ADDENDUM TO SPECIFICATION 50147S FOR THE 148161 MODIFICATION KIT

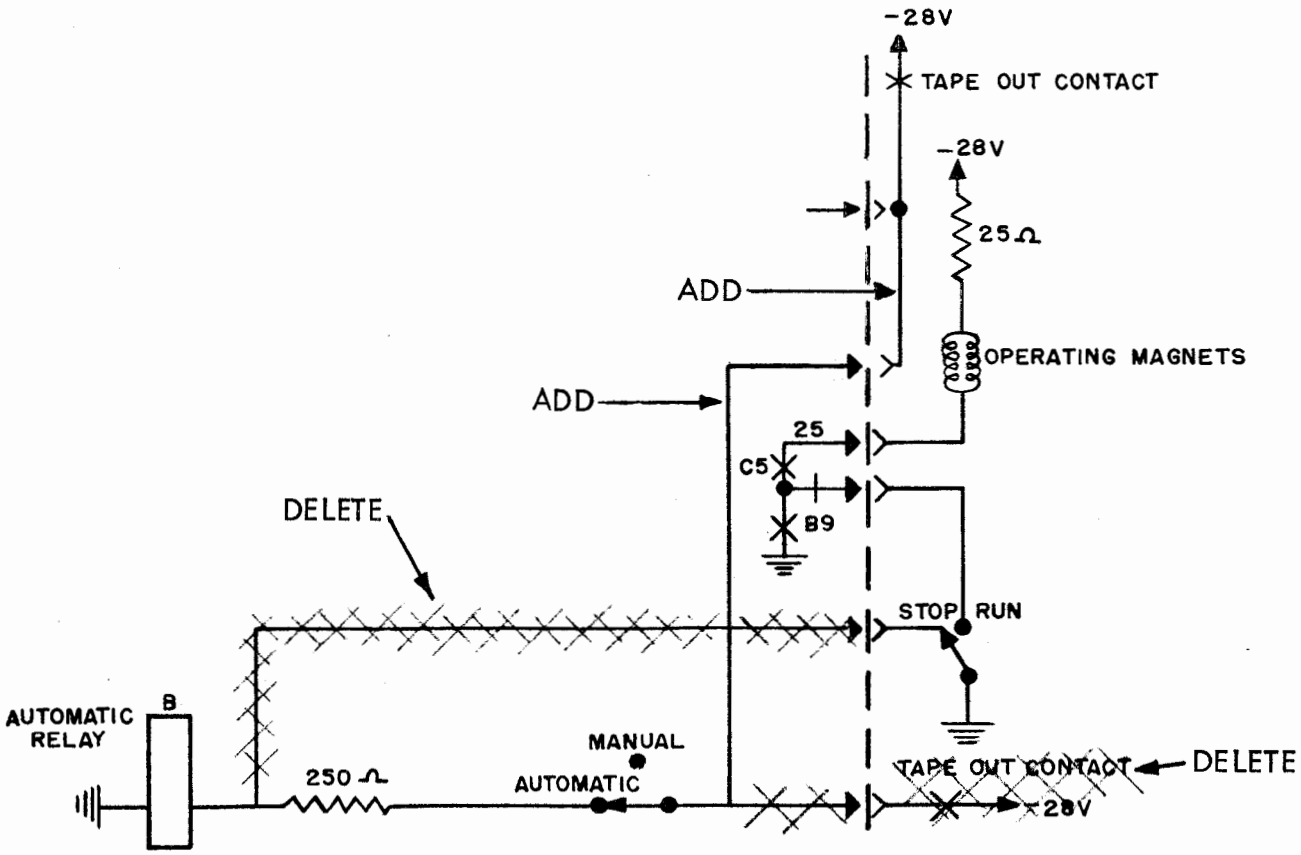
1. Make the following changes in the Specification:

1.1 On page 2 add paragraph 4. which is: Remove (Cut) and tape back wire on Pin 7 of 25 Pin receptacle located on the 148572 Assembly. Note: Disregard this instruction if wire is not present on Pin 7.

1.2 On page 3 change paragraph 3.c.(2) to read as follows: Reader should sense tape when RUN-STOP switch is placed in RUN or STOP position. In STOP condition audible and visible alarms are disabled. RUN condition alarms will be activated at end of tape.

1.3 On Page 3 change paragraph 4.b.(d) to read as follows: Reader RUN-STOP switch control option - in STOP position alarms are disabled. In RUN condition alarms are activated by end of tape and disabled by placing switch in STOP position.

1.4 On Figure 4 make the following changes: Delete wire between 250 ohm resistor and stop side of Reader RUN-STOP switch. Delete connection between automatic-Manual switch and tape-out contact and delete contact notation at bottom of figure. Add connection between automatic switch swinger on bottom of figure to tape contact at top of figure. This lead terminates with one side of Tape-Out contact and C relay. See figure below.



INSTRUCTIONS FOR INSTALLING THE 148161 MODIFICATION KIT TO EQUIP DATASPEED TRANSMITTER FOR INTERIM UNATTENDED ANSWER OPERATION

1. GENERAL

a. The 148161 Modification Kit, when installed, provides circuitry for automatically starting an unattended DATASPEED Transmitting Terminal from a remote station without depending upon the reverse channel carrier signal derived in the data set for this feature.

b. The unattended answer circuit is compatible with the 146527 Line Break and Automatic Answer feature.

c. The 148161 Modification Kit consists of:

1 ft.	31784RM	Wire, Green
1	177543	Board, Circuit (EC543) - Figure 5.

2. INSTALLATION (FIGURES 1 AND 2)

NOTE

To install the 148161 Modification Kit, two procedures are presented depending upon the DATASPEED Units to be modified.

a. If the 146527 Line Break and Automatic Answer Assembly is stamped "AA" adjacent to the test-operate switch, no wiring changes are required. The only modification required is that the 177543 Circuit Board (EC543) be substituted for the 146520 Circuit Board (EC520). See Figure 1. Proceed with test in accordance with Paragraph 3.

b. If the 146527 Line Break and Automatic Answer Assembly is not stamped "AA," wiring changes are required. Proceed with installation of the modification kit as follows:

(1) Unplug the power cord to the cabinet.

(2) Pull the front panel forward so that the 146527 Assembly is accessible. See Figure 1.

(3) Remove Plug "B" and the EC520 Circuit Board.

(4) Remove the two mounting screws that secure the B-C Relay Bracket to the assembly.

(5) Remove the two mounting screws, along with spacers and circuit board guides, that hold the circuit board connector in place.

(6) Orientate the combination B-C Relay and circuit board connector so that the terminals are accessible for removing and adding wires. Exercise care so as to prevent breakage of existing wiring.

(7) Make the following wiring changes. See Figure 2.

(a) On B Relay, remove wires between B(8) and B(11) and between B(8B) and B(12).

(b) Cut two pieces approximately 3 inches long and one piece approximately 6 inches long from the green wire furnished in the kit and strip the ends. Make and solder the following connections.

1. Between B(8M) and pin E of Circuit Board Connector D using one of the three-inch pieces of wire.

2. Between B(8) and terminal 1 of 25 ohm Resistor H using the six-inch piece of wire.

3. Between B(8) and pin R of Circuit Board Connector D using the remaining three-inch piece of wire.

(c) Recheck wiring.

(8) Remount the circuit board connector and the B-C Relay on the 146527 Assembly.

(9) Insert the 177543 Circuit Board (EC543) and make all connections. Plug in the power cord to the cabinet, turn power on and proceed with test in accordance with Paragraph 3.

3. TESTING PROCEDURE

NOTE

To test the unattended modification, a local extension may be used to simulate a receiving station.

a. With conditions set forth in Paragraph 4.b.(1) satisfied, place a call to the transmitting terminal.

b. The operation of the unit should be in accordance with sequence described in Paragraphs 4.b.(2)(b) through (g).

c. If operation is abnormal, proceed as follows. With AUTOMATIC-MANUAL switch in AUTOMATIC position and the OPERATE-TEST switch in TEST position, operation should be as follows:

(1) Motors should start.

(2) Reader should sense tape when RUN-STOP switch is placed in RUN position.

(3) If operation is normal, replace switches to normal and substitute EC543 Circuit Board and repeat test in accordance with Paragraph 3.a. If action is abnormal, check data set output.

NOTE

When data set is in "Data" mode interlock lead should be at +8 volts +1 volt. Also, pins 19 and 20 should be shorted or data set will not remain in "Data" mode.

4. THEORY OF OPERATION (FIGURES 3 AND 4)

a. For subsequent circuit description, refer to Figure 3, Operational Timing, and Figure 4, Circuit Logic Diagram.

b. The following circuit description pertains to automatic answer (unattended operation) of a transmitting terminal.

(1) Conditions for Automatic Start

(a) Power On.

(b) OPERATE-TEST switch in OPERATE position.

(c) Tape in reader (Tape-Out pin actuated).

(d) Reader RUN-STOP switch in RUN position.

(e) AUTOMATIC-MANUAL switch in AUTOMATIC position.

(f) AUTO button on data set depressed.

(2) The sequence of events are as follows:

(a) Receiver terminal operator places call to unattended transmitter terminal in the normal manner.

(b) At the transmitter terminal the data set will automatically answer the incoming call if above conditions are satisfied. After a period of

several seconds a "mark" tone (1200 cps) will be sent by the transmitter data set.

(c) The receiver operator, upon hearing the tone originating at transmitter station, presses data button on data set. This action must take place within 4 seconds after hearing tone. The DATASPEED Receiver is now on line waiting for incoming traffic.

(d) At the transmitter terminal, the data set will automatically answer the incoming call provided the "Ready" and "Remote Control Common" Leads (21 and 20) are short-circuited. This is accomplished by Make Contact, B11; the B Relay is energized via current path from ground through B Relay, 250 ohm resistor, AUTO switch, and tape-out contact.

(e) The data set begins a timing cycle and after several seconds goes into the data mode, and consequently the "Interlock" goes ON and a 0 to +8 +1 volt signal appears on pin 6 of the data set. This signal is applied to pin M of Circuit Board EC543 which turns on a relay driver consisting of Transistors Q4 and Q5. The output of the Relay Driver, K, goes to 0 volt and the Motor Start Relay (K) is energized starting the reader and winder motors.

(f) The output of the relay driver is also applied to a timing circuit consisting of a Unijunction Q1, which starts its time out. After a minimum period of 4.5 seconds or maximum of about 10 seconds, a pulse is applied to Q2, a Silicon Control Rectifier, turning this device on (Contact B8 is closed) and subsequently turning on the output amplifier consisting of Transistor Q3. Output J goes to 0 volt and the Line Break Relay, C, is energized. This action closes Contact C5 and completes a current path from ground via run switch, Contact C5, reader operating magnets, and the 25 ohm resistor to -28 volts. The reader will start sensing tape.

(g) At the end of the tape, the tape-out contact will open causing the B Relay to drop out. Contact B8 opens and Q2 (Silicon Control Rectifier) is turned off which subsequently turns off the output amplifier and J goes to -28 volts de-energizing the line break relay, opening Contact C5, and breaking the current path of the reader operating magnet. The reader will stop sensing tape.

(h) The receiver operator can determine the end of transmission in two ways:

1. Tape reperforator has stopped, therefore no traffic is being transmitted.

2. By visually recognizing characters punched in the tape which may appear at the end of a transmission.

NOTE

In either case, to disconnect, the receiver operator lifts handset, presses TALK button and replaces handset in cradle.

(i) The transmitter dataset will subsequently disconnect and the Interlock Output (6) will go to 0 volt turning off the relay driver. The Motor Start Relay, K is de-energized turning off the reader and winder motors.

(j) The transmitting terminal will not automatically answer any future incoming calls until the tape reader is reloaded with a message tape (tape-out contact closed).

(3) Manual Operation

(a) The transmitter can be operated manually in the normal manner with MANUAL-AUTOMATIC switch in AUTOMATIC condition and data set AUTO button not depressed. When transmitting terminal operator presses the DATA button, there will be a 4.5 to 9 second delay before the reader will start sensing tape.

(b) In the event the customer does not desire further unattended operation of a DATASPEED Transmitting Terminal, the TEST-OPERATE switch may be placed in the TEST position and the AUTOMATIC-MANUAL switch is in MANUAL position. This switch bypasses the EC543 Circuit Board and operates the line break relay. Operation will be normal.

(c) The TEST-OPERATE switch provides a means testing circuit board and data set interface.

c. Special Requirements - To restore unit to work in conjunction with reverse channel carrier, substitute the 146520 (EC520) for the 177543 (EC543) Circuit Board.

* * *

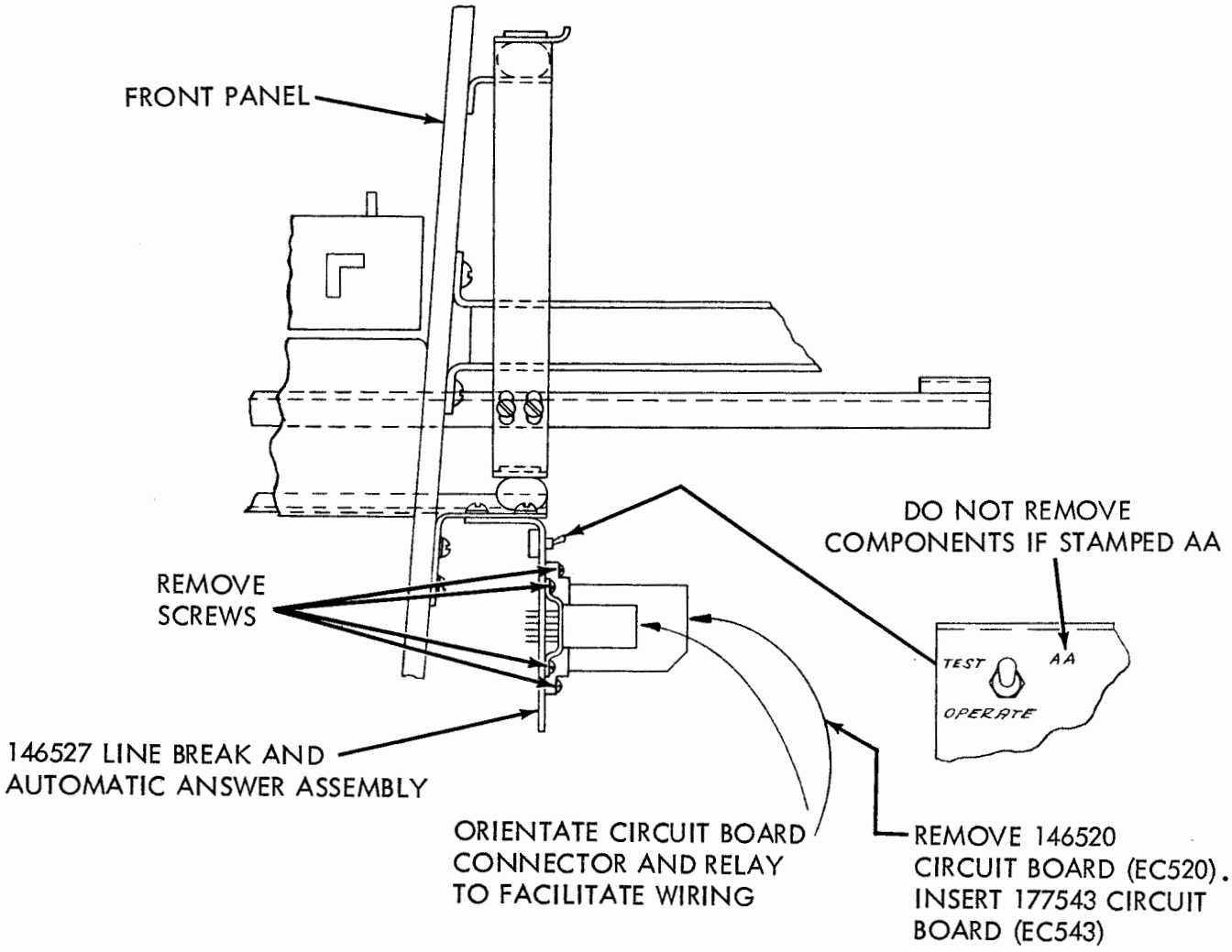

FRONT PANEL
DO NOT REMOVE
COMPONENTS IF STAMPED AA
REMOVE
SCREWS
TEST
AA
OPERATE
146527 LINE BREAK AND
AUTOMATIC ANSWER ASSEMBLY
ORIENTATE CIRCUIT BOARD
CONNECTOR AND RELAY
TO FACILITATE WIRING
REMOVE 146520
CIRCUIT BOARD (EC520).
INSERT 177543 CIRCUIT
BOARD (EC543)

FIGURE 1.

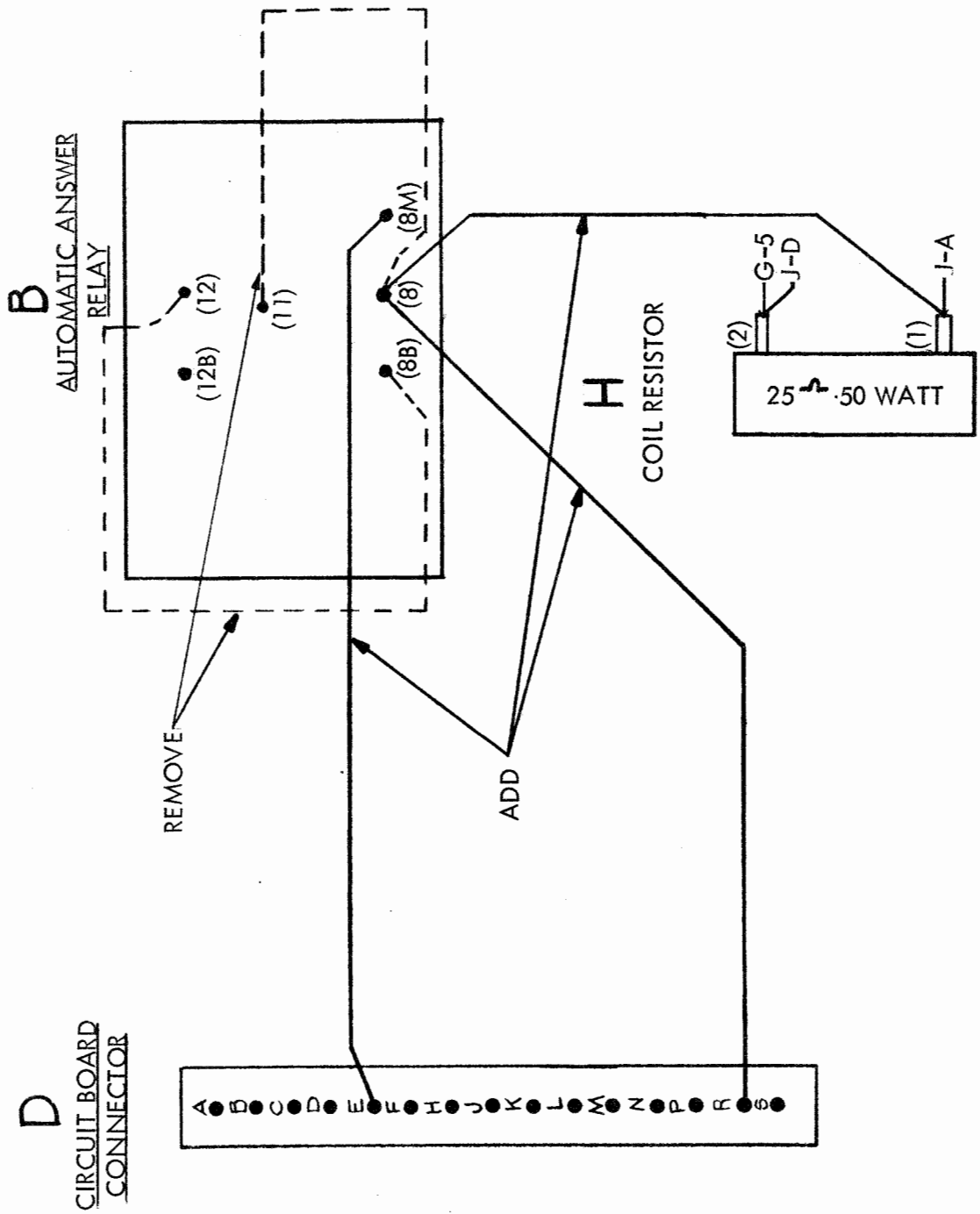

B
AUTOMATIC ANSWER
RELAY
(12)
(12B)
(11)
(8M)
(8)
(8B)
H
COIL RESISTOR
G-5
J-D
J-A
(2)
(1)
25 ~ 50 WATT
REMOVE
ADD
D
CIRCUIT BOARD
CONNECTOR
A B C D E F H J K L M N P R S

FIGURE 2.

OPERATING SEQUENCE
INTERIM UNATTENDED ANSWER

TRANSMITTER STARTING CONDITIONS

1. AUTO Answer Button on Dataset depressed.
2. Reader RUN-STOP Switch in RUN position.
3. Tape In Reader.
4. MANUAL-AUTOMATIC Switch in AUTOMATIC position.

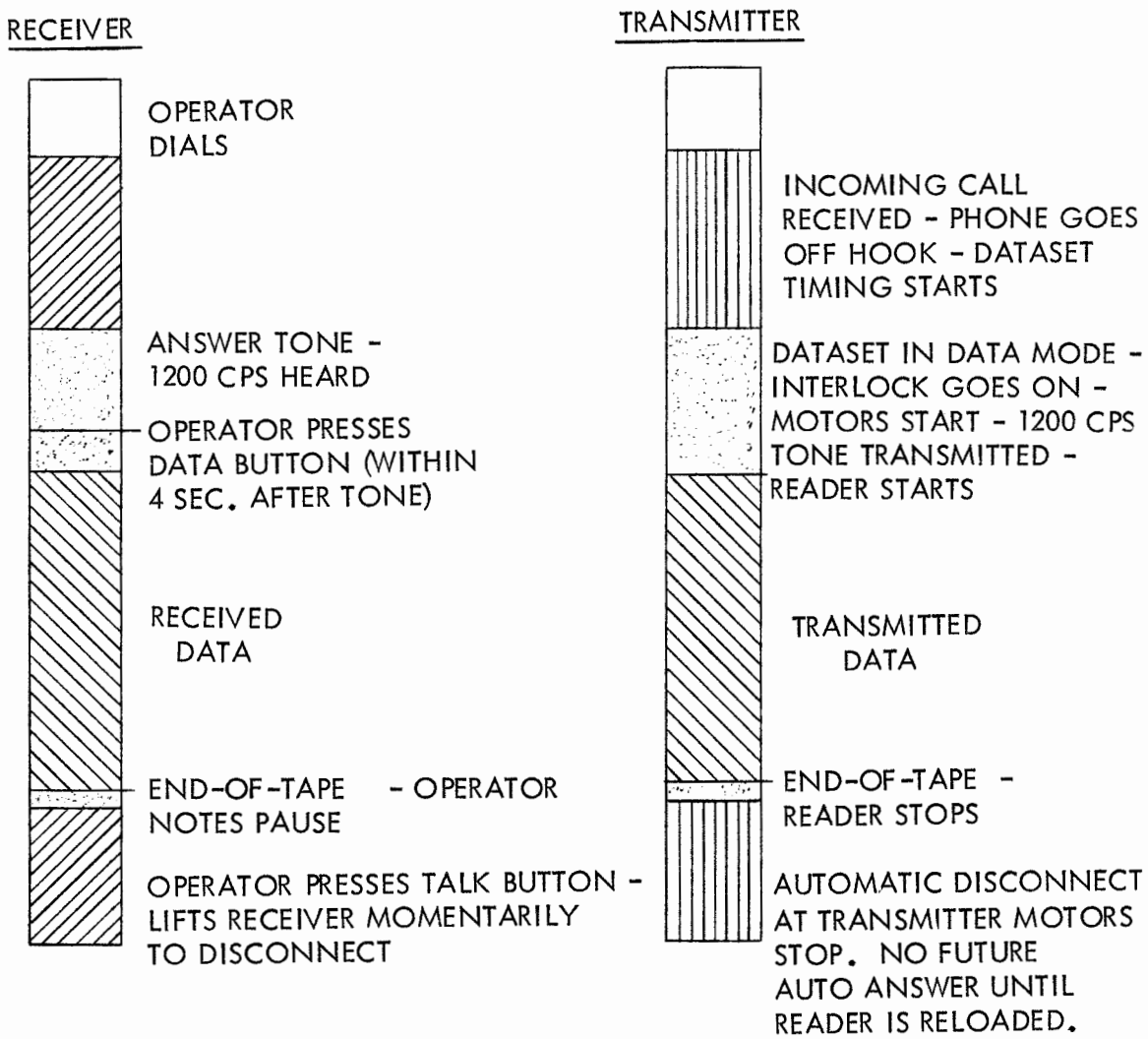


FIGURE 3.

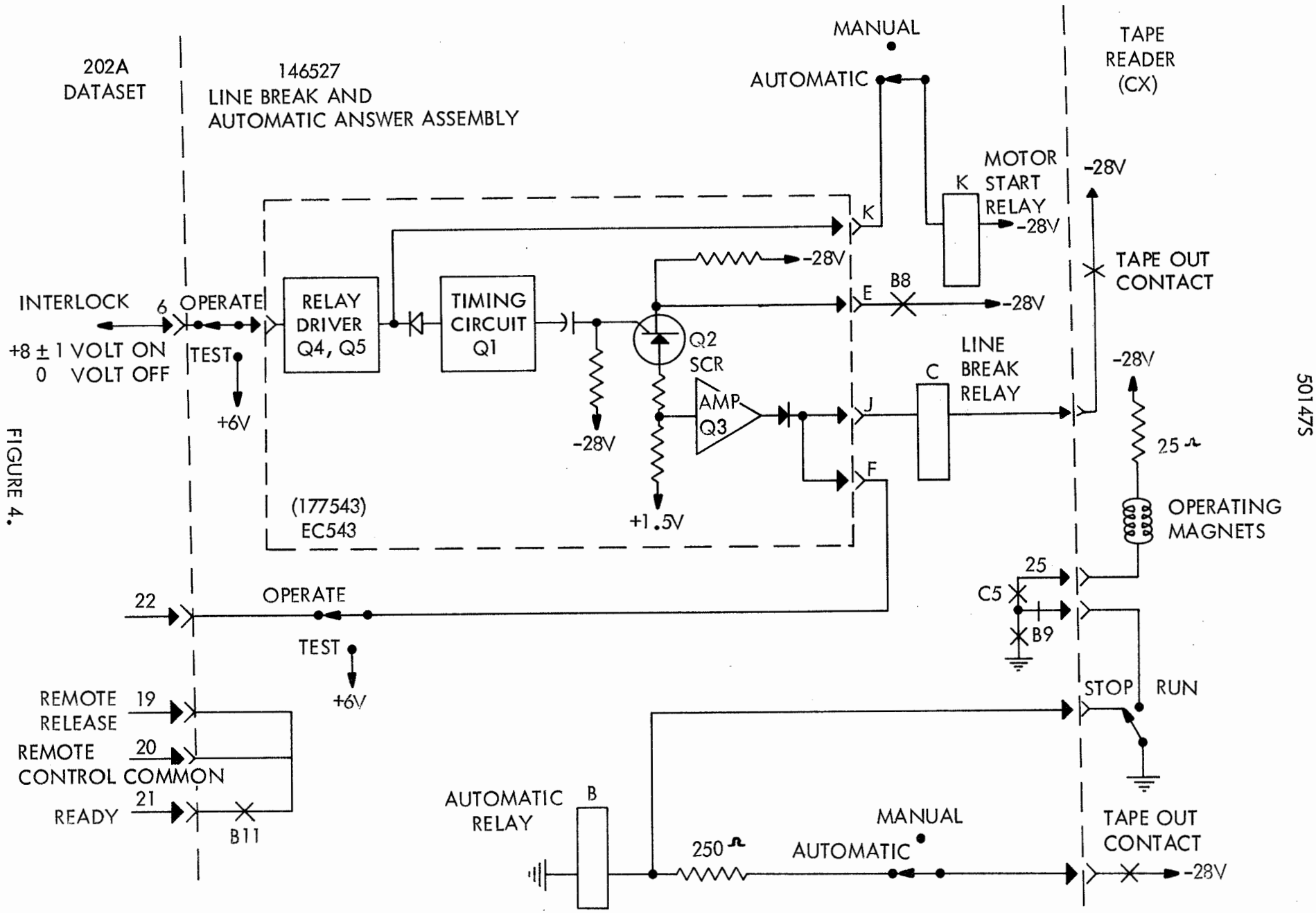
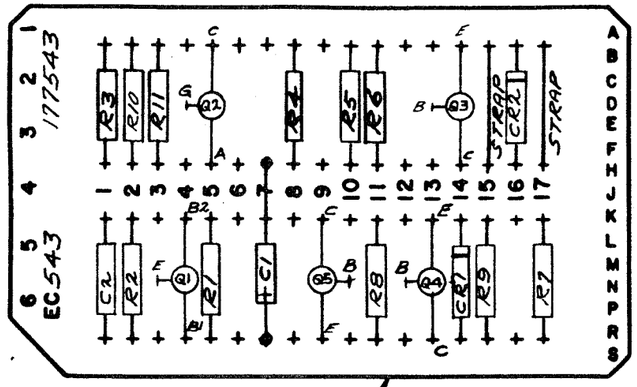
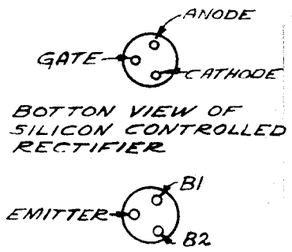


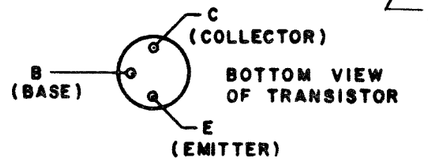
FIGURE 4.

501475

EC







NOTE:
REFER TO 5016WD FOR MARKING INFORMATION

REF. DESIGN	TELETYPE PART NO.	TOTAL QTY.	NAME AND DESCRIPTION	LOCATING FUNCTION
R1	118162	1	Resistor fixed 270K ohms	Timing
R2	137603	1	" " 510 ohms	Base 1 Load
R3	137441	1	" " 1.2 K ohms	Bias
R4	143659	2	" " 560 ohms	Divider
R5	118724	1	" " 220 ohms	Divider
R6	129852	1	" " 2.2 K ohms	Current Limiter
R7	137443	1	" " 1.8 K ohms	Base Bias
R8			Same as R4	Collector Load
R9	118186	1	" " " 5.6 K ohms	Bias
R10	137438	1	" " 100 ohms	Current Limiter
R11	118169	1	" " 1 meg.	Switch by pass
C1	148165	1	Capacitor 22 MF ± 20%	Timing
C2	177107	1	" .1 MF	Coupling
CR1	177108	2	Diode D2	Input Diode
CR2			Same as CR1	
Q1	177610	1	Unijunction	Oscillator
Q2	177100	1	Silicon Controlled Rec. SP1	Switch
Q3	177224	2	Transistor 2N398A	Power
Q4	177105	1	Transistor P22	Amplifier
Q5			Same as Q3	Power
Strap		2	Strap-Bare #24 AWG	
	144495	5	Pad, Transistor	
EC	193155	1	Circuit Card - Etched	

ET-04-67
FC25516-541

50147S

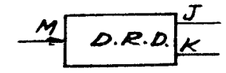
CIRCUIT BOARD EC

177543

ISSUE	DATE	AUTH NO
2	11-2-62	75016
3	12-10-62	75337

TIME DELAY RELAY DRIVER

SYMBOLS

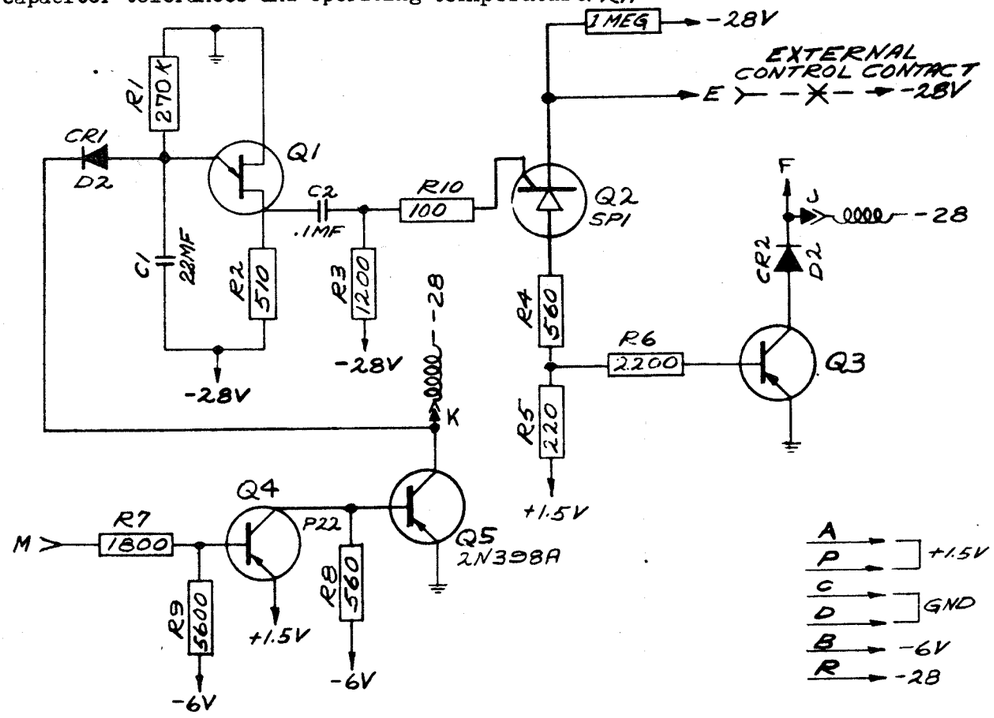


This circuit consists basically of two relay drivers, one of which is operated by a time delay circuit.

In the static or "off" condition, M is at 0 volts or more negative and Q4 is conducting holding Q5 off. Transistor Q5 collector output (K) is connected to a relay biased to -28 volts. Diode CR1 is forward biased and a small amount of current flows from ground via R1, CR1 and relay to -28 volts. Unijunction Q1 and SCR Q2 are off holding Q3 off. Collector load of Q3 is a relay biased to -28 volts.

When a +5 volt signal or greater is applied to input M, Q4 is turned off, Q5 is saturated and output K goes to ground energizing the relay (collector load) and reverse biasing CR1. Capacitor C1 begins to charge toward ground via R1. At some voltage (less than half the voltage across Q1) the unijunction will be triggered discharging C1 via emitter and R2. A positive pulse is applied to C2, SCR (Q2), and the SCR will turn on if the external control contact is closed applying a negative voltage on the base of Q3 switching Q3 on which places 0 volts at output J and the second relay is energized. Q3 will be turned off when SCR is cut off by the opening of external control contact. Q5 is turned off by placing a 0 volt signal or more negative on M input. Output F of Q3 provides lead which permits by-passing the circuit card in its intended application.

The delay of this timer may vary between 4.5 to 8.5 seconds depending upon capacitor tolerances and operating temperature.



NOTE:
CARD CONNECTIONS ARE REPRESENTED BY LETTERS
TEST POINTS ARE REPRESENTED BY NUMBERS

FIGURE 5.

APPROVALS	
D AND R	E OF M
E-NUMBER	
PROD. NO. 177543	
DATE 8-24-62	
P.D. FILE NO. 1-11.13400	
DRAWN	CHK'D
ENG'D. EHP	APP'D

TELETYPE CORPORATION

177543