near the box write in "serial output 5J1-D."
 - e. Figure 18(9), 5J1, Extend the line from pin "D", to a box containing figure 200, near the box label Assembly 2, 2A103-S2(10). Draw a line through the word "Spare."
17. CORRECTIONS TO INSTRUCTIONS. Note, where applicable in the testing procedures, the use of the DT-103-2 to simulate high speed signals in lieu of test tapes.
18. CORRECTION TO RECORDED DATA. None. (Note that modification was made.)

CHAPTER 76. ADIS(25) AUTOMATIC PROGRAM UNIT
HIGH SPEED APUHS II

1. OBJECT. To provide a means of stepping the APUHS Unit to a desired station for immediate scan when a station's traffic is missed or garbled.
2. REASON FOR MODIFICATION. To eliminate present procedure of pulling out station select switch logic module and physically latching the controlling relays.
3. APPLICATION. This modification shall be accomplished on the main and standby APUHS II units at the ADIS Control Interchange Centers, Kansas City, Missouri, Fort Worth, Texas and equipment used in the ADIS course at the FAA Academy.
4. REFERENCES.
 - a. Teletype Corporation Specification 5990S Vol. II, Actual Wiring Diagram 5030.
 - b. Teletype Corporation Specification 5990S Vol. I, Schematic Wiring Diagram 5029WD.
5. MATERIALS REQUIRED. Ten Feet AWG #24 stranded hookup wire, polyethylene insulation or equal.
6. SOURCE OF MATERIALS. Station stock or local purchase.
7. TOOLS AND/OR TEST EQUIPMENT REQUIRED. Miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. ADIS I/C maintenance technicians or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of this Notice or during next routine maintenance schedule.
10. ESTIMATED TIME REQUIRED. Two man-hours per module.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE.
 - a. Remove all wires from S1101 APUHS START switch.

- b. Solder the red wire and the red-white wire removed from S1101 together and tape.
 - c. Fold back and tape other wires removed from S1101.
 - d. Remove all wires from S1105 APULS-2 START switch.
 - e. Solder the two red wires together and tape.
 - f. Fold back and tape other wires removed from S1105.
 - g. Connect one terminal of S1101 and S1105 to TB-1124 ground.
 - h. Using existing cable routing connect remaining terminal of S1101 to the coil side of the K-1117 interrupter contact.
 - i. Using existing cable routing connect remaining terminal of S1105 to the coil side of the K-1121 interrupter contact.
 - j. Using a Dymo Label Marker or by other suitable means label S1101 "HORIZONTAL POSITIONING" on front panel.
 - k. Label S1105 "VERTICAL POSITIONING" on front panel.
13. TESTS AFTER MODIFICATION.
- a. Make a visual inspection of the modification wiring to determine general appearance and workmanship.
 - b. Using the test circuit determine by depressing the positioning switches that the scan may be started with the desired station. The position in scan order is indicated by the lamps on the APUHS monitor units.
14. USE. At ADIS control and alternate control I/C stations.
15. RESULT OF MODIFICATION. Two switches are provided that will enable ATC or maintenance personnel to control the APUHS scan by counting the number of times each switch is depressed.
16. CORRECTIONS TO DRAWINGS. Using red pencil correct Teletype Corporation Specification 5990S, Volume I, Drawings 5029WD and 5030WD in Volume II.

17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.
18. CORRECTIONS TO RECORDED DATA. None. (Note that modification was made.)

CHAPTER 77. BDIS (3) LOW SPEED REPERFORATOR LRPE-8
LETTERS FEED OUT DELAY CAM

1. OBJECT. To reduce delay in the diversion of low speed traffic to the high speed line during low density traffic periods.
2. REASON FOR MODIFICATION. To meet operational requirements.
3. APPLICATION. This modification shall be accomplished on all LRPE-8 low speed reperforators in the BDIS combination converter cabinets including standby equipment.
4. REFERENCES. Teletype Corporation Bulletins 255B and 1172B.
5. MATERIALS REQUIRED. One each four-second delay cam, Teletype Part No. 162796 for each LRPE-8 unit.
6. SOURCE OF MATERIALS. Station stock or order from OMD.
7. TOOLS AND/OR TEST EQUIPMENT REQUIRED. Miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. BDIS I/C maintenance technicians or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. During next routine maintenance schedule.
10. ESTIMATED TIME REQUIRED. Two man-hours per unit.
11. DISPOSITION OF SURPLUS PARTS. Label removed cam "LRPE-8 16sec letters delay cam No. 163351" and hold in station stock.
12. MODIFICATION PROCEDURE. Reference Teletype Corporation Bulletin 255B, figure 2-12 and Bulletin 1172B, figure 18.
 - a. Locate the 16-second letters feed out delay cam No. 163351 which is between the front metering ratchet No. 162795 and the adjusting plate No. 162797.
 - b. Mark position of the adjusting plate relative to the spring post to insure same length of tape feed out when reassembled.
 - c. Remove the 16-second delay cam and replace with the 4-second delay cam No. 162796.

- d. Position adjusting plate as indicated under "b".
13. TEST AFTER MODIFICATION. Using the test circuit and a test tape containing a message that will divert, measure the elapsed time between the end of message (EOM) and letters feed out action. This should be approximately four-seconds.
 14. USE: At all EDIS Interchange Centers.
 15. RESULT OF MODIFICATION. Messages will be diverted to the high speed line with less delay during periods of low traffic activity and an increased number of letters feed out operations will be transmitted to the high speed line. However, the increase can be tolerated under the present high speed line loading condition.
 16. CORRECTIONS TO DRAWINGS. None.
 17. CORRECTIONS TO INSTRUCTIONS. None.
 18. CORRECTIONS TO RECORDED DATA. None. (NOTE that the modification has been made)

**CHAPTER 78. MODIFICATION - TELETYPEWRITER
MDL 28 (VSL) TO RESTORE
DISTORTION MARGIN TO AN
ACCEPTABLE LEVEL**

1. **OBJECT.** To install a semi-conductor diode on the relay control group of VSL type MDL 28 teletypewriter equipments.
2. **REASON FOR MODIFICATION.** The VSL configuration of the MDL 28 teletypewriter equipments does not meet the distortion tolerance requirements of AF P 6620.13.
3. **APPLICATION.** This modification shall be made to all installed VSL type MDL 28 teletypewriter equipments.
4. **REFERENCES.**
 - a. Teletype Corporation Schematic Wiring Diagram 4744WD, 4743WD, and 3463WD.
 - b. Figures 1 and 2.
5. **MATERIALS REQUIRED.**
 - a. 1 each, 1N1489 semi-conductor diode. (Teletype Part No. 162358)
 - b. 1 each, Terminal strip, 2 terminal
 - c. 1 each, Nut, hexagon, 6-32.
 - d. 3 inches, Plastic tubing, size 22.
 - e. 4 inches, Wire, stranded, #22AWG, green.
 - f. 1 each, Lockwasher, split, #6.
6. **SOURCE OF MATERIAL.** Modification kits may be requisitioned from Supply Management Division (SMD) IM-980, beginning April 10, 1965 on Federal Stock Number (FSN) 0000-004-0700.
7. **TOOLS OR TEST EQUIPMENT REQUIRED.** Standard station miscellaneous hand tools.

8. WORK TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the Regions.
10. ESTIMATED TIME REQUIRED. One man-hour.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE.
 - a. Remove the relay control group (RCG), Teletype Part No. 179472, from the teletypewriter. Invert the RCG and install the terminal strip (Item 5b) on existing 6032 screw. (See Figure 1) Fasten terminal strip with nut and lockwasher. (Items 5c and 5f)
 - b. Mount the semi-conductor diode on the terminal strip with the arrow point toward the 32 point connector. (See Figure 1) Use plastic tubing (Item 5d) to insulate diode leads.
 - c. Unsolder the green wire from terminal 4 of the 32 point connector and resolder to the right terminal of added terminal strip. It may be necessary to remove green wire from cable harness for a distance of approximately two inches in order for wire to reach new location.
 - d. Using wire (Item 5e) jumper from the left terminal of added terminal strip to terminal 4 of the 32 point connector.
 - e. Insure that leads cannot short and replace the RCG.
13. TEST AFTER MODIFICATION. Conduct a distortion check using the CA-406 distortion transmitter or equivalent. Armature spring tension will require reajustment to obtain optimum operating tolerances. The printer unit should now meet the requirements stipulated in FA P 6620.13.
14. USE. At all facilities where the VSL type MDL 28 equipment and associated 179472 relay control group have been installed.
15. RESULT OF MODIFICATION. The addition of the 1N1489 diode in series with the OL relay coil lead will block the back EMF generated by the collapse of the selector magnet field. The insertion of this diode will restore the distortion margin to the acceptable level indicated in AF P 6620.13.
16. CORRECTIONS TO DRAWINGS. Teletype Corporation Drawing 3463WD and 3464WD shall be corrected in red pensil to reflect the addition of the diode.

17. CORRECTIONS TO INSTRUCTIONS. Correct associated instruction material as appropriate.
18. CORRECTIONS TO RECORDED DATA. None.
19. IMPLEMENTATION. Upon receipt of this modification on installed equipment.

Attachments 2

Drawing No. IMD-A-306

Drawing No. IMD-A-307

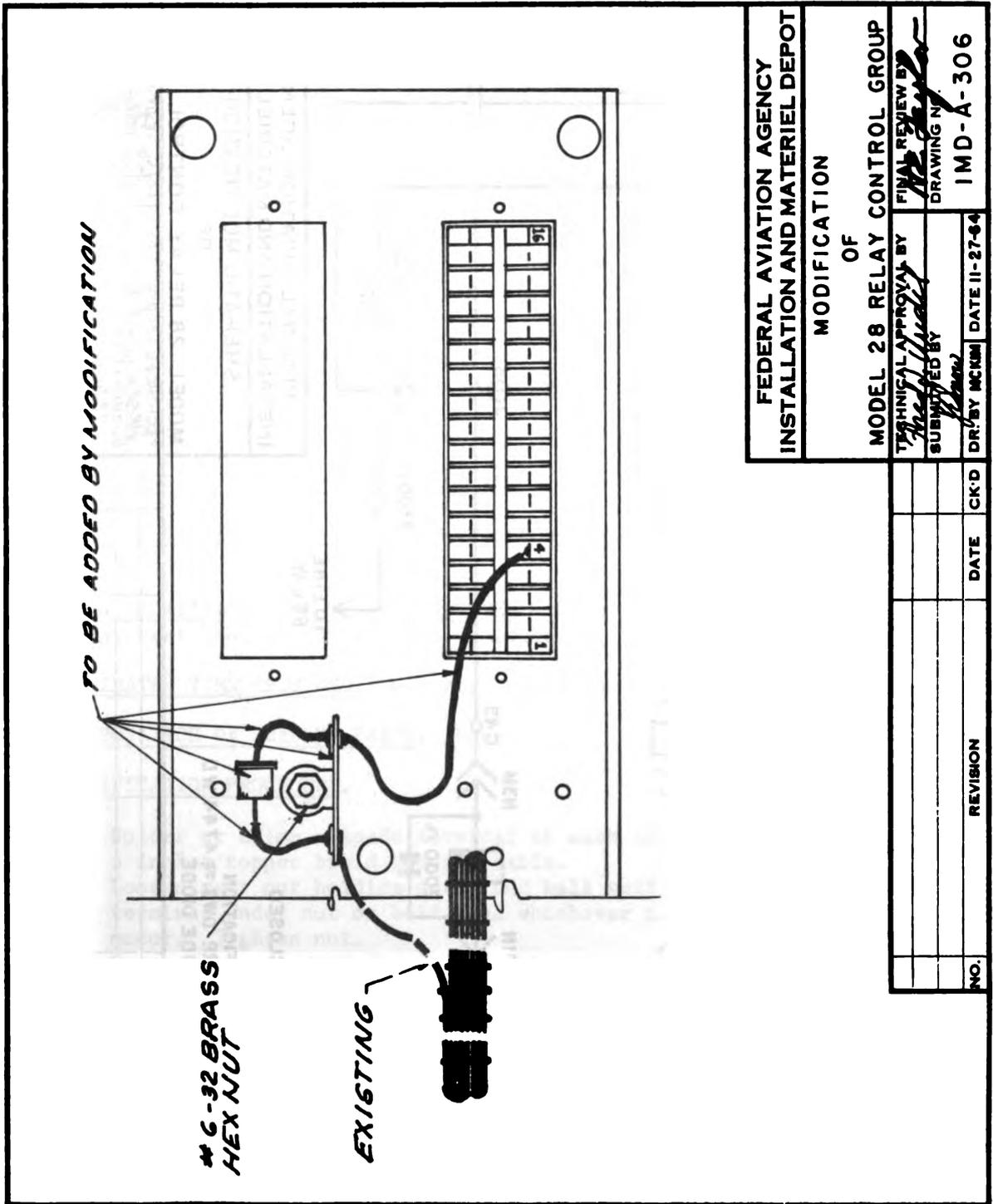
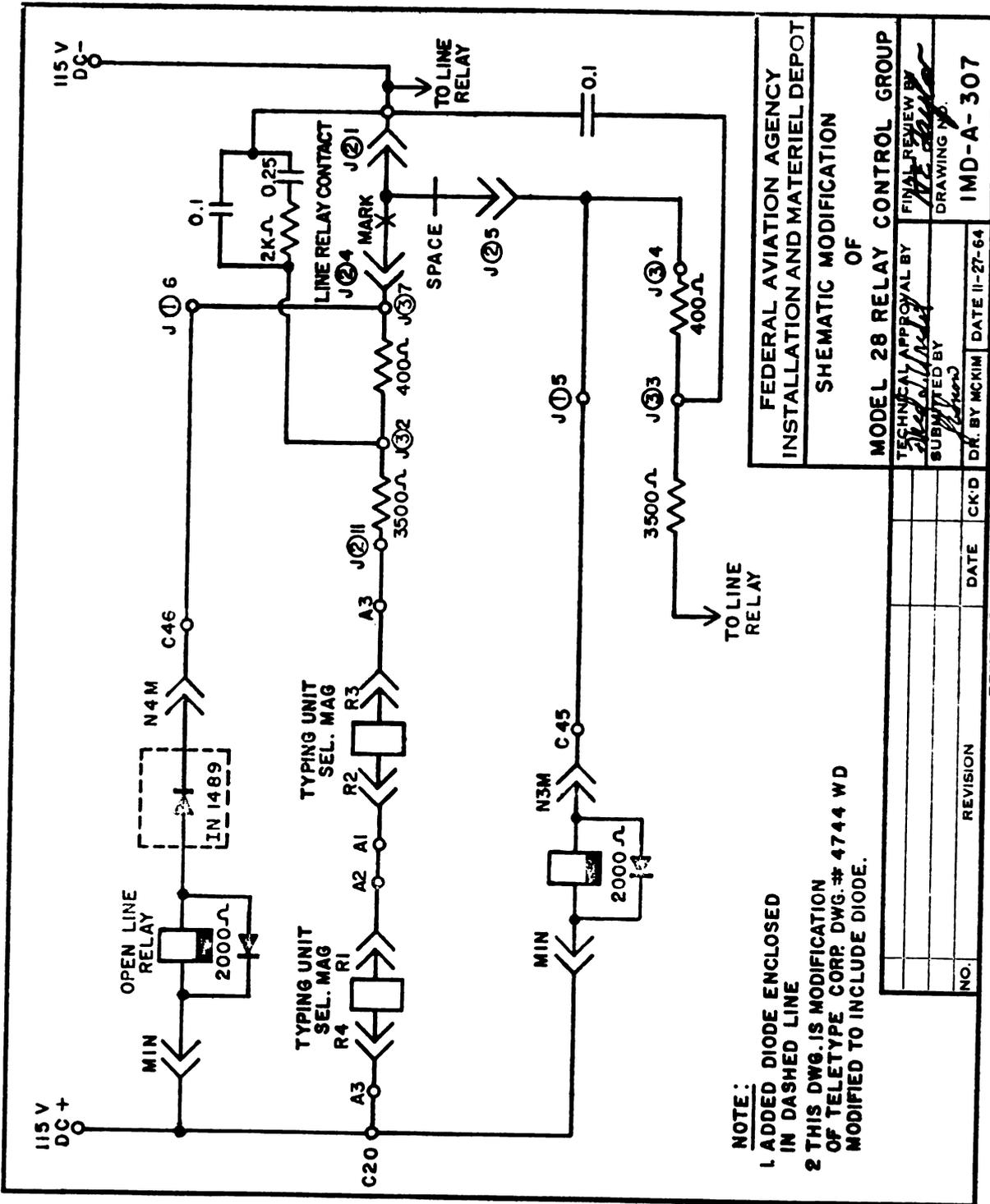


FIGURE 1



FEDERAL AVIATION AGENCY
INSTALLATION AND MATERIEL DEPT

SHEMATIC MODIFICATION
OF
MODEL 28 RELAY CONTROL GROUP

TECHNICAL APPROVAL BY: [Signature]
 SUBMITTED BY: [Signature]
 DATE: 11-27-64
 DRAWING NO.: IMD-A-307

| NO. | REVISION | DATE | CK'D | DATE II-27-64 |
|-----|----------|------|------|---------------|
| | | | | |
| | | | | |
| | | | | |

FIGURE 2

CHAPTER 79. TELETYPEWRITER EQUIPMENT
SYNCHRONOUS DRIVE MOTORS

1. OBJECT. To eliminate a possible electrical shock hazard.
2. REASON FOR MODIFICATION. To provide increased safety to personnel.
3. APPLICATION. This modification shall be made to all synchronous drive motors used on teletypewriter equipment (M-28 RO-ASR etc.).
4. REFERENCES. Teletype Corporation technical manuals for the equipment involved.
5. MATERIALS REQUIRED.
 - a. Two each spade terminals
 - b. Five inches of 3/16" or 1/2" copper braid shielding or bonding cable.
6. SOURCE OF MATERIALS. Local stock or local purchase.
7. TOOLS AND/OR TEST EQUIPMENT REQUIRED. Miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. Maintenance technicians or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of this notice or at next routine maintenance schedule.
10. ESTIMATED TIME REQUIRED. One hour per motor unit.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE.
 - a. Solder or crimp a spade terminal to each end of approximately 5 inches copper braid bonding cable.
 - b. Loosen rear nut holding motor end bell sufficiently to put spade terminal under nut or bolt head whichever is at the gear end of motor. Tighten nut.
 - c. Secure other end of copper braid bonding cable by putting spade terminal attached, under nearest motor base mounting screw.

NOTE: In some installations it may be more convenient to ground motor at the fan end. If so, care must be exercised to dress ground strap away from the fan.

13. TESTS AFTER MODIFICATION.

- a. Check to see that the ground strap is clear and will remain clear of gears or fan.
- b. Measure resistance from motor frame to base. The resistance should be zero ohms.

14. USE. On all teletypewriter equipment synchronous drive motors including test bench arrangements.

15. RESULT OF MODIFICATION. The synchronous drive motors will be grounded eliminating a possible electrical shock hazard which could occur if the motor windings or leads become shorted to the motor frame.

16. CORRECTIONS TO DRAWINGS. None.

17. CORRECTIONS TO INSTRUCTIONS. None.

18. CORRECTIONS TO RECORDED DATA. None (Note that modification has been made).

CHAPTER 80. MODIFICATION - TELETYPEWRITER
MODEL 28 FAA STANDARD CONFIGURATION

1. OBJECT. To modify existing receive only (RO) and send receive (KSR) teletypewriter printer electrical configurations to conform to the FAA Standard configurations.
2. REASON FOR MODIFICATION. To have standard RO and KSR teletypewriter printer configurations within the Federal Aviation Agency.
3. APPLICATION. This modification shall be accomplished on all RO and KSR teletypewriter units that do not conform to the FAA Standard configurations.
4. REFERENCES.
 - a. Teletype Corporation Specification 5820S, Issue 3, dated April 1959.
 - b. Teletype Corporation Specification 50152S, Issue 1, dated June 1963.
 - c. Attachments, Figures 1, 2, 3, and 4, supplied.
 - d. FAA Standard Drawing No. IMD-D-361, supplied.
5. MATERIALS REQUIRED.
 - a. For the VSL printer configurations no material is required other than jumper wires. These shall be withdrawn from station stock.
 - b. For the old type printers the following material will be required:
 - (1) Washer, lock, #6, T. T. #2191,
FSN 5310-194-1007 3 ea.
 - (2) Nut, 6-40, Hex, T. T. #3598,
FSN 5310-208-8716 1 ea.
 - (3) Washer, Flat, #6, T. T. #7002,
FSN 5310-193-7591 1 ea.
 - (4) Spring, T. T. #86835, FSN 5815-448-1819 1 ea.

- | | |
|---|-------|
| (5) Washer, Lock, #4, T. T. #107116, FSN 5815-370-1194 | 1 ea. |
| (6) Screw, 6-40x 7/16, T. T. #151618, FSN 5305-208-6434 | 1 ea. |
| (7) Screw, 4-40 x 1/4, T. T. #151637, FSN 5305-638-3853 | 1 ea. |
| (8) Screw, 6-40 x 5/16, T. T. #151658, FSN 5305-208-6531 | 2 ea. |
| (9) Latch, T. T. #152462, FSN 5815-370-1835 | 1 ea. |
| (10) Latch, T. T. #152463, FSN 5815-370-1836 | 1 ea. |
| (11) Bracket, T. T. #154872, FSN 5815-701-5013 | 1 ea. |
| (12) Bracket, T. T. #157151, FSN 5815-679-9864 | 1 ea. |
| (13) Connector, T. T. #152466, FSN 5935-201-3307 | 1 ea. |
| (14) Connector, T. T. #152467, FSN 5935-201-8209 | 1 ea. |
| (15) Wire, #24 stranded, polyethylene insulation | 5 ft. |

6. SOURCE OF MATERIAL. Modification kits which include all the material listed in 5b are to be requisitioned from Supply Management Division (SMD) IM-980, beginning August 1, 1965, using Federal Stock Number (FSN) 0000-004-3900.
7. TOOLS REQUIRED. Standard station miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. As programed by the regions.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the regions, but no later than January 1, 1968.
10. ESTIMATED TIME REQUIRED.
- a. VSL configuration - 2 man-hours per unit.
 - b. Older configuration - 4 man-hours per unit.

11. DISPOSITION OF SURPLUS PARTS. None.

12. MODIFICATION PROCEDURE.

a. VSL configuration.

- (1) Remove typing unit from cabinet.
- (2) Remove the cable between the auxiliary typing unit connector (X connector) and the auxiliary "C" block (block having terminals 61 through 80). Remove the female cable connector (152466) from the cable. Clean the connector for reuse in step (11) below.
- (3) Remove wire from the X connector (152467) on the typing unit.
- (4) The X connector will be referred to as the Y connector after removal of the above cable. It is also referred to as the Y connector in FAA Standard drawings.
- (5) Selector magnet and stunt solenoid wires will remain on the R chassis connector as presently wired. It is not necessary to move these. Remove all other external connections on the Y and R connectors.
- (6) Remove mounting hardware from the Y and R connectors and remount on the 157151 bracket. Mount the Y connector to the left (inner) side with the keyhole to the front of the typing unit. Mount the R connector to the right (outer) side with the keyhole to the rear of the typing unit. The R connector is the one to which the selector magnet and off-line stunt shift solenoid are connected.
- (7) Refer to Figure 3. Turn typing unit over and jumper the following connections:

| | | |
|------|----|------|
| Y-2 | to | R-2 |
| Y-5 | to | R-5 |
| Y-7 | to | R-7 |
| Y-8 | to | R-8 |
| Y-15 | to | R-15 |
| Y-16 | to | R-16 |

| | | |
|------|----|------|
| Y-18 | to | R-18 |
| Y-19 | to | R-19 |
| R-10 | to | R-12 |
| R-11 | to | R-13 |
| R-14 | to | R-17 |

- (8) Unsolder the following wires from stunt box contacts and remove wires from cable:

W-P wire from BB-9 (slot 23 normally open contact)

W-P wire from BB-10 (slot 23 transfer arm)

W-BK wire from BB-12 (slot 26 transfer arm)

- (9) Jumper a wire between contacts BB-8 and BB-10 (transfer arm of slot 20 to transfer arm of slot 23).
- (10) Jumper a wire between contacts BB-7 and BB-9 (normally open contact of slot 20 to normally open contact of slot 23.)
- (11) Jumper a wire between the normally open contact of slot 23 and the normally open contact of slot 32.
- (12) Jumper a wire between the normally open contact of slot 32 and the normally open contact of slot 38.
- (13) Jumper a wire between the transfer arm of slot 23 and the transfer arm of slot 32.
- (14) Jumper a wire between the transfer arm of slot 32 and the transfer arm of slot 38.
- (15) Refer to Figures 1 and 2. Connect the following wires to the female cable connector (152466) removed in (2) above:

| | | |
|------|----|------|
| W-BR | to | Y-2 |
| W-R | to | Y-5 |
| S | to | Y-7 |
| BR | to | Y-15 |
| BL | to | Y-16 |
| P | to | Y-18 |
| Y | to | Y-19 |

Tape extra leads back to cable.

- (16) Remove wire SC-8 (W-X-Y) from terminal C-62.
- (17) Remove wire SC-7 (W-Y-BL) from terminal C-66.
- (18) Pull two wires disconnected in steps (16) and (17) out of service cable for a distance of two feet from the "C" block.
- (19) Reroute these two wires to "C" block in top of cabinet having terminals 21 through 40.
- (20) Connect wire SC-8 (W-Y-Y) to C-28.
- (21) Connect wire SC-7 (W-Y-BL) to C-26.
- (22) Remove the following jumpers on the "C" blocks:

| | | |
|------|----|------|
| C-41 | to | C-65 |
| C-43 | to | C-52 |
- (23) Jumper the following connections on the "C" blocks:

| | | |
|------|----|------|
| C-25 | to | C-32 |
| C-27 | to | C-43 |
- (24) Remove the purple wire from C-32 that comes from R-5 and splice to C-63.
- (25) Replace typing unit in cabinet.

b. Old printer configuration. (all regions)

- (1) Inspect the transmitter control device to ascertain that it has been updated to the #179472. If updating is required update in accordance with Teletype Corporation Specification 501528, Issue 1, dated June 1963, or obtain a #179472 by E&R requisition of FSN 5815-960-6530 from the Installation and Materiel Depot, Oklahoma City, Oklahoma.
- (2) Remove typing unit from cabinet.

- (3) Remove each stunt box connecting wire from the old #152467 connector. Do not remove selector magnet and shift solenoid wiring from the #152467 connector.
- (4) Mount the #157151 bracket to the side frame in place of the #152461 bracket.
- (5) Mount the new #152467 Y connector to the left (inner) side with the keyhole to the front of the typing unit.
- (6) Mount the old #152467 R connector to the right (outer) side with the keyhole to the rear of the typing unit. This is the connector to which the selector magnet and off-line stunt shift solenoid are connected.
- (7) Refer to Figure 3. Turn typing unit over and jumper the following connections:

| | | |
|------|----|------|
| Y-2 | to | R-2 |
| Y-5 | to | R-5 |
| Y-7 | to | R-7 |
| Y-8 | to | R-8 |
| Y-15 | to | R-15 |
| Y-16 | to | R-16 |
| Y-18 | to | R-18 |
| Y-19 | to | R-19 |
| R-10 | to | R-12 |
| R-11 | to | R-13 |
| R-14 | to | R-17 |

- (8) Connect wires from the stunt box to the #152466 Y cable connector furnished. Wire in accordance with Figures 1 and 2. Do not thread wiring through frame of typing unit.
- (9) Upon completion the #152466 Y cable connector from the stunt box will connect to the inner #152467 Y connector and the cabinet cable connector will connect to the outer R Connector.
- (10) In regions where the VSL series service cable and plug have not been previously installed they should be installed concurrently with this modification. All wiring from the service cable should conform to Figure 4.

(11) Remove any jumpers or wiring that do not conform to the FAA Standard drawings and correct to those standards, unless regional approval for an exception is obtained.

c. The changes below will be different for each region. Each region will follow its respective procedures.

(1) Southwest and Southern Regions.

(a) Move purple wire from C-57 to C-63 that comes from R-5.

(b) Remove the following jumpers on the "C" blocks:

| | | |
|------|----|------|
| C-9 | to | C-13 |
| C-40 | to | C-54 |
| C-43 | to | C-61 |
| C-44 | to | C-52 |
| C-59 | to | C-78 |

(c) Jumper the following connections on the "C" blocks:

| | | |
|------|----|------|
| C-10 | to | C-13 |
| C-43 | to | C-69 |
| C-51 | to | C-57 |

(d) Connect wire to C-32 coming from M-2, if it has been disconnected.

(2) Eastern Region.

(a) Move purple wire from C-57 to C-63 that comes from R-5.

(b) Remove the following jumpers on the "C" blocks:

| | | |
|------|----|------|
| C-9 | to | C-13 |
| C-43 | to | C-61 |

(c) Jumper the following connections on the "C" blocks:

| | | |
|------|----|------|
| C-10 | to | C-13 |
| C-43 | to | C-69 |

(3) Central Region.

(a) Move wire from C-57 to C-63 that comes from R-5.

(b) Remove the following jumpers on the "C" blocks:

| | | |
|------|----|------|
| C-9 | to | C-13 |
| C-25 | to | C-50 |
| C-41 | to | C-50 |

(c) Jumper the following connections on the "C" blocks:

| | | |
|------|----|------|
| C-10 | to | C-13 |
| C-25 | to | C-32 |
| C-32 | to | C-41 |
| C-43 | to | C-69 |

(d) Remove wire (W-BL) from C-65 that comes from R-8 and connect to C-33.

(4) Western Region.

(a) Remove purple wire from C-32 that comes from R-5 and splice to C-63.

(b) Remove from C-51 purple wire that comes from D-1 and white wire that comes from M-2, and connect to C-32.

(c) Remove the 48 volt service cable.

(d) Remove the following jumpers on the "C" blocks:

| | | |
|------|----|------|
| C-11 | to | C-13 |
| C-27 | to | C-41 |
| C-28 | to | C-43 |
| C-32 | to | C-57 |
| C-41 | to | C-50 |
| C-50 | to | C-52 |

(e) Jumper the following connections to the "C" blocks:

| | | |
|------|----|------|
| C-10 | to | C-13 |
| C-25 | to | C-32 |
| C-27 | to | C-43 |
| C-32 | to | C-41 |
| C-43 | to | C-69 |
| C-51 | to | C-57 |

13. TEST AFTER MODIFICATION.

- a. Make a visual inspection of the work to determine general appearance and workmanship.
- b. Place printer on test circuit and determine that all functions of the printer operate properly.

14. USE. On all teletypewriter RO and KSR printers which have not been wired to conform to the FAA standard, or which are not to be exchanged with the Installation and Materiel Depot within a period specified by the region. Printers overhauled by the I&M Depot after February 1965 will already be modified to this standard.

15. RESULT OF MODIFICATION. The modification of the equipment in accordance with this directive will standardize all receive only (RO) and send receive (KSR) teletypewriter printers within the Federal Aviation Agency.

16. CORRECTIONS TO DRAWINGS. FAA Standard Model 28 teletypewriter drawings shall be used as the standard. Corrections will not be required for teletypewriter drawings.

17. CORRECTIONS TO INSTRUCTIONS. Correct associated instruction material as appropriate.

18. CORRECTIONS TO RECORDED DATA. None.

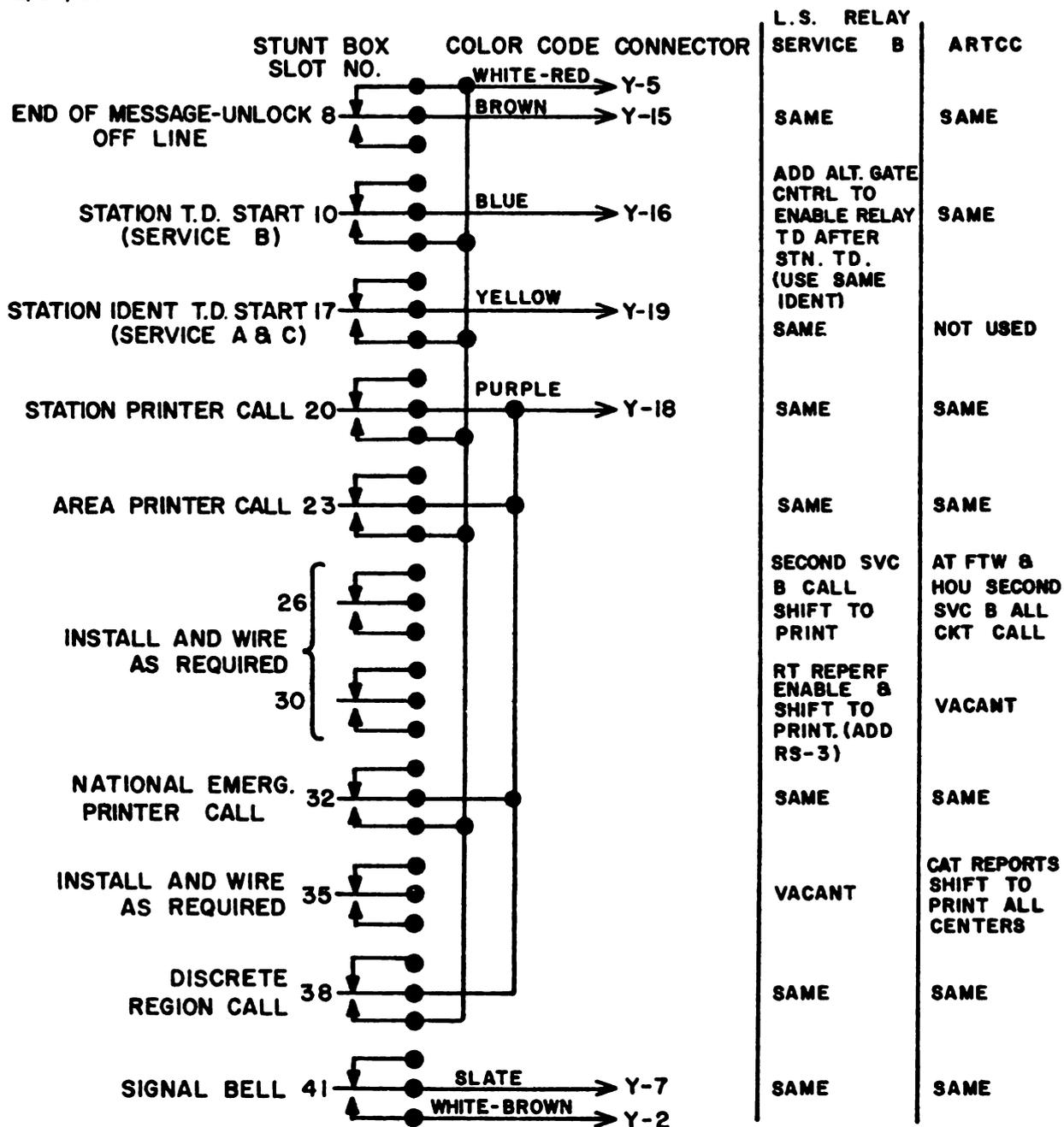
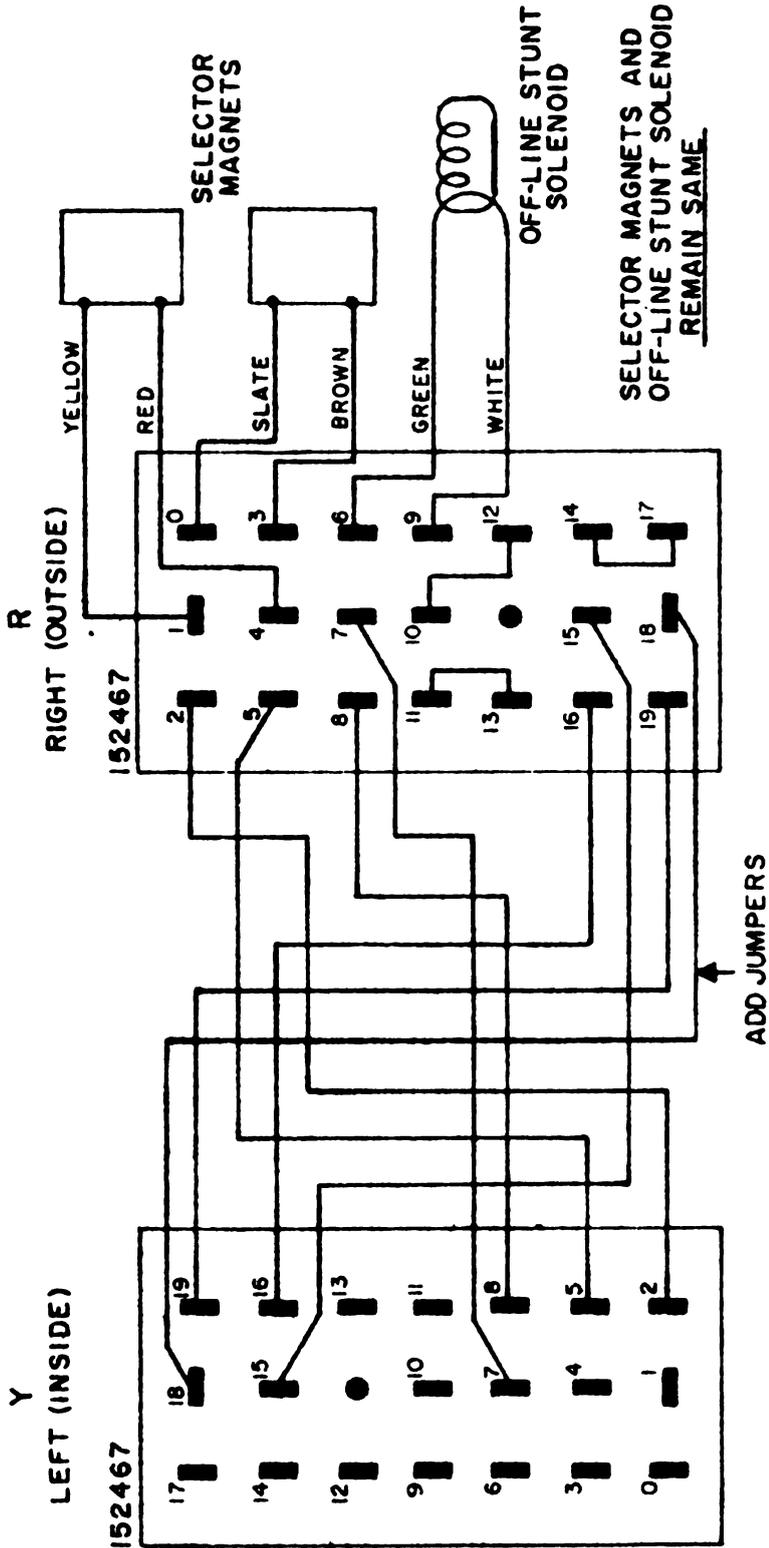


FIGURE 1
FAA STANDARD STUNT BOX WIRING



1. LEAVE SELECTOR MAGNET AND STUNT SOLENOID AS WIRED
2. STRAP TERMINALS 18 TO 18, 19 TO 19, 16 TO 16, 15 TO 15, 8 TO 8, 7 TO 7, 2 TO 2, 5 TO 5.

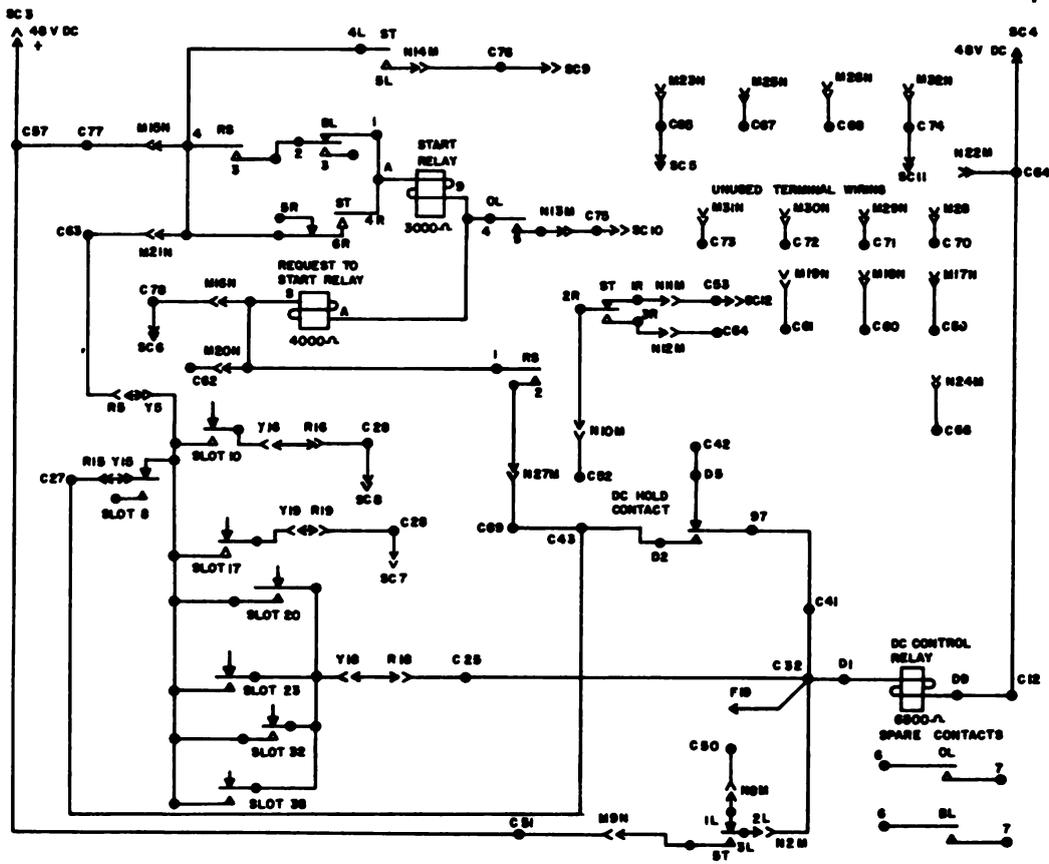
FIGURE 3. STRAPPING BETWEEN CONNECTORS ON TYPING UNIT.

| <u>Function</u> | <u>Color Code</u> | <u>Amphenol 26-4501-24S Terminal No.</u> | <u>Cabinet Terminal No.</u> |
|---------------------|-------------------|--|---------------------------------|
| Signal Line | W-R-BR | 1 | C-5 |
| Signal Line | W-R-R | 2 | C-15 |
| +48 V. D.C. | W-R-O | 3 | C-57 |
| -48 V. D.C. | W-R-Y | 4 | C-64 |
| Off Line (FCM) | W-R-G | 5 | C-65 |
| Man. Req. for start | W-R-BL | 6 | C-78 |
| 3 letter TD start | W-Y-BL | 7 | C-26 |
| 2 letter TD start | W-Y-Y | 8 | C-28 |
| TD Clutch | W-BR-G | 9 | C-76 |
| TD stop | W-BR-Y | 10 | C-75 |
| Spare | W-BR-B | 11 | C-74 |
| Spare | W-BR-ER | 12 | C-53 |
| Spare | W-R | 13 | Spare |
| Spare | W | 14 | Spare |
| Spare | W-Y | 15 | Spare |
| Spare | W-R-BK | 16 | Spare |
| Spare | W-BR-O | 17 | Spare |
| Spare | W-Y-B | 18 | Spare |
| Spare | W-Y-O | 19 | Spare |
| Spare | W-Y-BR | 20 | Spare |
| Spare | W-BR-BK | 21 | Spare |
| Spare | W-BR | 22 | Spare |
| Spare | W-Y-BK | 23 | Spare |
| Spare | W-Y-G | 24 | Spare |

FIGURE 4. FAA STANDARD SERVICE (COVERCL)
CABLE WIRING

TRANSMITTER DISTRIBUTOR CONTROL CIRCUIT

6170.1
1/14/69



- LEGEND**
- Selector Magnet Terminal Block (LSM)
 - Line Test Key Terminals
 - Cabinet Terminals
 - D.C. Control Relay Block Terminals
 - Power Block Terminals (LSM)
 - Keyboard Connector
 - ① - Line Relay Terminal Strip
 - ② - Line Relay Terminal
 - ③ - Line Relay Filter Terminals
 - Rectifier (150 ma) Terminals
 - (20) (Relay) Control Device (Connector-Plug Terminals (RSM - RSM))
 - AC Receptacle & Fuse
 - AC Power Switch
 - Typing Unit
 - Start Bus Connector

- NOTES**
1. All apparatus is shown in unoperated or de-energized position.
 2. Circuits shown for .060 amp. neutral signal line operation - for .020 amp. line current, add dashed (---) connections and omit connections marked (⊖).
 3. Unit wired for 115V 60 cps (± 1%) AC power input. Control circuit wired for 48V DC input.
 4. Spare lead from F15 is reserved for polar operation of signal generator.
 5. Line Break Key is shown disabled with strap C10 - C11. To enable the break key, remove C10 - C11 strap.
 6. This strap in receiving-only base connector.
 7. Signal Generator as shown when keyboard is used.

- Normally open contact or switch
- Normally closed contact or switch
- Relay, Solenoid or Magnet
- Relay - Two Coil Polar
- Relay - Slow Release

START BUS CONTACTS

| Slot | Function (Circuit) |
|----------------|--------------------|
| 8 | Shunt |
| 10, 17 | 20 Start |
| 20, 21, 22, 23 | Print Off Line |
| 31 | Signal Bell |

- C - Service (Control) Cable
- F - Start Relay Contacts
- R - Request-to-Start Relay Contacts
- S - Open Line Relay Contacts
- L - Busy Line Relay Contacts

| NO. | REVISION | DATE | BY |
|-----|---|---------|----|
| 7 | REMOVED NOTE 6. CHANGED SLOT 36 TO 32. ADDED SLOT 38. | 7-30-68 | W |
| 6 | ADDED "SSM" TO TITLE | 6-2-68 | W |
| 5 | CHANGE TERMINAL POINTS | 6-14-68 | W |
| 4 | ADDED NOTE 6 | 3-22-68 | W |
| 3 | INTERCHANGED F15 & F16 | 3-10-68 | W |
| 2 | CONNECTED 11, 5 TO 3. ADDED JOBBAY TERMINAL STRIPPED 0.15" CAPACITOR TO J10. ADDED SHIELD TYPE & CAPACITOR VALUE. MODIFIED LEGEND REGARDING SR & P RELAYS | 4-6-68 | W |
| 1 | | 2-24-68 | W |

**FEDERAL AVIATION AGENCY
INSTALLATION AND MATERIEL DEPOT**

**FAA STANDARD
MODEL 28 RO & K9R TELETYPEWRITER
WIRING DIAGRAM**

| | |
|--|--|
| TECHNICAL APPROVAL BY: <i>Walden K. Reichel</i> | FINAL REVIEW BY: <i>Ray G. Taylor</i> |
| SUBMITTED BY: <i>Walden K. Reichel</i> | DRAWING NO. IMD-D-361 |
| DRAWN BY: Clyde Methay | DATE: 2-8-68 |

CHAPTER 81. MODIFICATION - TELETYPEWRITER
MODEL 28(20) ASR TRANSMITTER
DISTRIBUTORS

1. OBJECT. To install insulating tubing on M-28 ASR Transmitter Distributor 115 AC terminals.
2. REASON FOR MODIFICATION. This modification reduces the shock hazard encountered when the cover is removed.
3. APPLICATION. This modification shall be made to all Model 28 ASR Transmitter Distributors.
4. REFERENCES. None.
5. MATERIALS REQUIRED. A short piece of plastic insulating tubing.
6. SOURCE OF MATERIAL. Station stock.
7. TOOLS OR TEST EQUIPMENT REQUIRED. Standard station miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. Field maintenance personnel or as determined by Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the Region.
10. ESTIMATED TIME REQUIRED. One half man-hour.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE.
 - a. With cover removed, place a short piece of heavy tubing (spaghetti) over the bare wire jumper from terminals 6 to 7 on the 14 terminal "G" connector located on the rear of the transmitter distributor. Arrange the tubing to cover terminals 6 and 7. CAUTION: 115V AC is present on these terminals.
 - b. Insure that the transmitter distributor cover cannot contact terminals 6 and 7 during removal or replacement of the cover.

13. TEST AFTER MODIFICATION. None.
14. USE. All M28 ASR transmitter distributors.
15. RESULTS OF MODIFICATION. The shock hazard due to the exposed 115V AC terminals now encountered with removal of the cover will be eliminated.
16. CORRECTIONS TO DRAWINGS. None.
17. CORRECTIONS TO INSTRUCTIONS. None.
18. CORRECTIONS TO RECORDED DATA. None.

CHAPTER 82. BDIS SEA H/L - MODULE LOW SPEED
LETTERS DELETE MODIFICATION

1. OBJECT. To provide a means of reading consecutive letters characters, in excess of ten off-line.
2. REASON FOR MODIFICATION. To conserve Low Speed circuit time.
3. APPLICATION. This modification shall be made on all SEA H/L modules at BDIS Interchange Centers.
4. REFERENCES. Teletype Corporation Bulletin 50115S, SEA H/L drawings 5550WD, 5551WD and attached drawing of wiring changes.
5. MATERIALS REQUIRED.
 - a. One AK-4 relay, Teletype Part No. 171501.
 - b. One relay bracket, Teletype Part No. 170516.
 - c. Two 470 ohm resistors.
 - d. One 25 mfd. condenser.
 - e. Three 50 mfd. condensers.
 - f. One terminal board to be fabricated from a blank terminal board, EC card or other suitable material.
 - g. Ten feet of hook-up wire.
6. SOURCE OF MATERIAL. Station stock, local purchase or order from OMD.
7. TOOLS REQUIRED. Miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. BDIS Interchange Center technicians or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of this modification.
10. ESTIMATED TIME REQUIRED. Eight man-hours. (including fabrication of terminal board)
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE. Make connections to relay by means of wire wrap tool or solder.

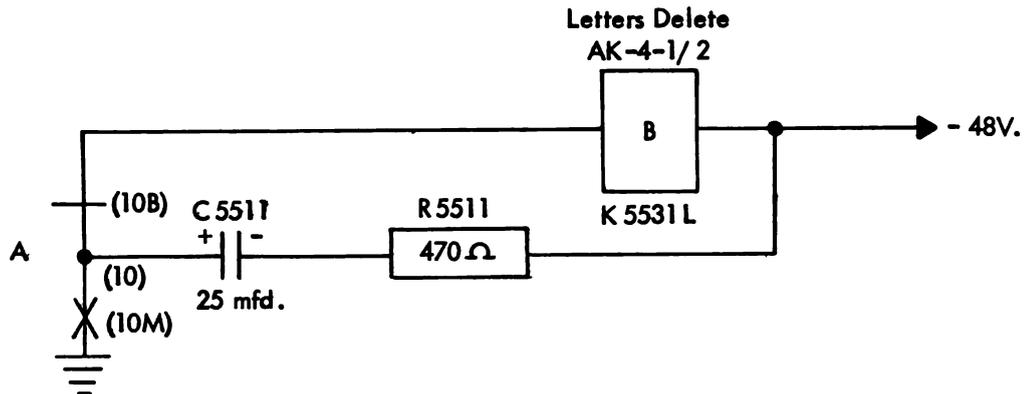
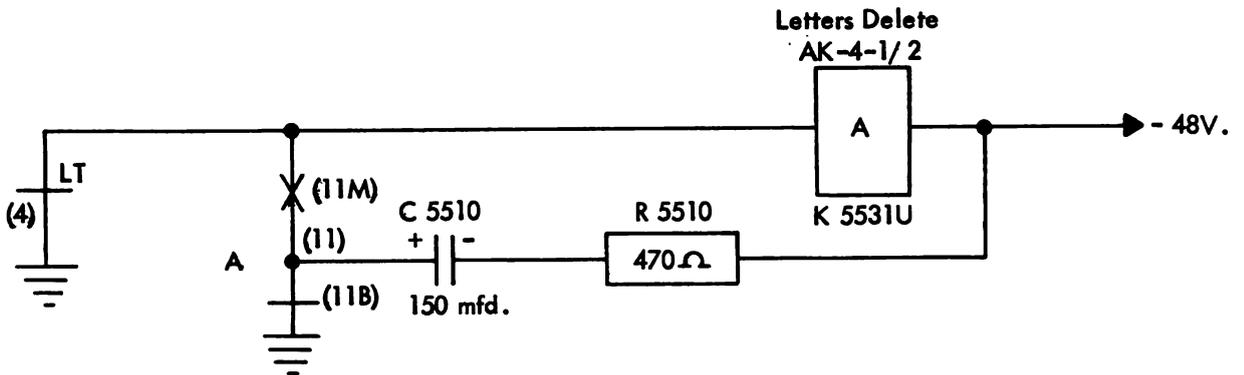
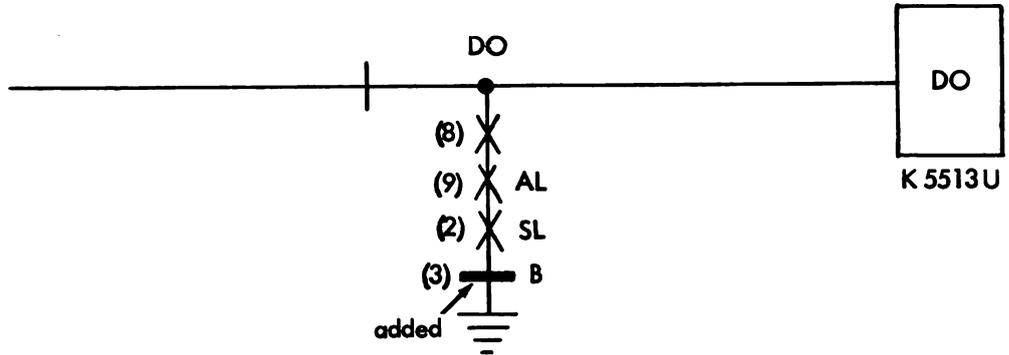
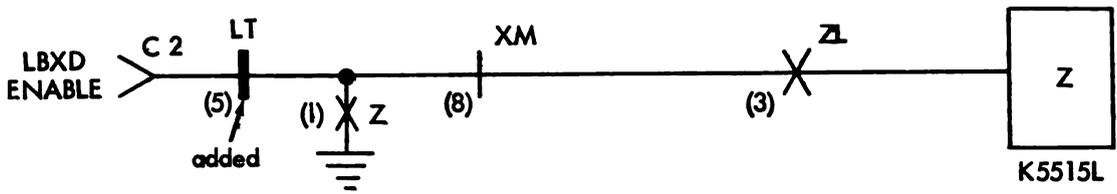
- a. Mount relay bracket 170516 and relay 171501 in position 31.
 - b. Mark position K5531.
 - c. Remove lead to J5501, terminal C-2 (LBXD enable) from 1M of K5515L (Z relay.) Extend this lead and connect to one side of unused set of break contacts (5) of Letters Sensing Relay K5511L.
 - d. Connect lead from other side of break contact 5B to 1M of K5515L (Z relay.) This will place a break contact of the Letters Sensing relay between the LBXD enable circuit C2 and the holding contact 1 of the Z relay.
 - e. Connect a lead from another unused set of break contacts (4) of K5511L to ground.
 - f. Connect a lead from 4B K5511L to 1U of added relay K5531U.
 - g. Mount the RC network components on blank or fabricated terminal board and install in position 26 or 33, whichever provides adequate space and/or is more convenient. Label accordingly TB5526 or TB5533.
 - h. Remove ground lead from (SL) K5509L relay contact 2M in D0 relay hold circuit. If more than one lead on terminal 2M, solder together and tape so that ground to other circuits will be complete.
 - i. Connect lead SL relay contact 2M to added relay 5531L contact 3.
 - j. Connect relay 5531L contact 3B to ground.
 - k. Connect 2U and 2L of relay K5531 to -48 volts, terminal A7.
 - l. Connect R5510 470 ohm resistor to K5531U terminal 2U.
 - m. Connect R5511 470 ohm resistor to K5531L, terminal 2L.
 - n. Connect C5510 to K5531U, contact 11.
 - o. Connect K5531U contact 11B to ground and contact 11M to 1U.
 - p. Connect C5511 to K5531U, contact 10.
 - q. Connect K5531U contact 10M to ground and contact 10B to 1L of K5531L.
13. TESTS AFTER MODIFICATION. Using the test circuit and a test tape containing suitably addressed messages and several letters feed out sequences:
- a. Observe the operation of the distributor. The distributor should stop after eight to ten letters characters have been sensed.
 - b. If more than ten or less than eight letters characters stops the distributor, change the value of R5510 to a value which will provide distributor drop out at eight to ten characters. A higher value will feedout more characters before dropping K5531U and a lower value will drop out K5531U with the feedout of fewer characters.
14. USE. At all BDIS Interchange Centers.

15. RESULTS OF MODIFICATION. Added relay "A" K5531U will be operated and remain operated on non-letters characters. The Letters Sensing Relay K5511L pulses on letters characters, opening the ground to K5531U through contact 4B. The time constant network will hold relay K5531U operating until approximately ten letters characters have sensed after which time it will drop out. Relay "B" K5531L is normally deenergized, its time constant network is charged through the make contact 10 of K5531U. When this contact opens, relay "B" K5531L is pulsed, opening its contact 3B which breaks the holding circuit of the Distributor Operate Relay K5513U, stopping the distributor. The remaining letters characters are read "off-line."

In normal operation, if an "off-line" letters feedout is in progress and an LBXD enable (QS call from APULS) is sensed, the remaining letters characters are read "on-line." With this modification, contact 5 of Letters Sensing relay K5511L, will open on letters character, preventing an LBXD enable and all letters will be read "off-line." Any message following the letters feed out will be delayed until the "off-line" feedout is completed and another QS call is sensed. It would appear that with this arrangement, only one message would be transmitted following an LBXD enable, which is the case if a message is followed by a letters feedout. However, when a message is delayed, as indicated above, this message will eliminate a letters feedout, if another message is received before the next LBXD enable. Therefore, more than one message, can be transmitted at the next LBXD enable, as there will not be a letters feedout separating the messages.

It must be noted, and ATC personnel so advised, that when an error is made in preparing a message, they cannot back space and letter out the error except as indicated in par. 142.1 of Handbook AT P 73001A. If for instance, eight to ten characters are lettered out, the transmission is stopped because of this modification and the balance of the message will be lost.

16. CORRECTIONS TO DRAWINGS. Attach the enclosed drawing to 5550WD, or mark 5550WD accordingly.
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.
18. CORRECTIONS TO RECORDED DATA. None. (Note that modification has been made.)



BDIS SEA H/L - LETTERS DELETE MODIFICATION

CHAPTER 83. BDIS(5) SEDET MODULE, HIGH SPEED
DRPE INHIBIT MODIFICATION

1. OBJECT. To prevent a DRPE enable when an ICAO end of line code is followed by a recognized alpha or numeric select code.
2. REASON FOR MODIFICATION. To prevent the relay of partial messages to the area circuits.
3. APPLICATION. This modification shall be accomplished on all BDIS Interchange Center, High Speed, Sedet Modules.
4. REFERENCES.
 - a. Teletype Corporation Specification 50115S.
 - b. 5523WD Schematic Diagram for Sequence Detector. (SEDET)
 - c. 5524WD Actual Wiring Diagram for Sequence Detector. (SEDET)
5. MATERIALS REQUIRED. None.
6. SOURCE OF MATERIAL. None required.
7. TOOLS AND/OR TEST EQUIPMENT REQUIRED. Miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. BDIS I/C Maintenance technicians or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of this Notice.
10. ESTIMATED TIME REQUIRED. One man-hour.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE.
 - a. Locate EC card connector, position Z2309. (Reference 5524WD, Item H.)
 - b. Remove jumper lead from terminal "C" to "J".

13. TESTS AFTER MODIFICATION.
 - a. Prepare a test tape CRGR Line Feed XXX Text EOM. (XXX = programmed Alpha or numeric select code.)
 - b. Using the test circuit, the associated DRPE should be inhibited (not enabled) by the above sequence.
14. USE. At all BDIS Interchange Stations.
15. RESULT OF MODIFICATION. Will eliminate the occasional low speed readout that occurs whenever an ICAO end of line code is followed by three characters corresponding to a valid select code.
16. CORRECTIONS TO DRAWINGS. Correct Teletype Corporation drawings 5523WD and 5524WD to show removal of lead "C" to "J", Z2309 with red pencilled X's or an undulating line.
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instruction material as appropriate.
18. CORRECTIONS TO RECORDED DATA. None. (Note that modification was made.)

CHAPTER 84. BDIS(6) CX MOTOR OPERATION
ONLY WHEN TRAFFIC IS AVAILABLE

1. OBJECT. To provide CX motor shut down when there is no traffic available.
2. REASON FOR MODIFICATION. To reduce wear and heat resulting from the CX motor running continuously.
3. APPLICATION. This modification shall be accomplished on the main and standby CXCO and MOSIR Modules at all BDIS Interchange Centers.
4. REFERENCES. Teletype Specification 50115S.
 - a. CXCO Module, drawings 5503WD and 5504WD.
 - b. MOSIR Module, drawings 5513WD and 5514WD.
5. MATERIALS REQUIRED. Ten feet AWG #24 stranded hookup wire, polyethylene insulation or equal.
6. SOURCE OF MATERIALS. Station stock or local purchase.
7. TOOLS REQUIRED. Miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. BDIS I/C Maintenance technicians or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of this Notice or during next routine maintenance schedule.
10. ESTIMATED TIME REQUIRED. Three man-hours.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE. Reference Teletype Corporation drawings 5503WD, 5504WD CXCO Module and drawings 5513WD, 5514WD MOSIR Module.
 - a. CXCO Module. From unused contacts 10 and 10M on Traffic Available relays K6711U, K6713U and K6715U, (if I/C Center has three area circuits) connect leads to J6701 terminals as follows: From K6711U to A1 and A2, K6713U to A3 and A4, K6715U to B1 and B2.

- b. Remove lead from terminal J8, TB1816, MOSLR and reroute through rack cabling to terminal A1, TB1810, CXCO.
- c. Remove lead from terminal J10, TB1816, MOSLR and reroute to terminal A3, TB1810, CXCO.
- d. If three area circuits in use at I/C station, remove lead from K8, TB1816, MOSLR and reroute to terminal B1, TB1810, CXCO.
Note: The removed leads have sufficient length to reach TB1810 terminals if carefully rerouted.
- e. Connect a new lead from A2, TB1810, CXCO to J8, TB1816 MOSLR.
- f. Connect a new lead from A4, TB1810, CXCO to J10, TB1816 MOSLR.
- g. If three area circuits in use at I/C stations, connect a new lead from B2, TB1810, CXCO to K8, TB1816, MOSLR.

The above action will place contacts of the Traffic Available Relays in series with CX Motor Operate contacts, relay K1512.

13. TESTS AFTER MODIFICATION. Using test circuits with TAM Module Test Mode switch in the "Local Test" position.
 - a. In the SEA L/H Module, set the CX Mode Switch to the "OFF" position. The CX motor should not operate.
 - b. Set the CX Mode Switch to the "ON" position, set message count as indicated on DIMCO Module to zero by manual switch on TAMACC Module. The CX motor should operate.
 - c. Set the CX Mode Switch to "AUTO" position, count up one or more messages with switch on TAMACC module. The CX motor should operate.
 - d. Reset message count to zero. The CX motor should turn off.
14. USE. At all BDIS Interchange Centers.
15. RESULT OF MODIFICATION. With the SEA L/H, CX Mode Switch in the "AUTO" position, the CX Motor will be turned on, when called, only if traffic for transmission to the high speed line is available and will be turned off when there is no traffic available.

16. CORRECTIONS TO DRAWINGS.

- a. 5503WD CXCO. In the space to the right of the Traffic Available relays, show contacts 10-10M and J6701 termination.
- b. 5504WD CXCO. Identify and show contacts 10-10M on "A" (K6715U), "B" (6713U), "C" (K6711U) and "L" (J6701).
- c. On associated cabinet wiring charts, show added contact termination and rerouting of leads.

17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.

18. CORRECTION TO RECORDED DATA. None. (Note that modification was made.)

January 28, 1966

**SUBJ: COMMUNICATIONS FACILITY AND EQUIPMENT MODIFICATION HANDBOOK
DATA HANDLING FACILITIES AND EQUIPMENT**

**CHAPTER 85. MODIFICATION - TELETYPEWRITER MODEL 28
FAA STANDARD**

1. PURPOSE. To modify existing automatic send receive (ASR) teletypewriter printer electrical configurations to conform to the FAA standard configuration.
2. CANCELLATIONS. None.
3. REFERENCES.
 - a. Teletype Corporation Specification 5820S, Issue 3, dated April 1959.
 - b. Teletype Corporation Specification 50152S, Issue 1, dated June 1963.
 - c. Attachments, Figures 1, 2, 3 and 4.
 - d. FAA standard Drawing No. IMD-D-439 and IMD-C-496 supplied.
4. REASON FOR MODIFICATION. To have a standard teletypewriter printer configuration within the Federal Aviation Agency.
5. APPLICATION. This modification shall be accomplished on all ASR teletypewriter units that do not conform to the FAA standard configuration.
6. MATERIALS REQUIRED.
 - a. For the VSL printer configurations no material is required other than jumper wires. These shall be withdrawn from station stock.
 - b. For the old type printers the following material will be required:
 - (1) Washer, lock, #6, T.T. #2191, FSN 5310-194-1007 3 ea.
 - (2) Nut, 6-40, Hex, T.T. #3598, FSN 5310-208-8716 1 ea.
 - (3) Washer, Flat, #6, T.T. #7002, FSN 5310-193-7591 1 ea.

Distribution: List W-1, Item No. 30
List F-1, Item No. 30

- | | | |
|------|---|-------|
| (4) | Spring, T. T. #86835, FSN 5815-448-1819 | 1 ea. |
| (5) | Washer, Lock, #4, T. T. #107116, FSN 5815-370-1194 | 1 ea. |
| (6) | Screw, 6-40 x 7/16, T. T. #151618, FSN 5305-208-6434 | 1 ea. |
| (7) | Screw, 4-40 x 1/4, T. T. #151637, FSN 5305-638-3853 | 1 ea. |
| (8) | Screw, 6-40 x 5/16, T. T. #1516538, FSN 5305-208-6431 | 2 ea. |
| (9) | Latch, T. T. #152462, FSN 5815-370-1835 | 1 ea. |
| (10) | Latch, T. T. #152463, FSN 5815-370-1836 | 1 ea. |
| (11) | Bracket, T. T. #154872, FSN 5815-701-5013 | 1 ea. |
| (12) | Bracket, T. T. #157151, FSN 5815-679-9864 | 1 ea. |
| (13) | Connector, T. T. #152466, FSN 5935-201-3307 | 1 ea. |
| (14) | Connector, T. T. #152467, FSN 5935-201-8209 | 1 ea. |
| (15) | Wire, #24 stranded, polyethylene insulation | 5 Ft. |

7. SOURCE OF MATERIAL. Modification kits which include all the material listed in 6b are to be requisitioned from Supply Management Branch (SMB), AC-480, now available from stock, using Federal Stock Number (FSN) 0000-004-3900.
8. TOOLS REQUIRED. Standard station miscellaneous hand tools.
9. WORK TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
10. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the regions.
11. ESTIMATED TIME REQUIRED.
- a. VSL configuration - 3 man-hours per unit.
 - b. Older configuration - 5 man-hours per unit.
12. MODIFICATION PROCEDURE.
- a. VSL configuration.
 - (1) Remove typing unit from cabinet.

- (2) Remove the cable between the auxiliary typing unit connector (X connector) and the auxiliary "C" block (block having terminals 61 through 80). Remove the female cable connector (152466) from the cable. Clean the connector for use in step (15) below.
- (3) Remove wires from the X connector (152467) on the typing unit.
- (4) The X connector will be referred to as the Y connector after removal of the above cable. It is also referred to as the Y connector in the FAA standard drawings.
- (5) Selector magnet and stunt solenoid wires will remain on the R chassis connector as presently wired. It is not necessary to move these. Remove all other external connections on the Y and R connectors.
- (6) Remove mounting hardware from the Y and R connectors and remount on the 157151 bracket. Mount the Y connector to the left (inner) side with the keyhole to the front of the typing unit. Mount the R connector to the right (outer) side with the keyhole to the rear of the typing unit. The R connector is the one to which the selector magnet and off-line stunt shift solenoid are connected.
- (7) Refer to Figure 3. Turn typing unit over and jumper the following connections:

| | | |
|------|----|------|
| Y-2 | to | R-2 |
| R-5 | to | R-5 |
| Y-7 | to | R-7 |
| Y-8 | to | R-8 |
| Y-15 | to | R-15 |
| Y-16 | to | R-16 |
| Y-18 | to | R-18 |
| Y-19 | to | R-19 |
| R-10 | to | R-12 |
| R-11 | to | R-13 |
| R-14 | to | R-17 |
- (8) Unsolder the following wires from stunt box contacts and remove wires from cable:
 - W-P wire from BB-9 (slot 23 normally open contact)
 - W-P wire from BB-10 (slot 23 transfer arm)
 - W-BK wire from BB-12 (slot 26 transfer arm)
- (9) Jumper a wire between contacts BB-8 and BB-10 (transfer arm of slot 20 to transfer arm of slot 23.)

- (10) Jumper a wire between contacts BB-7 and BB-9 (normally open contact of slot 20 to normally open contact of slot 23).
- (11) Jumper a wire between the normally open contact of slot 23 and the normally open contact of slot 32.
- (12) Jumper a wire between the normally open contact of slot 32 and the normally open contact of slot 38.
- (13) Jumper a wire between the transfer arm of slot 23 and the transfer arm of slot 32.
- (14) Jumper a wire between the transfer arm of slot 32 and the transfer arm of slot 38.
- (15) Refer to Figures 1 and 2. Connect the following wires removed in (2) above to the female cable connector (152466):

| | | |
|------|----|------|
| W-BR | to | Y-2 |
| W-R | to | Y-5 |
| S | to | Y-7 |
| BR | to | Y-15 |
| BL | to | Y-16 |
| P | to | Y-18 |
| Y | to | Y-19 |

Tape extra leads back to cable.

- (16) Remove wire SC1-8 (W-Y-Y) from terminal C-62.
- (17) Remove wire SC1-7 (W-Y-BL) from terminal C-66.
- (18) Pull two wires disconnected in steps (16) and (17) out of service cable for a distance of two feet from the "C" block.
- (19) Re-route these two wires to "C" block in top of cabinet having terminals 21 through 40.
- (20) Connect wire SC1-8 (W-Y-Y) to C-28.
- (21) Connect wire SC1-7 (W-Y-BL) to C-26.
- (22) Remove the following jumpers on the "C" blocks:

| | | |
|------|----|------|
| C-41 | to | C-65 |
| C-43 | to | C-52 |

(23) Jumper the following connections on the "C" blocks:

C-25 to C-32
C-27 to C-43

- (24) Remove the purple wire from C-32 that comes from R-5 and splice to C-63.
- (25) Replace typing unit in cabinet.
- (26) Refer to drawing IMD-C-496. Cabinet shall be modified in accordance with this drawing to allow for a standard duct access.

b. Old printer configuration (Non-VSL).

- (1) Inspect the transmitter control device to ascertain that it has been updated to the #179472. If updating is required, update in accordance with Teletype Corporation Specification 50152S, Issue 1, dated June 1963, or obtain a #179472 by F&R requisition of FSN 5815-960-6530 from the FAA Depot, Oklahoma City, Oklahoma.
- (2) Remove typing unit from cabinet.
- (3) Remove each stunt box connecting wire from the old #152467 connector. Do not remove selector magnet and shift solenoid wiring from the #152467 connector.
- (4) Mount the #157151 bracket to the side frame in place of the #152461 bracket.
- (5) Mount the new #152467 Y connector to the left (inner) side with the keyhole to the front of the typing unit.
- (6) Mount the old #152467 R connector to the right (outer) side with the keyhole to the rear of the typing unit. This is the connector to which the selector magnet and off-line stunt shift solenoid are connected.
- (7) Refer to Figure 3. Turn typing unit over and jumper the following connections:

Y-2 to R-2
Y-5 to R-5
Y-7 to R-7
Y-8 to R-8
Y-15 to R-15
Y-16 to R-16
Y-18 to R-18

Y-19 to R-19
R-10 to R-12
R-11 to R-13
R-14 to R-17

- (8) Connect wires from the stunt box to the #152466 Y cable connector furnished. Wire in accordance with Figures 1 and 2. Do not thread wiring through frame of typing unit.
 - (9) Upon completion the #152466 Y cable connector from the stunt box will connect to the inner #152467 Y connector and the cabinet cable connector will connect to the outer R connector.
 - (10) Refer to drawing IMD-C-496. Cabinet shall be modified in accordance with this drawing to allow for a standard duct access.
 - (11) In regions where the VSL series service control cables and plugs have not been previously installed, they should be installed concurrently with this modification. All wiring from the service cables should conform to Figure 4.
 - (12) Remove any jumpers or wiring that do not conform to the FAA standard drawings and correct to those standards, unless regional approval for an exception is obtained.
13. DISPOSITION OF SURPLUS MATERIAL. None.
14. TEST AFTER MODIFICATION.
- a. Make a visual inspection of the work to determine general appearance and workmanship.
 - b. Place printer on test circuit and determine that all functions of the printer operate properly.
15. USE. On all teletypewriter ASR printers which have not been wired to conform to the FAA Standard, or which are not to be exchanged with the FAA Depot within a period specified by the region.
16. RESULT OF MODIFICATION. This modification of the equipment in accordance with this directive will standardize all Automatic Send Receive (ASR) teletypewriter printers within the Federal Aviation Agency.

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17. CORRECTIONS TO INSTRUCTIONS. Correct associated instruction material as appropriate.
18. CORRECTIONS TO RECORDED DATA. None.

APPROVED JANUARY 28, 1966



6170.1
1/14/69

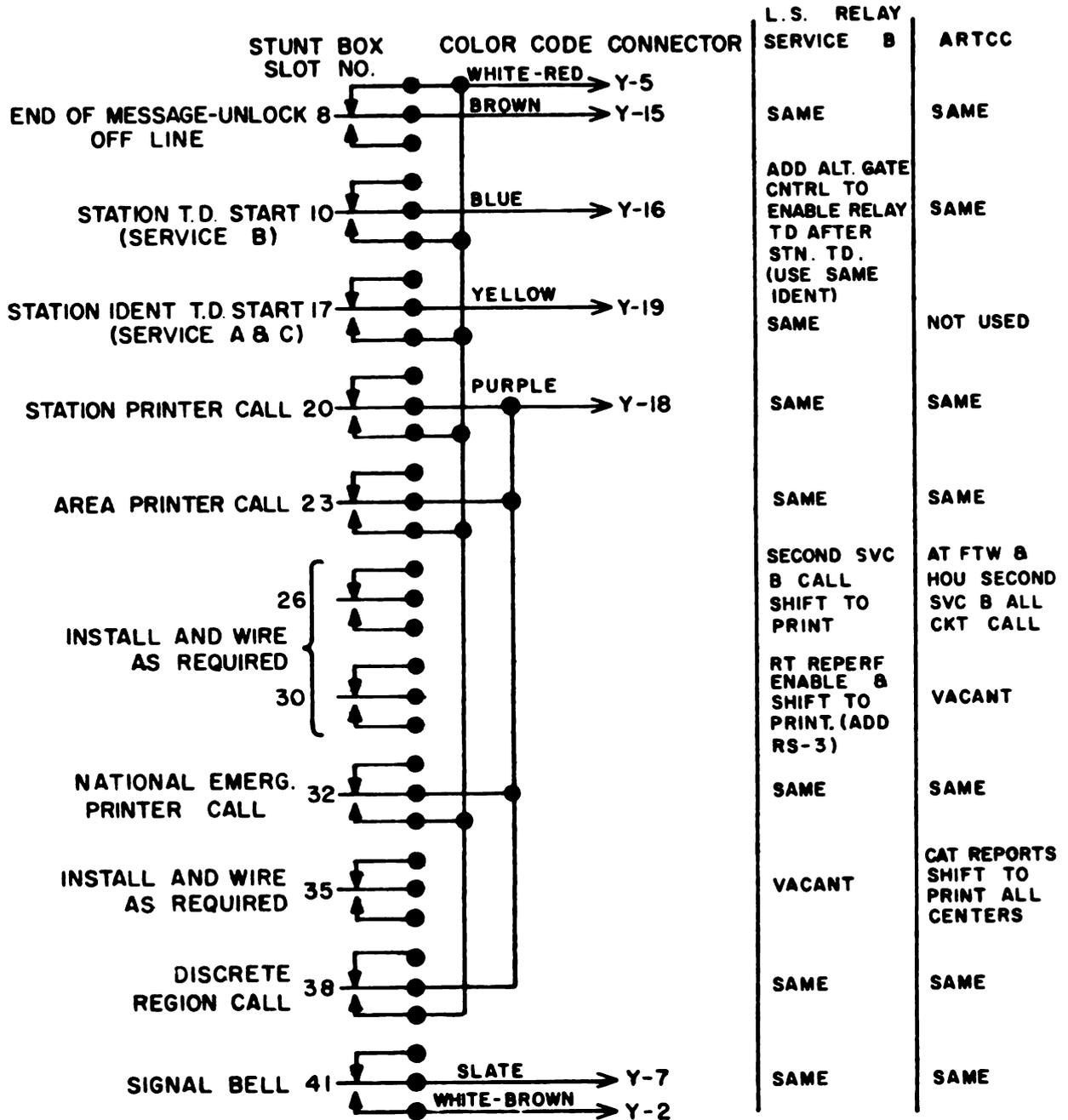


FIGURE 1
FAA STANDARD STUNT BOX WIRING

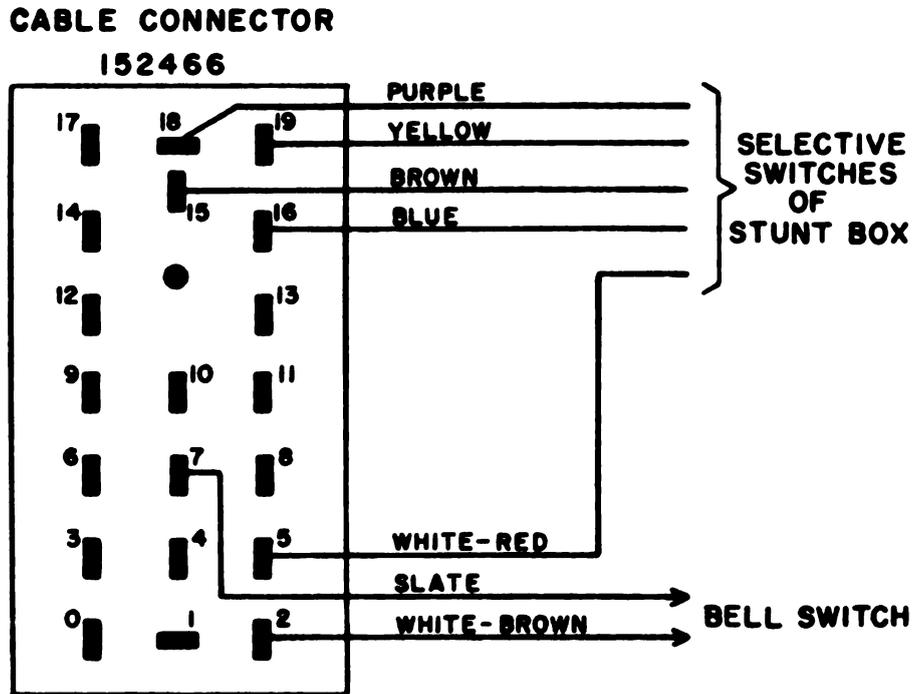
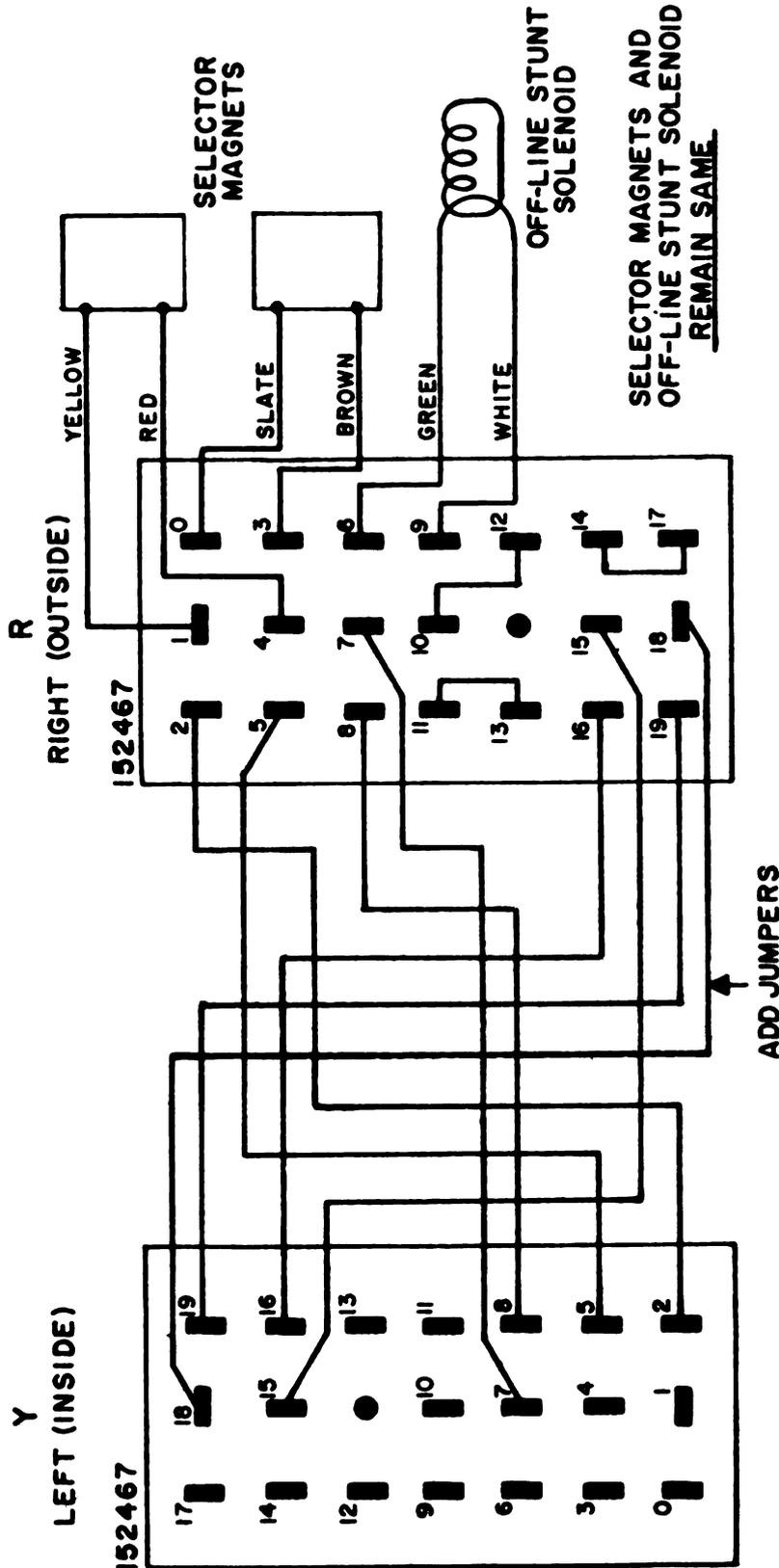


FIGURE 2. CONNECTIONS TO CABLE PLUG ON STUNT BOX WIRING



1. LEAVE SELECTOR MAGNET AND STUNT SOLENOID AS WIRED
2. STRAP TERMINALS 18 TO 18, 19 TO 19, 16 TO 16, 15 TO 15, 8 TO 8, 7 TO 7, 2 TO 2, 5 TO 5.

FIGURE 3. STRAPPING BETWEEN CONNECTORS ON TYPING UNIT.

- ST - Start Relay Contacts
- RS - Request to Start Relay Contacts
- OL - Open Line Relay Contacts
- EL - Busy Line Relay Contacts

START RELAY CONTACTS

| Slot | Function (Circuit) |
|------------|-------------------------|
| 8 | Unlock |
| 10, 17 | TD Start |
| 20, 23, 38 | Print Off Line |
| 32 | Optional Print Off Line |
| 41 | Signal Bell |

connections marked (-) in line test key and line relay circuits.

3. Unit wired for 115V 60 ~ (± 1%) AC power input. Control circuit wired for 40V DC input.
4. Spare lead from F18 is reserved for polar operation of signal generator.
5. Line break key is shown disabled with strap C10-C11. To enable the break key remove C10-C11. (APPLIES WHERE INSTALLED)
6. TD wired for 40V DC. For 110V DC remove leads from 100 resistors marked (-) and add (---) leads to 500 Ω resistors as shown.
7. FUSE SIZE: 0.375A 3AG FOR 18270 RECTIFIER ASSEMBLY.
0.8A 3AG FOR 182301 RECTIFIER ASSEMBLY.
8. EQUIPMENT AND CIRCUITRY FROM POINTS MARKED ARE NOT INSTALLED IN ASR WITH LPE-1 PERFORATOR.

**FEDERAL AVIATION AGENCY
INSTALLATION AND MATERIEL DEPOT**

**FAA STANDARD
MODEL 28 ASR TELETYPEWRITER
WIRING DIAGRAM**

| | | | | |
|----|--|---------|---|---|
| | | | TECHNICAL APPROVAL BY: <i>Ronan & Standard</i> | FINAL REVIEW BY: <i>Ronan & Taylor</i> |
| | ADDED SLOT 38. CHANGED SLOT 36 TO 32. ADDED NOTE 9. | 7-20-65 | SUBMITTED BY: <i>Wynne Michael</i> | DRAWING NO. |
| | ADDED TERMINALS C58 & C89 | 6-9-65 | DRAWN BY: DAVENPORT | DATE: 4-21-65 |
| D. | REVISION | DATE | CK'D | IMD-D-439 |

OVERALL & LOCATION DIMENSIONS $\pm 1/32$ "
DIMENSIONS BETWEEN HOLES $\pm 1/64$ "
NON-ACCUMULATIVE

FRONT
LF

**FEDERAL AVIATION AGENCY
 INSTALLATION AND MATERIEL DEPOT**

**FAA STANDARD TELETYPEWRITER
 DUCT ACCESS MODIFICATION FOR
 MDL 28 ASR CABINET**

| | | | |
|---------|------|---|--------------------------------------|
| | | TECHNICAL APPROVAL BY: <i>A. J. Heaton</i> | FINAL REVIEW BY: <i>RC Taylor</i> |
| | | SUBMITTED BY: <i>John S. Morgan</i> | DRAWING NO. IMD-C-496 |
| 7-29-65 | | DRAWN BY: MORGAN | DATE: 7-9-65 |
| | DATE | CK'D | |

CHAPTER 86. BDIS(7) TAM MODULE, TEST CIRCUIT
LINE CURRENT ADJUSTMENT

1. OBJECT. To provide a means of adjusting the BDIS test circuit line current.
2. REASON FOR MODIFICATION. Present arrangement does not provide sufficient flexibility.
3. APPLICATION. This modification shall be accomplished on the Test Accessories Module, TAM, at all BDIS Interchange Centers.
4. REFERENCES. Teletype Corporation Specification 50115S.
 - a. Schematic Diagram TAM Module, Drawing 5541WD.
 - b. Actual Wiring Diagram TAM Module, Drawing 5542WD.
5. MATERIALS REQUIRED.
 - a. One each 4000 ohm, 5 watt resistor, Teletype #177355.
 - b. One each 1000 ohm, 25 watt potentiometer. (Ohmite Model H, Ward Leonard Type 25R or equivalent.)
 - c. One each mounting bracket, Teletype #177428.
6. SOURCE OF MATERIAL. Station stock, OMD or local purchase.
7. TOOLS REQUIRED. Miscellaneous hand tools.
8. WORK TO BE PERFORMED BY. BDIS I/C maintenance technicians or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of this modification or at next routine maintenance schedule.
10. ESTIMATED TIME REQUIRED. Two man-hours.
11. DISPOSITION OF SURPLUS PARTS. Retain station stock.

12. MODIFICATION PROCEDURE.

- a. Remove turret, TB3410, from mounting plate "C". Remount turret, using threaded hole in center section of side frame, adjacent to capacitor mounting bracket "D", redress leads.
- b. Using turret terminal "F" and "L", mount the 4000 ohm resistor (part #177355), wire in parallel with the two existing 4000 ohm resistors.
- c. Remove turret mounting plate "C". Replace with new bracket, Teletype part #177428.
- d. If the 1000 ohm, 25 watt, potentiometer does not have a short shaft with screw driver slot, cut off shaft approximately $\frac{1}{4}$ " beyond threaded bushing and make screw driver slot.
- e. Mount potentiometer on bracket #177428. A washer may be required as the hole in this bracket is for switch mounting.
- f. Remove the green lead from turret terminal "G" (junction of R3405 and R3409, 4K resistors) and solder to arm of the potentiometer.
- g. Install jumper from potentiometer to turret terminal "G".

13. **TESTS AFTER MODIFICATION.** With test circuit being used in the normal manner, adjust added potentiometer for 60 ma. test circuit line current.

14. **USE.** At all BDIS Interchange Centers and equipment used in the BDIS course at the FAA Academy.

15. **RESULTS OF MODIFICATION.** A variable resistor is placed in series with the BDIS test circuit battery, permitting adjustment of the line current to optimum value, thereby providing a means of compensating for the addition or removal of equipments from the test circuit.

16. **CORRECTIONS TO DRAWINGS.** Designate the added 4000 ohm resistor as R3411 and the 1000 ohm potentiometer as R3412. (Under Notes reference this chapter.)

- a. Drawing 5541WD, show fixed and variable resistors added to the L. S. Line Test Circuitry.
- b. Drawing 5542WD, show added 4000 ohm resistor and terminals used on turret TB3410, Item "C".

17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.
18. CORRECTIONS TO RECORDED DATA. None. (Show that modification was made)

11/29/65

COMMUNICATIONS FACILITY AND EQUIPMENT MODIFICATION HANDBOOK -
SUBJ: DATA HANDLING FACILITIES AND EQUIPMENT

CHAPTER 87. SERVICE B LOW SPEED RELAY FACILITY STUNT
BOX AND CONTROL RELAY MODIFICATION

1. PURPOSE. To provide stunt box slots for immediate and future use.
2. REASON FOR MODIFICATION. To provide space for the three letter discrete Area call sequence that will be used on all Area B circuits.
3. APPLICATION. This modification shall be accomplished at all Service B relay stations, providing back up for the Service B Data Interchange System.
4. REFERENCES.
 - a. Teletype Corporation drawing 3463WD, Schematic Wiring Diagram, Transmitter Control Modification Kit.
 - b. Teletype Corporation drawing 3464WD, Transmitter Control Group Modification Kit with Reperforator Transmitter Control.
 - c. Station printer stunt box and related drawings.
 - d. Attached drawing.
 - e. IMD-D-439 and IMD-D-361.
5. MATERIALS REQUIRED. For each printer modified.
 - a. Telephone relay, Teletype Corporation #160325. (Same as RS-1)
 - b. Three function bars for the discrete Area call sequence.
 - c. Hook-up wire.
6. SOURCE OF MATERIALS. Station stock or order from Supply Management Division, AC-480.
7. TOOLS REQUIRED. Miscellaneous hand tools.

Distribution: W-1, Item 56
F-1, Item 56 (minus AL & PC)

8. WORK TO BE PERFORMED BY. Facility maintenance technicians or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of this Order or at next routine maintenance schedule.
10. ESTIMATED TIME REQUIRED. Three man-hours per unit.
11. DISPOSITION OF SURPLUS PARTS. Retain in station stock.
12. MODIFICATION PROCEDURE. Considering that all relay and terminal strip wiring is not necessarily identical at all facilities, the identification given here are those used at some facilities. At facilities not identically wired, use the terminals and relay contacts serving the same function. All intermediate terminals, jack and plug numbers are not given as they may vary between installations.
 - a. Mount relay 160325 in vacant space on relay control panel and identify as RS-3. At facilities where an auxiliary "A" panel, containing RS-2, is provided, use space on this panel.
 - b. Remove lead to shift to print bus from switch on stunt box slot 30.
 - c. Remove reperforator start lead from switch on stunt box slot 38 and connect to switch on slot 30. (goes to C-28)
 - d. Connect switch on slot 38 to shift to print bus.
 - e. Remove external lead from C-28 (goes to RT unit RTS relay) and connect to nearest unused "C" terminal.
 - f. Connect the RS-3 coil terminal below the contact stack to the bottom terminal of the lower pair of contacts (terminal 1) and to N29. (N29 lead goes through cable to C71)
 - g. Connect remaining RS-3 coil terminal to N22. (-48V from C-64)
 - h. Connect relay terminal 2 of lower pair of contacts to N2 which goes to C-32 and coil of DC relay.
 - i. Connect Relay terminal 3 to N15 (+ 48V).
 - j. Connect relay terminal 4 to N28 which goes to C-70.
 - k. Jumper C-71 to C-28.
 - l. Jumper C-70 to vacant terminal used in e.
 - m. Remove X - - - Four letter sequence, function bars from slots 35, 36, 37, and 38.

- n. Insert appropriate three letter discrete Area call sequence in slots 36, 37, and 38. The facility ATS supervisor will advise as to appropriate Area call.
13. TESTS AFTER MODIFICATION. Using test tapes and circuits determine the following:
- a. Using the four letter relay reperforator call sequence, note that the reperforator is enabled, punches tape and that a copy is printed.
 - b. When the discrete Area call sequence is received, a shift to print function should occur and the message copied.
 - c. Note that other stunt box functions not effected by this modification, performs normally.
14. USE. This modification shall be made to the printing equipment used on the Service B circuits as well as stand by or spare unit.
15. RESULTS OF MODIFICATION.
- a. A shift to print function will be combined with the reperforator enable sequence.
 - b. A shift to print function will be accomplished upon receipt of the discrete Area call sequence.
 - c. Stunt box slot 35 will be vacant.
16. CORRECTION TO DRAWINGS. Show wiring and stunt box changes on related station and Teletype Corporation drawings.
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.
18. CORRECTION TO RECORDED DATA. None. (Note that modification has been made.)

APPROVED NOVEMBER 29, 1965



**CHAPTER 88. MODIFICATION - PLAN 59 FASS CHANGE
OF DIVERSION INDICATOR AND CHECK
INDICATOR IN AFTN MESSAGE FORMAT**

1. **OBJECT.** This modification to existing equipment wiring will allow logic element to detect and respond to one "V" out of the New Diversion indicator character combination of "VVV".
2. **REASON FOR MODIFICATION.** A change in the international ICAO message procedure has been initiated by ICAO Headquarters at Montreal. The change consists of substitution of the letters combination of "VVV" for "QSP" as the diversion indicator and "CH" for "CK" as the check indicator.
3. **APPLICATION.** This modification shall be accomplished at FASS Plan 59 installations at Honolulu and Balboa IFSS/ATCC facilities.
4. **REFERENCES.**
 - a. Western Union specification 11989-A-4, Line Send-Receive Cabinet 9938-A.
 - b. Western Union specification 12732-B-2, SOM Reading Chassis 9988-A and 9988.1-A.
 - c. Western Union drawing 311355-B-2, Plan 59 - Line Receiving Position Diversion Indicator Reading Circuit.
5. **MATERIALS REQUIRED.** Ten (10) feet of #22 AWG, stranded, black, polyethylene insulation or equal wire.
6. **SOURCE OF MATERIAL.** Station stock or local purchase.
7. **TOOLS OR TEST EQUIPMENT REQUIRED.** Standard station miscellaneous hand tools.
8. **WORK TO BE PERFORMED BY.** Plan 59 maintenance technicians or as determined by the Regional Director.
9. **WHEN MODIFICATION IS TO BE PERFORMED.** Upon receipt of notice of effective date from AT-300, estimated to be October 1, 1965.

10. ESTIMATED TIME REQUIRED. Two man-hours per Line Send-Receive Cabinet.
11. DISPOSITION OF SURPLUS PARTS. Character Reader Circuit Card 9853.1 (designated S2) and Flip Flop Circuit Cards 9830-A (designated S4 and S5) are no longer required and can be removed and placed in station stock when wiring modifications have been accomplished.
12. MODIFICATION PROCEDURE.
 - a. Referring to Western Union Specification 11989-A-4 for the Line Send-Receive Cabinet 9938-A, make the following wiring change:
 - (1) Add a wire from S.O.M.-24 to QSP-4. (Location of S.O.M. and QSP shown on Drawing 193488-9-C of Specification 11989-A-4.)
 - b. Referring to Western Union Specification 12732-B-2 for the S.O.M. Reading Chassis 9988.1-A, make the following wiring changes:
 - (1) Remove wire from S3-N to S2-N.
 - (2) Add wire from P1-4 to S3-N
 - (3) Remove wire from S4-D to P1-6.
 - (4) Remove wire from S5-J to S1-3.
 - (5) Add wire from P1-6 - S1-3.
13. TEST AFTER MODIFICATION. Make up test message using "VVV" in place of "QSP" for diversion action. Diversion should be accomplished upon the detection of only one "V" out of the New Diversion indicator character combination "VVV". The Character Reader Circuit Card 9853.1 (designated S3) with the wiring change will read a "V" output and provide a pedestal for Thyatron Module 10049-A (designated S1) and the SN1 probe will provide a positive pulse to fire the thyatron when its cathode is keyed. The cathode is only keyed when the main switch of the Sequence Number Indicator is on stud 10.
14. USE. At Honolulu and Balboa IFSS/ATCC Plan 59 facilities.
15. RESULTS OF MODIFICATIONS. The Plan 59 FASS installations at Honolulu and Balboa IFSS/ATCC facilities are now modified and able to process messages in accordance with the new Diversion and Check Indicator changes authorized by ICAO Headquarters.

16. CORRECTION TO DRAWINGS. Add Western Union Drawing #311355-B-2 to Line Send-Receive Cabinet Specification 11989-A-4.
17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.
18. CORRECTIONS TO RECORDED DATA. None.

12/13/65

COMMUNICATIONS FACILITIES AND EQUIPMENT MODIFICATION HANDBOOK -
SUBJ: DATA HANDLING FACILITIES AND EQUIPMENT.

CHAPTER 89. MODIFICATION - ADIS H/L CONVERTER

1. PURPOSE. To provide a switch for the control of the LEXD-8 R/T LTHS 202, H/L Converter ADIS Equipment.
2. REASON FOR MODIFICATION. To prevent repeating of Canadian NOTAM traffic on the 8022 circuit.
3. APPLICATION. This modification shall be made on all ADIS Interchange Facilities.
4. REFERENCES.
 - a. Teletype Corporation specification 5990S, actual wiring diagram.
 - b. Teletype Corporation specification 5990S, schematic wiring diagram.
 - c. Figure numbers 1 and 2.
5. MATERIALS REQUIRED.
 - a. One (1) 125V DPST Switch, similar to Teletype Part No. 171670.
 - b. Hook-up wire.
6. SOURCE OF MATERIALS. Station stock or local purchase.
7. TOOLS REQUIRED.
 - a. Standard station miscellaneous hand tools.
 - b. Electric drill and correct drill bits.
8. WORK TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
9. WHEN MODIFICATION IS TO BE PERFORMED. As scheduled by the Region or Area Offices.

Distribution: List W-1, Item No. 8
List F-1, Item No. 8

10. ESTIMATED TIME REQUIRED. Two man-hours.
11. DISPOSITION OF SURPLUS PARTS. None.
12. MODIFICATION PROCEDURE. (Reference Figure No. 1)
 - a. Mounting of switch.
 - (1) Remove "letters delete" switch from front plate.
 - (2) Remove front plate from the module.
 - (3) Mark front plate as shown in Figure 5 and drill.
 - (4) Mount switch on front plate.
 - (5) Wire switch as in step (e).
 - b. Place H/L Converter in test circuit and cut off all power.
 - c. Remove standard speed transmitter distributor control module (LBXDCO). Teletype Corporation Part No. 170581 from converter cabinet.
 - (1) Remove Z5207, Z5202 and Z5203 from module (this is to prevent possible damage to circuit cards.)
 - d. Remove front plate Teletype Corporation Part No. 170511 from module.
 - e. Wiring of the switch. (Reference Figure No. 2)
 - (1) Solder four (4) wires about fifteen (15) inches long to the terminal of the switch as shown in Figure 2.
 - (2) Run wires along the lower left side of the module frame.
 - (3) Connect wire from terminal 1 of the switch to terminal 3 of K 5203.
 - (4) Connect wire from terminal 3 of the switch to terminal 3B of K 5203.
 - (5) Connect the wire from terminal 2 of the switch to terminal 2 of K 5203.
 - (6) Connect the wire from terminal 4 of the switch to terminal 2B of K 5203.

- f. Reinstall front on module.
- g. Reinstall circuit cards.
- h. Reinstall module in converter and turn on power.

13. TEST AFTER MODIFICATION.

- a. Set up a complete area test circuit with modified H/L Converter as priority 1.
- b. With normal traffic tapes in the three LBXD-8, start modified H/L LBXD-8 transmitting. (Throw switch to down position.)
 - (1) LBXD-8 should stop transmitting.
 - (2) The visual alarm light (red) should come on.
 - (3) A series of line feeds should be transmitted.
 - (4) Transfer to the next priority of traffic should take place.
- c. Throw the switch to the up position.
 - (1) The visual alarm light should go out.
 - (2) After normal traffic read out (next EOM) the LBXD-8 transmitting should stop and transfer back to the H/L converter under test.

14. USE. At all ADIS interchange facilities where external control of the LBXD-8 is desirable.

15. RESULT OF MODIFICATION. The operation may stop the LBXD-8 from transmitting without interfering with other units transmitting.

16. CORRECTIONS TO DRAWINGS. Correct lightly in red pencil, Drawings 5002WD and 5003WD.

17. CORRECTIONS TO INSTRUCTIONS. Correct associated instructional material as appropriate.

18. CORRECTIONS TO RECORDED DATA. None.

APPROVED DECEMBER 13, 1965



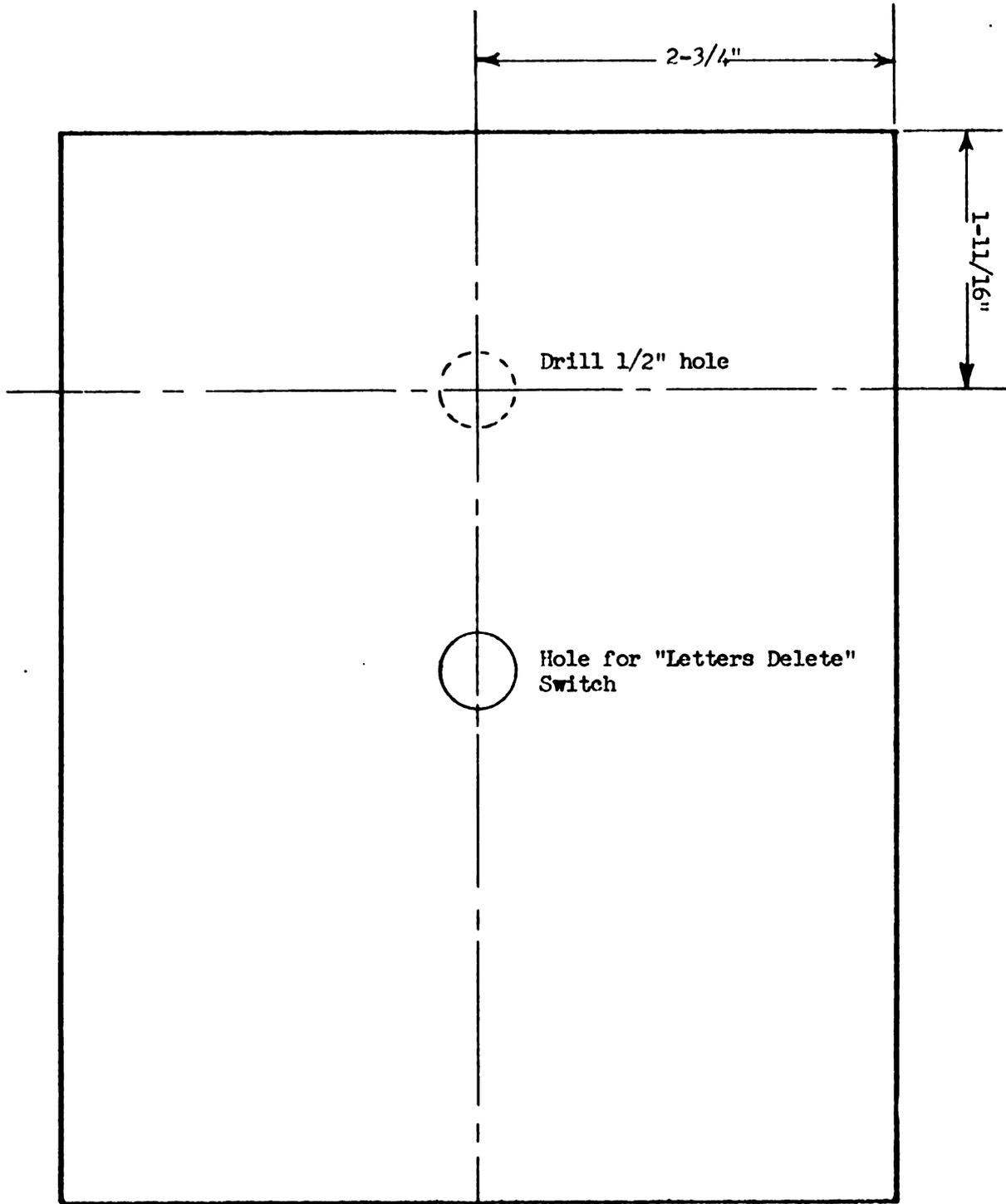


FIGURE 1

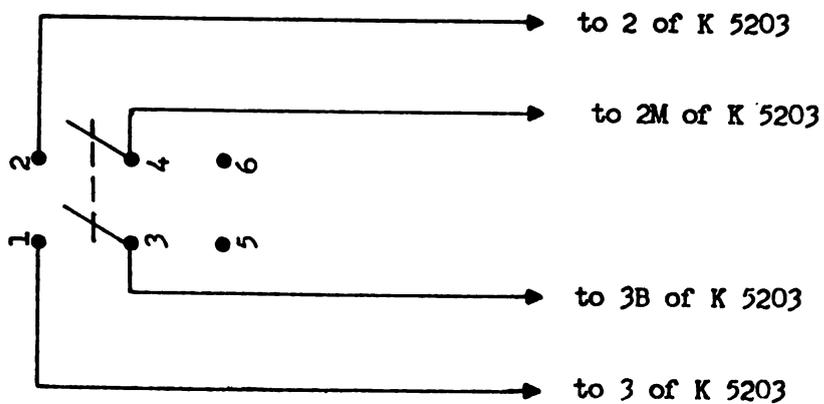


FIGURE 2

FEDERAL AVIATION AGENCY
WASHINGTON, D. C.

6170.1
1/14/69

1/7/66

COMMUNICATIONS FACILITY AND EQUIPMENT MODIFICATION HANDBOOK
SUBJ: DATA HANDLING FACILITIES AND EQUIPMENT

CHAPTER 90. BDIS SYSTEM LCAC 291 COMBINATION CONVERTER
CABINET, TERMINAL STRIP MODIFICATION

1. PURPOSE. To provide insulating covers for exposed terminals.
2. CANCELLATIONS. None.
3. REASON FOR MODIFICATION. To eliminate a possible short hazard and equipment damage.
4. APPLICATION. This modification shall be accomplished at all Service B Data Interchange Centers (BDIS).
5. REFERENCES.
 - a. Teletype Corporation Specification 50116S Tabulation of Cabinet wiring for FAA-BDIS Drawing 5546 WD sheet 11.
 - b. Teletype Corporation Specification 50411S (part of modification kit).
6. MATERIALS REQUIRED. 311912 Teletype Corporation Modification Kit S/N 0000-005-0000. Two required for each LCAC 291 cabinet.
7. SOURCE OF MATERIALS. Order from Supply Management Branch, AC480.
8. TOOLS REQUIRED. Miscellaneous hand tools.
9. WORK TO BE PERFORMED BY. Facility maintenance technicians or as determined by the Regional Director.
10. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of material.
11. ESTIMATED TIME REQUIRED. Thirty minutes per cabinet.
12. DISPOSITION OF SURPLUS PARTS. None.
13. MODIFICATION PROCEDURES.
 - a. Locate the 150 and 125 point wire wrap terminal boards TB5013 and TB6016 mounted on the shelf above the H/L and L/H units in the rear of the LCAC 291 cabinets.

Distribution: W-1, Item 56
F-1, Item 56 except PC and AL

- b. From two diagonally opposite corners of the wire wrap terminal plate, remove screws, lock washers and nuts, retain for reassembly.
- c. Using posts supplied with kit, mount cover plate.
- d. The cover plate may touch or rest upon the wire wrap terminals providing additional support.

- 14. TESTS AFTER MODIFICATION. None.
- 15. USE. This modification shall be made on all LCAC 291 combination converter cabinets.
- 16. RESULTS OF MODIFICATION. The wire wrap terminals will be protected from shorts that may be caused by tools, test leads and other objects falling across them.
- 17. CORRECTIONS TO DRAWINGS. None.
- 18. CORRECTIONS TO INSTRUCTIONS. None.
- 19. CORRECTIONS TO RECORDED DATA. None (Note that modification has been made.)

APPROVED JANUARY 7, 1966



January 7, 1966

COMMUNICATION FACILITY AND EQUIPMENT MODIFICATION HANDBOOK -
SUBJ: DATA HANDLING FACILITIES AND EQUIPMENT

CHAPTER 91. ADIS (26) LBXD-8 TRANSMITTER DISTRIBUTOR TIGHT
TAPE AND START STOP SWITCH CIRCUIT MODIFICATION

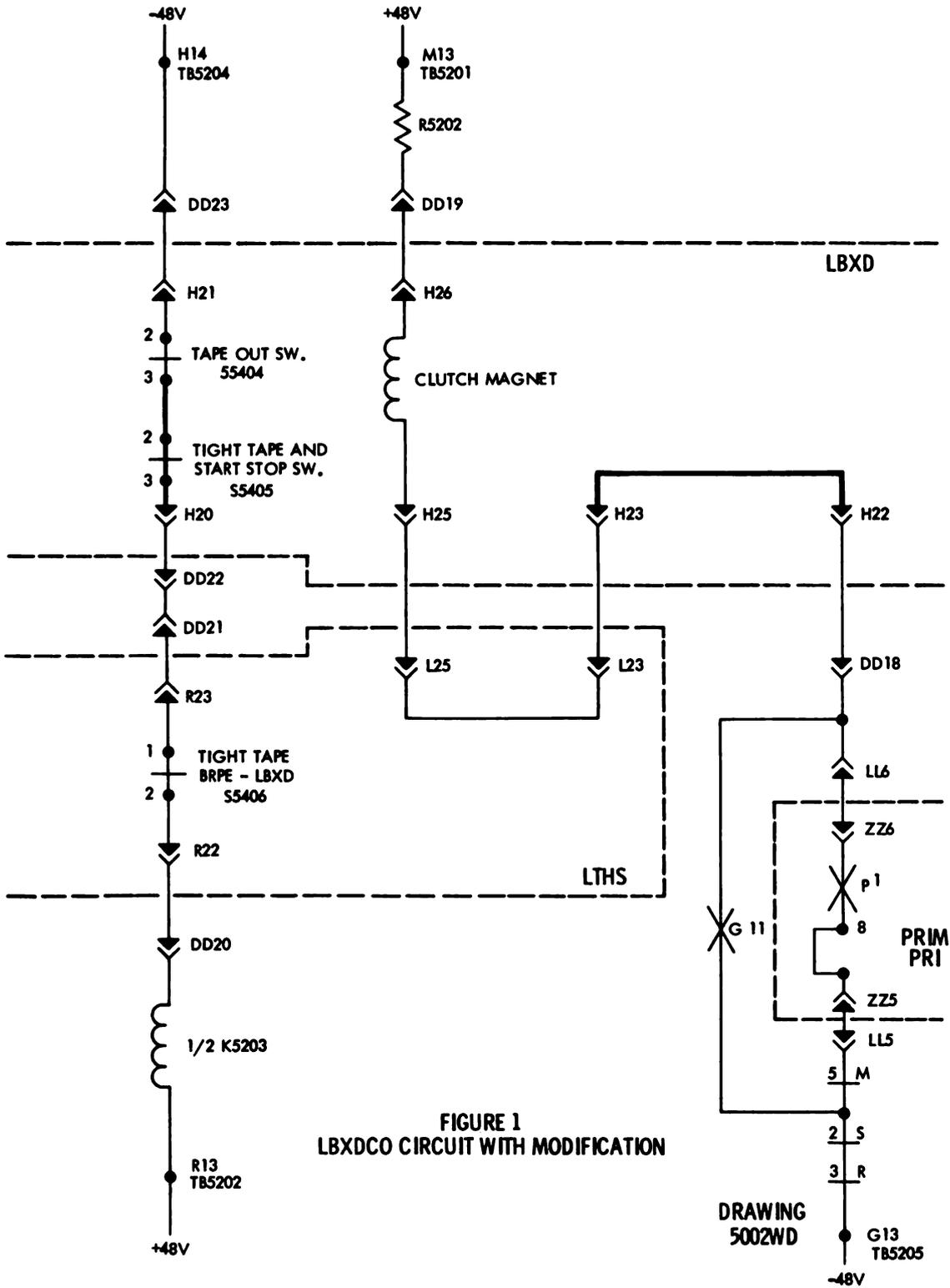
1. PURPOSE. This modification will provide an additional alarm and assist in the identification of a malfunction in the tape feeding component of a High-to-Low Converter Unit.
 2. CANCELLATIONS. None.
 3. REFERENCES.
 - a. Teletype Corporation specifications 5990S VOL #1, wiring diagram number 5002WD for Low Speed Transmitter Distribution Control Circuit (LBXDCO).
 - b. FIG. 1, Modified LBXDCO Circuit.
 4. BACKGROUND. Under certain operating conditions, the low-speed transmitter distributor of the H/L Converter is stopped and the associated non-typing reperforator (IRPE) is "Blinded" to messages. As the equipment stands containing these devices are pushed back into the cabinet out of sight of Operations Personnel, it is possible for messages that should be relayed to other destinations to be lost.
 5. APPLICATION. This modification shall be accomplished to all H/L Converter Units at all ADIS I/S and S/R Sites.
 6. MATERIALS REQUIRED. As required, #24 AWG, hook-up-wire, stranded, polyethylene insulation or equal.
 7. SOURCE OF MATERIALS. Station stock or local purchase.
 8. TOOLS AND TEST EQUIPMENT REQUIRED. Standard station hand tools and test equipment.
 9. MODIFICATION TO BE PERFORMED BY. ADIS maintenance technicians or as determined by the Regional Director.
 10. WHEN MODIFICATION IS TO BE PERFORMED. Upon receipt of this Chapter or during next routine maintenance schedule.
-

Distribution: List W-1, Item No. 8
List F-1, Item No. 8

11. MODIFICATION PROCEDURE.
 - a. Remove white -yellow and blue wires from terminals H-23 and H-22 of P-5407 and blue wire from contact 3 of S5405.
 - b. Solder a jumper wire across terminals H-23 and H22 of P-5407.
 - c. Remove Orange wire from terminal H-20 of P-5407 (remove from wiring harness up to the plastic tubing) and connect to contact 3 of S5405.
 - d. Connect white - yellow wire (disconnected in step a) to terminal H-20 of P-5407.
 - e. Tape ends of blue wires removed from H-22 and contact 3, lay back in cable harness and lace in place.
12. TEST AFTER MODIFICATION. Place modified H/L Converter in a test circuit, transmit a test message and during the transmission of the test message twist or tangle the tape so the lid of the LBXD-8 is lifted. The Tape Failure Alarm Circuit should be activated, notifying Operations Personnel of the LBXD-8 transmitter distributor failure or malfunction.
13. USE. On all the ADIS H/L Converter Units.
14. RESULTS OF MODIFICATION. Will provide a required visual and audible alarm to detect a malfunction in the operation of the LBXD-8 transmitter distributor. (Part of the H/L Converter Unit.)
15. CORRECTION TO DRAWINGS. Correct Teletype Corporation Wiring Diagram 5002WD to reflect wiring changes to the Tape Condition and Power Failure Alarm Circuit.
16. CORRECTION TO INSTRUCTIONS. Correct associated instructional material as appropriate.
17. CORRECTION TO RECORDED DATA. None.

APPROVED JANUARY 7, 1966





May 10, 1966

COMMUNICATION FACILITY AND EQUIPMENT MODIFICATION HANDBOOK -
SUBJ: DATA HANDLING FACILITIES AND EQUIPMENT

CHAPTER 92. MODIFICATION - TELETYPEWRITER TYPE 28
TYPE BOXES AND SPACING MECHANISM FOR
12 CHARACTERS PER INCH

1. PURPOSE. To modify the Model 28 teletypewriters used on the AUTODIN circuits to print 12 characters per inch, 80 characters per line.
2. CANCELLATIONS. AF P 6620.1 Chapter 68, CH 22.
3. REFERENCES. Teletype Corporation specification 5872S.
4. BACKGROUND. Normal teletypewriter messages in AUTODIN operation are limited to 70 characters per line. However, as the possibility exists that a message of more than 70 characters per line could be received with subsequent pile-up of characters at the end of the line, it has been decided that all AUTODIN printers will have the capability to accept up to 80 characters per line. To accomplish this, it is necessary to change the type boxes to print 12 characters per inch, as well as to modify and readjust the spacing mechanism of the receiving printers.
5. APPLICATION. All teletypewriters installed for use with the AUTODIN network.
6. MATERIALS REQUIRED.
 - a. Teletype Corporation modification kit #154792.
 - b. Teletype Corporation modification kit #179057.
7. SOURCE OF MATERIALS. The kits are to be requisitioned from the FAA Depot.
 - a. Kit #154792, FSN 9258 154 1734.
 - b. Kit #179057, FSN 9258 154 1735.
8. SPECIAL TOOLS AND TEST EQUIPMENT REQUIRED. Standard station teletypewriter tools and test equipment.

Distribution: List W-1, Item No. 30
List F-1, Item No. 30

9. MODIFICATION TO BE PERFORMED BY. Maintenance technician during normal maintenance routine.
10. WHEN MODIFICATION IS TO BE PERFORMED. As soon as practicable after receipt of the modification kits.
11. ESTIMATED TIME REQUIRED. Six (6) man-hours.
12. DISPOSITION OF SURPLUS PARTS. Hold for station spares.
13. MODIFICATION PROCEDURE.
 - a. Instructions for modifying the printer spacing mechanism are included with the 154792 kit.
 - b. Replace the type box with the 179057 type box.
 - c. Readjust the printer for receiving 80 characters per line according to the instruction manual for the equipment.
 - d. DO NOT readjust keyboard character counter.
14. TEST AFTER MODIFICATION. Thoroughly check printer operation.
15. RESULT OF MODIFICATION. All FAA teletypewriters used for handling secure communications will be compatible with those used by DCS.
16. CORRECTIONS TO INSTRUCTION BOOKS. None.
17. CORRECTIONS TO INSTALLATION DRAWINGS. None.

APPROVED MAY 10, 1966



9/27/66

SUBJ: ELECTRONIC EQUIPMENT MODIFICATION HANDBOOK - TELETYPEWRITER

**CHAPTER 93. MODIFICATION - TELETYPEWRITER
M-28 ASR KEYBOARD (IAK)**

1. **PURPOSE.** To improve the character counter for the Model 28 Keyboard (IAK).
2. **CANCELLATIONS.** None.
3. **REFERENCES.**
 - a. Teletype Corporation Specification 50080S.
 - b. Teletype Corporation Bulletin 250-B (Adjustment).
 - c. Teletype Corporation Bulletin 1169-B (Parts).
4. **BACKGROUND.** The character counter at times becomes sluggish or binds at the right end of the scale and does not return to "Zero" when "carriage return" key is pressed.
5. **APPLICATION.** This modification applies to all M-28 ASR teletypewriter sets where character counters are used.
6. **MATERIALS REQUIRED.**
 - a. One each, 178728 modification kit for each M-28 ASR set. Kit consists of:
 - One each, 104807 Washer, Flat
 - One each, 110743 Washer, Lock
 - One each, 151152 Screw
 - One each, 155960 Latch
 - One each, 155964 Lever, Stop
 - One each, 178725 Spring
 - One each, 178726 Bracket, Spring
 - One each, 178849 Cord Assembly, Indicator
 - One each, 178851 Pulley
 - One each, 179258 Bracket, Scale w/stud

Distribution: List W-1, Item No. 30
List F-1, Item No. 30

7. SOURCE OF MATERIAL. Modification Kit 178728 may be requisitioned from the Supply Management Branch, AC-480, Aeronautical Center, using Federal Stock Number (FSN) 5815-979-3842.
8. SPECIAL TOOLS AND TEST EQUIPMENT REQUIRED. Standard station and teletypewriter equipment hand tools.
9. MODIFICATION TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
10. WHEN MODIFICATION IS TO BE PERFORMED. During the next routine maintenance or as directed by the Regional Director.
11. ESTIMATED TIME REQUIRED. Two man-hours.
12. DISPOSITION OF SURPLUS PARTS. Discard. No economic value.
13. MODIFICATION PROCEDURE. Follow the step-by-step procedure outlined in the Specification (50080S) enclosed with each set of parts.
14. TEST AFTER MODIFICATION. Position the character counter to the extreme right of the scale by operating the keyboard. Press the "CR" key. The pointer should return to "Zero" freely.
15. RESULT OF MODIFICATION. The character counter will traverse more freely in spite of the taut-cord condition which results from the shrinkage of the dacron cord and the expansion of the nylon pulleys.
16. CORRECTIONS TO INSTRUCTION BOOKS. Correct Teletype Corporation Bulletins as noted in Specification 50080S.
17. CORRECTIONS TO INSTALLATION DRAWINGS. None.
18. CORRECTIONS TO RECORDED DATA. Record modification of FAA Form 3353.

APPROVED SEPTEMBER 27, 1966



10/4/66

ELECTRONIC EQUIPMENT MODIFICATIONS HANDBOOK - AUTOMATIC PROGRAM
SUBJ: UNIT LOW SPEED (APULS)

CHAPTER 94. MODIFICATION TO APULS
LINE KEYING RELAY

1. PURPOSE. To change the type of relay used as the APULS keying relay, K101.
2. CANCELLATIONS. None.
3. REFERENCE. APULS Instruction Book.
4. BACKGROUND. The present K101 keying relay used in the APULS requires excessive maintenance time and replacement parts cost. Replacing this relay with a Clare HGS5106 mercury wetted polar relay eliminates maintenance. Life expectancy of the HGS5106 is in excess of 12 years.
5. APPLICATION. All APULS units.
6. MATERIALS REQUIRED. One each, HGS5106 relay per APULS unit. One each, insulated tie point.
7. SOURCE OF MATERIALS. The relays are to be requisitioned from the FAA Depot, FSN 9259-454-5396. The insulated tie point to be obtained from local stock.
8. SPECIAL TOOLS AND TEST EQUIPMENT REQUIRED. None.
9. MODIFICATION TO BE PERFORMED BY. Maintenance technician during normal maintenance routine.
10. WHEN MODIFICATION IS TO BE PERFORMED. When local stock of spare parts for Sigma 72 type relay is exhausted, the HGS5106 is to be requisitioned as a replacement relay.
11. ESTIMATED TIME REQUIRED. Thirty minutes.
12. DISPOSITION OF SURPLUS PARTS. Station stock.

Distribution: List W-1, Item 4
List F-1, Item 4

13. MODIFICATION PROCEDURE.

- a. The HGS5106 relay has an internal shield and the external metal case connected to pin #5. Pin #5 of relay socket XK101, however, has been used as a tie point between resistor R103 and C105. It will be necessary, therefore, to remove the resistor and wire connection from pin #5, XK101, and reterminate it on an insulated tie point. This tie point can be conveniently mounted under the nut holding CR105, 106 and 107.
- b. Ground pin #5 of XK101.
- c. Install the HGS5106 relay in the XK101 socket.

14. TEST AFTER MODIFICATION. Check APULS signal output for conformance with transmitted distortion standards.

15. RESULT OF MODIFICATION. K101 will no longer require adjustment.

Maintenance time will be reduced.

NOTE: The HGS5106, being of a mercury wetted design, must be operated within 30° of vertical. All testing of the APULS Unit with this relay in the circuit must be made with the chassis in its normal horizontal position.

16. CORRECTIONS TO INSTRUCTION BOOKS. Correct APULS Instruction Book to reflect HGS5106 relay for K101 in place of Sigma 72AOZ 10TS-TOP relay.

17. CORRECTIONS TO INSTALLATION DRAWINGS.

- a. Correct APULS wiring diagram to reflect removal of R103 and lead to C105 from pin #5 of XK101.
- b. Ground pin #5 of XK101.
- c. The APULS schematic drawing shows the upper contact of the Form C contacts of K101 and K110 as pin #5. This is an error. Change this designation to pin #4.

APPROVED OCTOBER 4, 1966



October 31, 1966

ELECTRONIC EQUIPMENT MODIFICATION HANDBOOK -
SUBJ: M-28 TELETYPEWRITER EQUIPMENT

**CHAPTER 95. MODIFICATION TO PERMIT USE OF
MERCURY WETTED POLAR LINE RELAY**

1. **PURPOSE.** To allow the use of an improved type of mercury wetted polar relay as the line relay in the M-28 teletypewriter equipments.
Note: It is not, however, the intent of this EEM to authorize wholesale replacement of all 33RY line relays now in use.
2. **CANCELLATIONS.** None.
3. **REFERENCES.** M-28 teletypewriter equipment instruction books.
4. **BACKGROUND.** A test program was initiated to ascertain if the noise radiated from the M-28 teletypewriter could be reduced without modification of the equipments themselves. This program was undertaken due to interference being experienced in radio receiving equipments when located in close proximity to teletypewriter equipments. Tests revealed that the use of the type HGSX 5066 mercury wetted polar relay, with a double shielding arrangement and built in contact protection filter, would reduce the noise radiated by the line relay circuit.

This type of relay is completely sealed and is not affected by local atmospheric conditions such as salt air. No maintenance adjustments are required and the estimated life of this relay greatly exceeds that of the RY33. It is directly interchangeable with the type 33RY and may be operated in a vertical or horizontal position. It has been determined, therefore, that this relay will be supplied in place of the type 33RY now in use when the stock of 33RY relays is depleted.

5. **APPLICATION.**
 - a. Where required to reduce radiated noise from the line relay circuit of the M-28 equipments.
 - b. At locations where local or atmospheric conditions result in excessive deterioration of the 33RY relay.
 - c. When supplied by the Depot as a replacement for the 33RY relay.

Distribution: List W-1, Item 30
List F-1, Item 30

6. MATERIALS REQUIRED. One each, HGSX 5066 relay per line relay socket and short piece of hookup wire.
7. SOURCE OF MATERIALS. The HGSX 5066 relay may be requisitioned from the FAA Depot, FSN 9259-454-5397. The hookup wire is to be obtained from station stock.
8. SPECIAL TOOLS AND TEST EQUIPMENT REQUIRED. None.
9. MODIFICATIONS TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
10. WHEN MODIFICATION IS TO BE PERFORMED. At time of installation of the HGSX 5066 relay.
11. ESTIMATED TIME REQUIRED. Ten minutes.
12. DISPOSITION OF SURPLUS PARTS. Station stock.
13. MODIFICATION PROCEDURE.
 - a. Ground pin 8 of the line relay socket.
 - b. Install HGSX 5066 relay.
14. TEST AFTER MODIFICATION. Check equipment operation to ascertain that it is operating within the required tolerances.
15. RESULT OF MODIFICATION. Noise radiated from the line relay circuit will be reduced. Maintenance of the line relay will be eliminated and local or atmospheric conditions will not affect the relay operation.
16. CORRECTIONS TO INSTRUCTION BOOKS. None required.
17. CORRECTIONS TO DRAWINGS. On drawing IMD-D-439 show a ground on line relay terminal J-2-8.

APPROVED OCTOBER 31, 1966



DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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12/19/67

SUBJ: ELECTRONIC EQUIPMENT MODIFICATION HANDBOOK - TELETYPEWRITER

CHAPTER 96. TELETYPEWRITER
REVISED PAPERWINDERS, FW201, FW203,
FW204, FW206, FW207

1. PURPOSE. To provide paper spindle shaft support brackets and bearings. This revision is issued to include additional technical information recently received, to correct technical errors in the original, and to provide a Federal Stock Catalog number for Teletype Corporation Part Number 149670 Set of Parts.
2. WITHDRAWALS. Chapter 96 of AF P 6620.1 CHG 55 dated 2/15/67, is withdrawn.
3. REFERENCES.
 - a. Teletype Corporation Specification 50318S.
 - b. Teletype Corporation Bulletin 1129B (570-301-803TC).
4. BACKGROUND. Paperwinders in the field are subject to excessive wear on the motor reduction gear shaft where the heavy paper roll rests. The 149670 part set prevents this condition by providing a hardened paper spindle shaft, disc, needle bearings, support brackets and associated hardware to relieve the weight of the paper spindle and paper from the motor reduction gear shaft. This modification does not compensate for excessive wear introduced by use of paperwinder in monitoring service where extensive (3 to 10 foot) lengths of copy are repeatedly pulled out against the motor torque. For such service, the LPW300 paperwinder per Teletype Corporation Section 570-301-705TC is recommended.
5. APPLICATION. This modification applies to 8½" width paperwinders, FW201, FW203, FW204, FW206 and FW207 used with page printers.
6. MATERIALS REQUIRED. One each, Teletype Corporation Parts set, Part No. 149670, Federal Stock Catalog Number 5815-021-0853.
7. SOURCE OF MATERIALS. May be requisitioned from Supply Management Branch, AC-480, Aeronautical Center, after May 1, 1968.

Distribution: List W-1, Item 30
List F-1, Item 30

8. SPECIAL TOOLS AND EQUIPMENT REQUIRED. Standard station teletypewriter equipment and hand tools.
9. MODIFICATIONS TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
10. WHEN MODIFICATION IS TO BE PERFORMED. During next routine maintenance or as determined by Regional Director.
11. ESTIMATED TIME REQUIRED. Eight man-hours.
12. DISPOSITION OF SURPLUS PARTS. Discard. No economic value.
13. MODIFICATION PROCEDURE. Follow the step-by-step procedure outlined in the Specification (50318S), enclosed with each set of parts.
14. TEST AFTER MODIFICATION. Mount paperwinder in customary position, install full roll of teletypewriter paper and check carefully to ascertain that paper roll weight is now borne by the newly installed disc and associated bearings.
15. RESULT OF MODIFICATION. Excessive wear of the motor reduction gear shaft will be eliminated with consequent reduction in maintenance.
16. CORRECTIONS TO INSTRUCTION BOOKS. None.
17. CORRECTIONS TO INSTALLATION DRAWINGS. None.
18. CORRECTIONS TO RECORDED DATA. Record modification on FAA Form 3353.
19. CORRECTIONS TO TABLE OF CONTENTS. This Chapter will be included in the next revision of the table of contents for this Handbook.


Warren C. Sharp, Chief
Maintenance Engineering Division
Systems Maintenance Service

12/19/67

SUBJ: ELECTRONIC EQUIPMENT MODIFICATION HANDBOOK - TELETYPEWRITER

CHAPTER 96. TELETYPEWRITER
REVISED PAPERWINDERS, FW201, FW203,
FW204, FW206, FW207

1. **PURPOSE.** To provide paper spindle shaft support brackets and bearings. This revision is issued to include additional technical information recently received, to correct technical errors in the original, and to provide a Federal Stock Catalog number for Teletype Corporation Part Number 149670 Set of Parts.
2. **WITHDRAWALS.** Chapter 96 of AF P 6620.1 CHG 55 dated 2/15/67, is withdrawn.
3. **REFERENCES.**
 - a. Teletype Corporation Specification 50318S.
 - b. Teletype Corporation Bulletin 1129B (570-301-803TC).
4. **BACKGROUND.** Paperwinders in the field are subject to excessive wear on the motor reduction gear shaft where the heavy paper roll rests. The 149670 part set prevents this condition by providing a hardened paper spindle shaft, disc, needle bearings, support brackets and associated hardware to relieve the weight of the paper spindle and paper from the motor reduction gear shaft. This modification does not compensate for excessive wear introduced by use of paperwinder in monitoring service where extensive (3 to 10 foot) lengths of copy are repeatedly pulled out against the motor torque. For such service, the LFW300 paperwinder per Teletype Corporation Section 570-301-705TC is recommended.
5. **APPLICATION.** This modification applies to 8½" width paperwinders, FW201, FW203, FW204, FW206 and FW207 used with page printers.
6. **MATERIALS REQUIRED.** One each, Teletype Corporation Parts set, Part No. 149670, Federal Stock Catalog Number 5815-021-0853.
7. **SOURCE OF MATERIALS.** May be requisitioned from Supply Management Branch, AC-480, Aeronautical Center, after May 1, 1968.

Distribution: List W-1, Item 30
List F-1, Item 30

8. SPECIAL TOOLS AND EQUIPMENT REQUIRED. Standard station teletypewriter equipment and hand tools.
9. MODIFICATIONS TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Director.
10. WHEN MODIFICATION IS TO BE PERFORMED. During next routine maintenance or as determined by Regional Director.
11. ESTIMATED TIME REQUIRED. Eight man-hours.
12. DISPOSITION OF SURPLUS PARTS. Discard. No economic value.
13. MODIFICATION PROCEDURE. Follow the step-by-step procedure outlined in the Specification (50318S), enclosed with each set of parts.
14. TEST AFTER MODIFICATION. Mount paperwinder in customary position, install full roll of teletypewriter paper and check carefully to ascertain that paper roll weight is now borne by the newly installed disc and associated bearings.
15. RESULT OF MODIFICATION. Excessive wear of the motor reduction gear shaft will be eliminated with consequent reduction in maintenance.
16. CORRECTIONS TO INSTRUCTION BOOKS. None.
17. CORRECTIONS TO INSTALLATION DRAWINGS. None.
18. CORRECTIONS TO RECORDED DATA. Record modification on FAA Form 3353.
19. CORRECTIONS TO TABLE OF CONTENTS. This Chapter will be included in the next revision of the table of contents for this Handbook.

Warren C. Sharp

Warren C. Sharp, Chief
Maintenance Engineering Division
Systems Maintenance Service

March 25, 1968

SUBJ: ELECTRONIC EQUIPMENT HANDBOOK - TELETYPEWRITER

CHAPTER 98. MODIFICATION - TELETYPEWRITER
MU4 MOTOR UNIT AND 82283 MOTOR

(M14-15 EQUIPMENT)

1. PURPOSE. To provide current overload switch protection for MU4 motor unit and 82283 motor.
2. WITHDRAWALS. None.
3. REFERENCES.
 - a. Teletype Corporation Specification 5904S. (Packed with set of parts.)
 - b. Teletype Corporation Bulletin 1147B, parts for motors.
4. BACKGROUND. Early models of the 82283 synchronous motor and MU4 motor units were supplied without current overload protective devices. The 136132 Overload Switch Assembly provides a single heater type, current operated, thermostatic switch overload protector. This supplements but does not replace, the associated equipment set fusing arrangement and branch breaker.
5. APPLICATION. This modification applies to MU4 motor units and 82283 60-cycle synchronous motors now used chiefly on 14XD transmitter distributors, DXD Distortion Test Sets, and CA-406 Tape Operated Distortion Test Sets.
6. MATERIALS REQUIRED. One each, Overload Switch Assembly, Teletype Corporation Part No. 136132, Federal Stock Catalog Number 5815-824-4213.
7. SOURCE OF MATERIALS. Materials to be requisitioned from Supply Management Branch, AC-480.
8. SPECIAL TOOLS AND TEST EQUIPMENT REQUIRED. Standard station teletypewriter equipment and hand tools.
9. MODIFICATION TO BE PERFORMED BY. Field Maintenance Personnel or as determined by the Regional Director.

Distribution: List W-1, Item #30
List F-1, Item #30

10. WHEN MODIFICATION IS TO BE PERFORMED. During next routine maintenance or as determined by Regional Director.
11. ESTIMATED TIME REQUIRED. Eight man-hours.
12. DISPOSITION OF SURPLUS PARTS. None.
13. MODIFICATION PROCEDURE. Follow the step-by-step procedure outlined in the Specification (5094S), enclosed with each set of parts.
14. TEST AFTER MODIFICATION. With equipment in operating position, check that motor functions correctly.
15. RESULT OF MODIFICATION. Current operated, overload protection will be provided for the associated motor.
16. CORRECTIONS TO INSTRUCTION BOOKS. None.
17. CORRECTIONS TO INSTALLATION DRAWINGS. None.
18. CORRECTIONS TO RECORDED DATA. Record modification on FAA Form 3353.
19. CORRECTIONS TO TABLE OF CONTENTS. This Chapter will be included in the next revision of the table of contents for this Handbook.

Warren C. Sharp
for M. M. Martin, Director
Systems Maintenance Service





