35 AUTOMATIC SEND-RECEIVE TELETYPEWRITER SET

DATA COMMUNICATIONS

INSTALLATION

1. GENERAL

1.01 This section is issued to provide complete instructions for installation of 35 Automatic Send-Receive Teletypewriter Sets (ASR) in data communications service. Installation of factory assembled or field assembled ASR sets with either friction feed or sprocket feed typing unit is covered.

1.02 Two basic units are covered in this section. Either unit is normally shipped in two packages. One package contains the typing unit. The other contains the remainder of the ASR components completely assembled and adjusted in the appropriate 35 cabinet. Both units are designed to respond to transmission of standard ASCII (American Standard Code for Information Exchange) signal data. The basic units are both equipped with program control tape readers. One set has an additional rear mounted data tape reader.

1.03 Installation of the two basic units is similar except for signal line connection terminals. This section covers the installation of the equipment to standard 20 or 60 milliampere signal circuits. Connections to parallel signal input from equipment external to the standard sequential signal teletypewriter circuit are not covered here.

2. INSTALLATION

UNPACKING THE EQUIPMENT

2.01 Open shipping cartons carefully. Be sure the carton is resting top side up. Clip any metal strapping. Carefully cut or slit paper tape or fiber carton seals to avoid damage to finished surfaces of the equipment. Remove the inner carton top cap and the "tube" which rests on the pallet and encircles the equipment. Remove and set aside any separately packaged parts, such as the offset copyholder and the lower compartment panel.

2.02 Small components, such as a reader, reperforator, or typing unit, may be lifted with the pallet from the carton. Remove and discard hardware mounting the unit to the pallet.

2.03 When unpacking larger units, such as the cabinet, carefully tip the unit on its back, resting it on a soft surface to prevent scratching. Remove bolts which fasten the feet to the pallet, and remove the pallet.

2.04 Rest the unpacked unit so that it is standing upright. Remove cloth bags or separately packaged cartons taped or tied to the component. These contain mounting hardware and loose parts. Carefully identify these packets with the name of the component from which they were removed. Remove all tape fastening moveable components. Remove any protective wrappings used in packaging the set.

2.05 Remove four shipping screws, washers, lock washers and spacers which fasten the base mounting brackets rigidly to the cradle for shipment.

SET LOCATION

2.06 There should be a clearance of a minimum of 13 inches between the back of the cabinet and a wall to permit opening of the upper cover without striking the wall. A clearance of 3 feet is required for removal of the cover.

FACTORY ASSEMBLED SETS

2.07 Except for installation of the typing unit, factory assembled sets are delivered with all components in place and properly adjusted in the cabinet. Either friction feed or sprocket feed typing units may be installed in factory assembled sets. (See Figure 1.)

2.08 Open or remove the lower cabinet cover. When some components are already in position, as in installation of factory assembled sets, always open the upper cover first, and detent it in a partially open position on its stop arm. Disconnect the copylight plug, if previously installed. Proceed as follows to open or remove the lower cover:

Note: When the cover is open, complete access is provided to the equipment from the top, front, and sides. If access from the rear is desired, it is necessary to remove the cover.

(a) Unfasten the lower cover lock screws in each front corner.

(b) Push rearward on the lower cover latch (under the right front corner of the upper cover) and lift the front of the lower cover with finger grips provided. Raise the cover to its vertical lock position.

Note: The cover weighs approximately 38 pounds.

(c) Close and latch the upper cover. The cover, or "bubble" must be in its detented position whenever the lower cover is opened OR closed.

(d) To remove the lower cover, remove the upper retaining shoulder screw from the right hand stop arm bracket.

(e) Loosen the hinge lock bracket mounting screw, and slide the bracket away from the hinge.

(f) Support the cover from the rear. Remove the acorn type nut from the left upper stop arm stud, and disengage the stop arm from the cover. Supporting the cover from the rear, remove by sliding sideways to separate the hinges.

A. Friction Feed Typing Unit

2.09 Install the typing unit on the base with four mounting screws furnished with the base. See the applicable section for adjustment of typing unit to base. Install paper roll in the typing unit.

B. Sprocket Feed Typing Unit

2.10 Install the sprocket feed typing unit on the base with four mounting screws furnished with the base. See the applicable section for adjustment of typing unit to base.

Note: Install form supply and accumulating shelf and rearward extended pedestal feet on those sets using business forms.

2.11 Install the rear paper guide and form guide and install sprocket feed paper in the typing unit, making certain that paper-out and low paper switch levers rest on top of the paper. See applicable section for form guide adjustments.

C. Cabinet Assembly

2.12 Reinstall the cover, following the reverse of the procedure outlined in paragraph 2.08. Install the offset copyholder at the right side of the cabinet. Install the lower compartment panel by sliding it into place over pivots on each side of the pedestal and fastening at the top by means of push button fasteners.
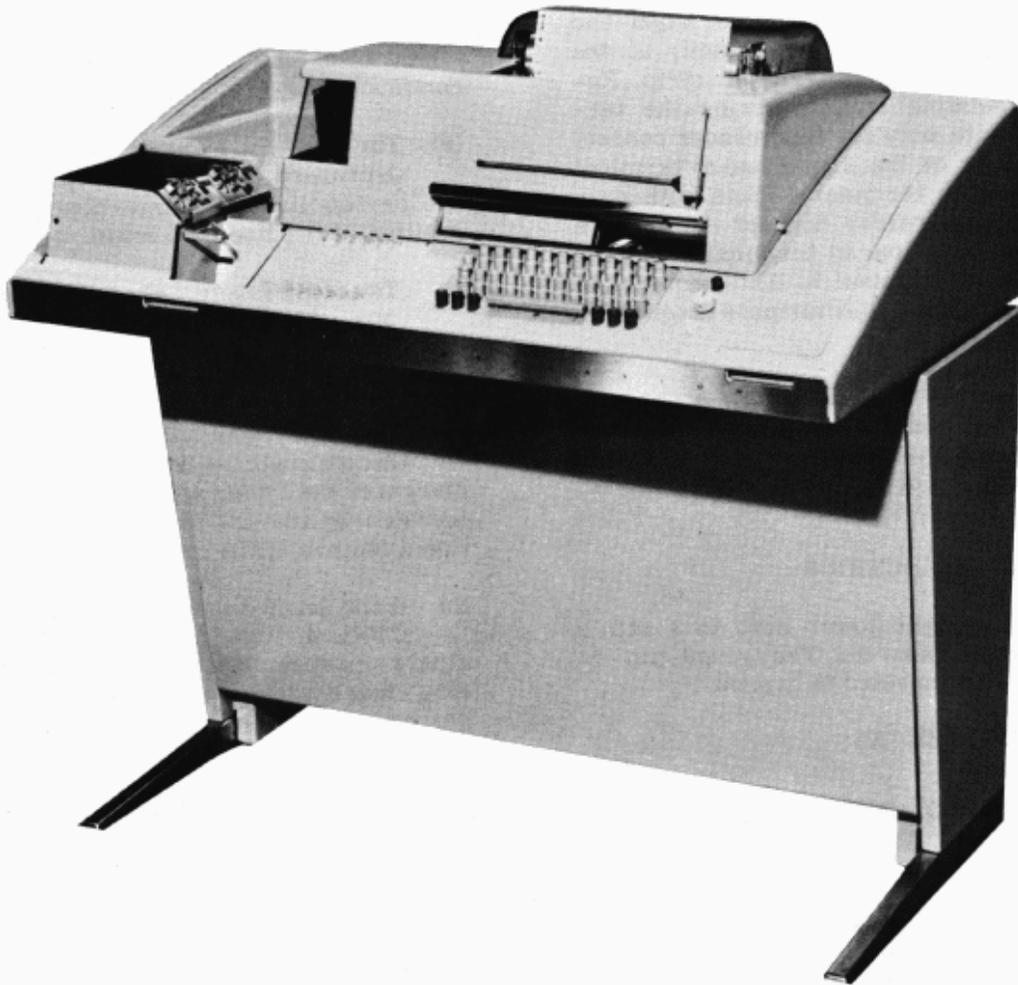
Figure 1 — 35 Automatic Send-Receive Set for Data Communications Service

FIELD ASSEMBLED SETS

2.13 Unpack components and open or remove cabinet cover as outlined above.

2.14 Install gear sets on component bases and mating pinions and motor shafts, and install motors using screws provided with the base. Install bases in the cabinet, and position components on the bases. Install tape reader or readers and typing reperforator. Set the typing unit in place, but do not complete its installation at this time. See the applicable section for necessary adjustment in cradle height.

2.15 Mount the electrical service unit using hardware provided with the unit. Attach ground wires under the cabinet ground screw and at the right rear motor mounting screw.

2.16 Mount control panels, switch bracket and electrical service unit controls.

2.17 Install tape handling components, including tape chute and chad handling parts. See the applicable specifications for adjustments.

2.18 Refer to paragraphs 2.09 through 2.12 for final installation of typing unit and cabinet components.

SIGNAL LINE CONNECTIONS

2.19 Open the lower cover. At the right end of the electrical service unit, at the rear of the cabinet, is a terminal strip. Remove the insulating strip covering the terminals. Sets with only one tape reader connect the positive side of the signal line to terminal 3 and negative to terminal 4. Sets with rear mounted data tape reader connect the positive side of the signal line to terminal 5 and the negative side to terminal 8. This signal line provides a 20 or 60 milliampere sequential signal.

2.20 Consult the wiring diagram for the particular installation and the external requirements of associated data processing equipment for connection of parallel wire signal input.

POWER LINE CONNECTIONS

2.21 Connect the set power cord to a 115 v a c power source. The round pin on the plug must be connected to ground.

3. OPERATING CHECKS

PROGRAM CONTROL OFF

A. Off-Line Tests

3.01 The following operational tests should be made after the set is completely installed, correctly adjusted, and connected to required power supply and signal circuits. Rotate the main power switch to LOC position to start the motors.

(a) Manually depress each key and determine that the proper character is printed or the proper function is performed.

(b) With either of the two shift keys alternately depressed simultaneously with any key which has a graphic symbol in the upper half of the keytop, the correct symbol should be printed on the printed page.

(c) It should be possible to alternately operate any two keys by a "rolling" action. To check this requirement, place a 12 oz weight over a keytop, and alternately release and apply pressure (manually) to another keytop. Each selection should be completed correctly without binding or jamming.

(d) The LOC LF key, when depressed, should cause paper to feed out of the typing unit at approximately three times the speed obtained when REPT and LF keys are depressed continuously.

(e) The LOC S LF key on the LF key, when depressed, should cause paper to feed out one or two lines at a time, depending on the position of the line feed lever.

(f) The REPT key, when depressed with any other key except local function keys, should cause repeated operations in the typing unit.

(g) The CR key, when depressed, should cause the carriage to be returned to the left margin of the typing unit. Automatic line feed initiated by the CR function may be an optional feature of the typing unit.

(h) If the set is so equipped, depressing the CTRL and BELL keys simultaneously, singly or repeatedly, should cause the bell to ring clearly. Sets equipped with only one tape reader are not equipped for the signal bell function.

(i) In sets equipped with only one tape reader, spacing is suppressed on printing of certain foreign language accent marks.

(j) The CTRL key, when depressed with any control function key, should perform the function but should suppress printing and spacing, except in the case of TAB, in the typing unit.

(k) Operation of the CTRL and TAB keys simultaneously should provide horizontal tabbing in the typing unit. Simultaneous operation of the CTRL and VT should provide vertical tabbing. CTRL and FORM keys should provide the form-out function.

(l) The RUBOUT key should provide a non-printing and non-spacing function in the typing unit.

(m) When the REPT and E keys are depressed simultaneously, the end of line indicator lamp, controlled by the margin indicator switch, should light when the typebox carriage has traversed about 72 characters. When the CR key is depressed, the lamp should extinguish.

(n) Operation of the LOC B SP key should cause the reperforator to backspace the tape and the typing unit to backspace the carriage one character each time the key is depressed.

(o) The printer should not type when the ALT MODE key is depressed. The optional non-typing function should occur when operation of the ALT MODE key is followed by the operation of the specific function key.

(p) Operation of the BREAK key for a time interval of 100 or 200 milliseconds, depending on installation option, should cause the BREAK lamp to light and keyboard output to be shunted electrically from the signal line. Depressing the BRK RLS key unblinds the keyboard and extinguishes the lamp.

(q) Depress PUNCH ON pushbutton switch on left end of the lower bank of controls at the left side of the keyboard. The lamp in the pushbutton will illuminate the button. Type a few characters on the keyboard. The characters will be punched in tape with even parity (the eighth bit either marking or spacing, as required to produce a code with an EVEN number of marking bits). The graphics will be typed on the tape. Check all graphics to assure that the proper typewheel is used. Depress the PUNCH OFF pushbutton. The PUNCH ON lamp will extinguish, and the punch will not prepare tape on subsequent traffic.

(r) When the tape reader reads either CR, TAB, VT or FORM code combinations, it should stop reading until the function has been completed.

B. On-Line Tests

3.02 After satisfactory completion of off-line tests above, rotate the main power switch to the ON LINE position. The set motors should operate.

3.03 Connected to a distant station, the tests recommended for LOC operation should be duplicated in ON LINE operation. The local typing unit will monitor transmission.

PROGRAM CONTROL ON

3.04 After satisfactory completion of off-line and on-line tests with the PROGRAM CONTROL switch in OFF position, rotate the main power switch to LOC position. Set motors should operate. Place the PROGRAM CONTROL switch in ON position. The PROGRAM ON lamp lights when the copylights are on.

3.05 Put sample program tape in the program tape reader (rear position) and put sample data tape in data tape reader. The coding of the tapes and the responses are shown in TABLE 1, OPERATING CHECKS, PROGRAM CONTROL.

TABLE 1. OPERATING CHECKS, PROGRAM CONTROL (SHEET 1 OF 3 SHEETS)

PROGRAM TAPE	DATA TAPE (NOTE 1)	PAGE COPY	BY PRO-DUCT TAPE
Text, CR, LF Text, CR, LF LF Text, CR, LF Text, CR, LF Text, CR, LF LF Control P Control A		THE PAIR OF TAPES IN THESE READERS WILL BE USED TO CHECK THE FUNCTIONS OF THIS SET WITH THE INSTRUCTIONS APPEARING ON THE PAGE. THIS FIRST PARAGRAPH SHOULD BE SENT FROM THE PROGRAM READER (REAR) TO THE TYPING UNIT. AFTER THE ASTERISK AT THE END OF THIS PARAGRAPH THE DATA READER (FRONT) SHOULD SEND. *	
	Text, CR, LF Text, CR, LF Text, CR, LF Text, CR, LF LF Control R	THE TYPING UNIT SHOULD BE COPYING TEXT FROM THE DATA (FRONT) READER. NEXT TEST, AUTOMATIC RETURN TO NORMAL CODE BY SENDING THE INTERNAL CODE "PUNCH ON" FROM THE DATA TAPE READER, WHICH SHOULD BE IGNORED BY THE PUNCH (PUNCH SHOULD NOT TURN ON).	
	Text, CR, LF Text, CR, LF Text, CR, LF LF Control Q	THE TYPING UNIT ALONE SHOULD NOW BE COPYING. AFTER THE ASTERISK AT THE END OF THIS PARAGRAPH, TRANSMISSION SHOULD RESUME FROM THE PROGRAM READER. *	
Text, CR, LF Text, CR, LF LF Control P Control R		TEXT SHOULD NOW BE SENT FROM THE PROGRAM READER TO THE TYPING UNIT ONLY. THE NEXT FUNCTION WILL BE UNBLINDING OF THE REPERFORATOR.	
Text, CR, LF Text, CR, LF Text, CR, LF Text, CR, LF		BOTH UNITS SHOULD NOW BE COPYING. THE NEXT FUNCTION WILL BE DATA BYPASS, DURING THIS MODE. BOTH TYPING UNIT AND REPERFORATOR WILL BE BLINDED WHILE DBDBDBDBDB IN THE TAPE PASS THRU THE PROGRAM READER. (CONTINUE CHECKS. SEE SHEET 2 of TABLE.)	Text, CR, LF Text, CR, LF Text, CR, LF Text, CR, LF

NOTE: 1: Applicable only to sets with two tape readers.

TABLE 1. OPERATING CHECKS, PROGRAM CONTROL (SHEET 2 OF 3 SHEETS)

PROGRAM TAPE	DATA TAPE (NOTE 1)	PAGE COPY	BY PRO-DUCT TAPE
Text, CR, LF		SEE THAT LAMP LIGHTS IN DATA BYPASS KEY.	Text, CR, LF
Text, CR, LF		OPERATOR SHOULD DEPRESS DATA BYPASS KEY AS SOON AS UNIT STOPS	Text, CR, LF
Text, CR, LF		SENDING.	Text, CR, LF
Text, CR, LF		WHEN SET STOPS AFTER DATA BYPASS, OPERATOR SHOULD DEPRESS	Text, CR, LF
Text, CR, LF		START KEY.	Text, CR, LF
LF			
Control S			
DBDBDBDBDB			
Control G			
Text, CR, LF		TYPING UNIT AND REPERFORATOR SHOULD BE COPYING.	Text, CR, LF
Text, CR, LF		THE NEXT TEST IS DATA BYPASS WITH MAINTAIN FORMAT WHEREBY BOTH	Text, CR, LF
Text, CR, LF		THE TYPING UNIT AND REPERFORATOR WILL BE BLINDED TO TEXT, BUT	Text, CR, LF
Text, CR, LF		SHOULD FUNCTION AND PERFORATE THREE CAR RET, LINE FEED COM-	Text, CR, LF
Text, CR, LF		BINATIONS. OPERATOR SHOULD DEPRESS DATA BYPASS KEY AS SOON AS	Text, CR, LF
Text, CR, LF		UNIT STOPS SENDING.	Text, CR, LF
Text, CR, LF		WHEN SET STOPS AFTER DATA BYPASS, OPERATOR SHOULD DEPRESS	Text, CR, LF
Text, CR, LF		START KEY.	Text, CR, LF
Control V			
Control S			
DBWF, CR, LF			CR, LF
DBWF, CR, LF			CR, LF
DBWF, CR, LF			CR, LF
Control G			
Text, CR, LF		BOTH THE TYPING UNIT AND REPERFORATOR SHOULD BE COPYING. OPER-	Text, CR, LF
Text, CR, LF		ATOR SHOULD NOW TEST MANUAL BLINDING OF TYPING UNIT BY DEPRESS-	Text, CR, LF
Text, CR, LF		ING PRINT SUPPRESS AS SOON AS UNIT STOPS SENDING. WHEN SET STOPS AFTER	Text, CR, LF
Text, CR, LF		PRINT SUPPRESS OPERATION, OPERATOR SHOULD DEPRESS START KEY.	Text, CR, LF
Control S			
PSPS PSPS PS			PSPS PSPS PS
Control S			
LF			
Text, CR, LF		THE NEXT TEST WILL BE AUTOMATIC PRINT SUPPRESSION WITH "MAIN-	Text, CR, LF
Text, CR, LF		TAIN FORMAT" THE TYPING UNIT WILL BE BLINDED TO TEXT BUT WILL	Text, CR, LF
Text, CR, LF		RESPOND TO THREE CAR RET, LINE FEED COMBINATIONS.	Text, CR, LF
Text, CR, LF			Text, CR, LF
Text, CR, LF			Text, CR, LF
		(CONTINUE CHECKS. SEE SHEET 3 OF TABLE.)	

TABLE 1. OPERATING CHECKS, PROGRAM CONTROL (SHEET 3 OF 3 SHEETS)

PROGRAM TAPE	DATA TAPE (NOTE 1)	PAGE COPY	BY PRO-DUCT TAPE
Control V			
Control U			
PSMF, CR, LF			PSWF, CR, LF
PSMF, CR, LF			PSWF, CR, LF
PSMF, CR, LF			PSWF, CR, LF
Control G			
Control T			
Text, CR, LF		THE TYPING UNIT ALONE SHOULD NOW BE COPYING. NEXT TEST THE	
Text, CR, LF		MANUAL STOP AND STEP. DEPRESS THE STOP KEY. DEPRESS THE STEP	
Text, CR, LF		KEY, THEN DEPRESS THE START KEY NOW. THE STEP KEY SHOULD	
Text, CR, LF		CAUSE ONE CHARACTER TO BE READ.	
Text, CR, LF		THE SET WILL NOW BE SWITCHED TO THE NORMAL CODE, DURING WHICH	
Text, CR, LF		IT SHOULD NOT RECOGNIZE INTERNAL CODES. THIS WILL BE SHOWN BY	
Text, CR, LF	NOTE 2	RINGING SIGNAL BELL. (NOTE 2)	
Control D			
Control G			
Control G			
Control G			
Control U	NOTE 3	THE SET WILL NOW BE SWITCHED TO THE NORMAL CODE DURING WHICH	
Control U		IT SHOULD NOT RECOGNIZE INTERNAL CODES. THIS WILL BE SHOWN BY	
Control U		THE TYPING UNIT'S ABILITY TO COPY AFTER RECEIVING THE PRINT	
Text, CR, LF		SUPPRESS CODE. THE PRINTER SHOULD BE COPYING.	Text, CR, LF

NOTE 1:   Applicable only to sets with two tape readers.
NOTE 2:   Applicable only to sets with two tape readers.
NOTE 3:   Applicable only to sets with one tape reader.