TELESCRIPT SETS

DESCRIPTION

CONTENTS PAGE

1. GENERAL

1.01 This section is reissued to update the information, to make minor corrections and to transfer information dealing with facilities to BSP Section 596-800-902CA, Issue C. Due to the nature of these changes marginal arrows, ordinarily used to indicate changes and additions, have been omitted.

1.02 The Telescript Set is an electronic analogue device capable of direct transmission of handwriting, sketches or any other form of graphic data involving two co-ordinate positioning. Reproduction is instantaneous from a transmitting unit to a receiving unit, or among several units interconnected in a system. Information can be transmitted over any standard telephone circuit on which the maximum allowable noise or disturbance cannot exceed –54 dBm at a steady state, plus less than 90 counts of impulses during a 30 minute period of a level not over –44 dBm. The transmission will also pass through dial telephone systems.

1.03 Messages to be transmitted are written on Telescript paper by means of a specially designed ball point pen on transmitters or by means of a specially designed stylus on transceivers. The pen is attached to the transmitter by means of a flexible coupling and electrical cord, and the stylus is attached to the transceiver by means of a ball and socket magnetic coupling and electrical cord. The receiver uses a capillary-type pen to record the information with special ink. Paper used on receivers must be compatible with the special ink. Papers are available in plain rolls with or without perforations and in printed forms which may be fan-folded for use in trays.

1.04 The equipment can be supplied with either a friction type feed roll which is used with plain paper, or a feed roll equipped with sprocket pins which permits the use of printed forms or plain paper. A page feed-out is provided, adaptable to form lengths of one and one half inches, two inches, three inches, four inches, six inches and eight inches. The page is six inches wide. The maximum writing area is five inches by three and one half inches for each feed.

1.05 A number of automatic controls and appropriate signal lamps are provided for all models. In the transmitter or transceiver, the transmit-standby switch is automatically controlled by a mercury switch in the pen itself. When the operator raises the pen from its rest or horizontal position in order to write a message, the unit is switched from standby to transmit. In some applications there is no standby.

1.06 An automatic selective lock-out feature is furnished with the transmitters for use where more than one transmitter has access to a common receiver. This lock-out prevents a transmitting station from seizing the line if the line is busy.

1.07 In the receiver, an automatic squelch circuit is provided to minimize response to spurious line noises. Similar devices are furnished with the transceivers.

1.08 Signal lamps are provided on the transmitter and transceiver to indicate power on, transmit or receive conditions, and busy line conditions. The receiver has one lamp which indicates the power-on condition.

1.09 Illustrations and text, in part, courtesy of Victor Comptometer Corporation.

2. PRE-INSTALLATION CHECKS

2.01 Check the following points and adjust if necessary.

2.02 Remove machine from carton and unpack as per packing-unpacking instructions BSP 596-800-902CA; carefully handling pantograph assembly when removing tape and styrofoam blocks.

2.03 After unpacking, check the individual units, receivers, transceivers and transmitters for:

(a) Paper Feed (1½", 2", 3", 4", 6", or 8" depending upon paper feed requirement).

(b) Paper Tension between 5 and 8 oz.

(c) Paper Tear Off, if form paper is to be used.

2.04 With transmitting pen or stylus held at vertical and horizontal center frequency and a 600 ohm terminated audio level meter, HIP 400L or equivalent, connected to output binding posts 1 and 2 on transmitters and binding posts 101 and 102 on transceivers. The signal levels should be as indicated in Table A below.

TABLE A
TRANSMITTER AND TRANSCEIVER OUTPUT SIGNAL LEVELS

	SIGNAL LEVEL		SHUNT TO GND. THRU 1 MFD CAPACITOR	
	MINIMUM SIGNAL LEVEL	MAXIMUM SIGNAL LEVEL	TRANSMITTER	TRANSCEIVER
Horizontal Signal	270 MV	660 MV	25	105
Vertical Signal	270 MV	660 MV	21	104
Composite Signal	380 MV	750 MV	No Shunt	No Shunt

2.05 Connect the receiver or transceiver to a known good transmitting unit. Check for the following:

(a) Skipping at receiver.

(b) Resolution of received copy.

(c) Remote paper feed.

2.06 Be sure you understand the system yourself, not only how to install it, but how it functions, and just what services it will give the customer. It may be advisable to explain the functions of the system to the customer before installation to avoid future misunderstanding. If there is apparent misunderstanding, get in touch with the salesman.

3. POWER REQUIREMENTS

3.01 Telescript Sets operate on 117 volts ±10 percent AC power at a frequency of 60 Hz ±10 percent. The customer is to provide uninterrupted AC power to a standard grounded outlet.

3.02 If the power provided by the customer is regularly or by reason of fluctuations due to load, is outside the range specified above, the customer is to be so informed and advised to arrange for better voltage regulation.

4. CIRCUIT DESCRIPTION

GENERAL

4.01 Writing is a two dimensional method of providing communication and in order to write by wire it is necessary to transmit and receive horizontal and vertical pen motions. A further motion to control the pen contact with the writing surface is required and finally movement of the paper must be co-ordinated at all stations on the circuit. These features, and others, are described in detail below.

Transmitter (Fig. 2)

4.02 In a Telescript transmitter the pen movements are coupled through pantograph linkage to separate but identical position transformers. These transformers have four windings

one of which is movable with relation to the others. The movable winding is coupled mechanically to the pen. One winding is the output take off to the telephone line. The two other windings are part of the oscillator and gating circuit.

Oscillators

4.03 Consider the vertical portion of the oscillator circuit: L1 and C1 are the main frequency determining elements. Transistors Q1 and Q2 produce no phase shift. Winding 1 of the transformer shifts the phase 180° and transistor Q3 shifts the phase a further 180°. Positive feedback is now provided to Q1 and the circuit oscillates. Winding 2 picks up a voltage depending upon its position with relation to windings 1 and 3. This voltage adds to or subtracts from the voltage in the oscillating circuit composed of L1 and C1 and causes a new resonant frequency that depends upon pen position. The amount of change (range) is determined by the variable resistor R1. When winding 2 is electrically centered between windings 1 and 3 no voltage is picked up. A trimmer capacitor across C1 then determines the center frequency.

4.04 A square wave with a value of 25 volts is available at terminal 8 for use with data sets or frequency counters. A sine wave of less than 1 volt is available between terminals 1 and 2 for private line circuits. The horizontal oscillator is identical to the vertical oscillator except that C2 is smaller in order to produce a higher frequency.

Pen Down

4.05 To indicate when the pen is in contact with the paper a pressure sensitive switch in the pen causes relay C to operate. This removes the cut off bias from the modulator diodes and enables 120 cycles from the bridge rectifier to modulate the horizontal position frequency. The balance of modulation is controlled by variable resistor R2. On some models pen down action is prevented during paper feed.

Paper Feed

4.06 When a fresh writing surface is required the pen is moved to the upper left hand corner of the writing area. Mechanical action then causes the closure of the over drive switch S4. Capacitors are added to the vertical and horizontal oscillators reducing their frequencies. This ensures that receiving pens will take positive paper feed action. S3 enables paper feed relay D to start the paper feed motor.

Lock-Out

4.07 When the pen is picked up a mercury switch operates relay A which lights the send lamp signal and enables the vertical and horizontal oscillators. If, however, the system is busy, Telescript signals on the line, (terminals 1 and 4) tuned by transformers T4 and T5 and amplified by Q4 and Q5 will cause lock-out relay B to operate. This lights the busy lamp signal and prevents operation of relay A. Lock-out amplifier sensitivity is controlled by variable resistor R3. When the lock-out is not required it may be removed provided terminals 17 and 19 are strapped. Line terminals then become 1 and 2.

Miscellaneous

4.08 Ground on transmitter terminals 25 or 21 will suppress the vertical or horizontal frequencies. This device is used on DATAPHONE service to provide end-of-message signals and may be used on private line service for station selection or other purposes. The contacts of relay C light the busy signal to indicate adequate pen pressure when writing.

RECEIVER (Previous to Code 011, Fig. 3)

4.09 In a Telescript receiver the pen is coupled through pantograph linkage to two separate but identical pen motors which operate on the same principle as a zero center voltmeter. On each pen motor shaft there is a position transformer similar to those found in the Telescript transmitters. One winding is not used.

Drive Amplifier

4.10 Consider the horizontal position of the circuit: the band pass filter separates the band 2060 to 2340 cps from other frequencies and noise and applies this signal to the amplifier limiter Q1 and Q2. The square wave output is filtered by C1, L1, C2 and the discriminator transformer T1. It is applied to transistors Q3 and Q4 which act as switches. Part of the dis-

criminator output is applied to the position transformer rotor, tuned by L2 and C3, amplified by Q5 and Q6 and gated by Q7. If the resonant frequency of the position transformer is the same as the incoming frequency, Q3 and Q4 receive equal drive current and the pen motor receives no drive current. When the frequencies are different the pen motor receives current until the position transformer is resonant. A trimmer capacitor across C3 determines the center frequency. Variable resistor R1 determines the range. R2 may be adjusted for optimum clarity by damping the pen movements of fast writers.

Servo Amplifier

4.11 The output of the discriminator is clamped by diodes to an adjustable resistor R3 to permit setting the current through the power transistors Q8 and Q9 to a specified level (–6.3 volts). The 2200 cps component of the discriminator output is minimized by filters composed of L3, L4, C4 and C5. Variable resistor R4 is used to position the pen in the absence of signal.

Pen Down

4.12 Transformer T2 and capacitor C6 are tuned to absorb the 120 cps component and prevent pen ripple. When this frequency is present in the horizontal signal Q10 operates the pen relay and the pen solenoid causes the pen to contact the paper. Variable resistor R5 is used to adjust the pen sensitivity.

Squelch

4.13 The vertical amplifier action is the same as the horizontal action. With no vertical input from the filter, the discriminator transistors are biased to cut-off and the potential across the squelch relay drops to a minimum. Each drive amplifier is short circuited and pen movement is prevented. When a vertical signal appears at the discriminator a "push-push" action, instead of "push-pull" action causes 6.3 volts to develop across the squelch relay which then operates to remove the short circuits.

Paper Feed

4.14 When the receiver pen is moved to the upper left hand corner under the influence of signals from a transmitter, mechanical action will close switch S1. When motor starts, a cam action closes switch S2 until one cycle of paper feed is completed. S3 enables local paper feed when needed.

CODE 011 RECEIVER

4.15 The basic theory of operation of the latest code receiver is the same as that of the receiver previously described. The Code 011 Receiver Circuit has been redesigned so that the circuit is similar to receive mode of the transceiver (see transceiver below) in order to standardize components for receiver and transceiver.

END OF MESSAGE UNIT

4.16 When Data Phones are used end of message units are required to ensure disconnection of the distant station.

Transmitter

4.17 When Telescript set is on, relay A operates because Q1 is biased to cut-off. At end of message button is depressed momentarily and relay C operates to charge the 250MF capacitor. Relay C ground the pen circuit which starts both H and V oscillators and grounds the H gate circuit to prevent horizontal frequencies from being transmitted. On release of the end of message button relay B operates momentarily from the energy stored in the 250MF capacitor. Relay B opens the holding loop to the data set which releases the connection.

Receiver

4.18 When Telescript Set is turned on relay A operates because Q1 is biased to cut-off. Voltages at V and H are equal during message reception. When end of message button, at transmitting station is depressed the H voltage will drop allowing Q1 to conduct. Relay A releases opening the holding loop to the data set which releases the connection.

TRANSCEIVER

4.19 Since basic theory of operation of the transceiver is the same as that of the transmitter and of the receiver, the following paragraphs should be adequate to cover the transceiver.

4.20 The transceiver provides both transmitting and receiving functions in the same unit. Aside from the necessary switching functions which are performed both by relay contacts and by the use of biased diode circuits, functional differences from the receiver circuit and transmitter circuit are minor. The transmited output is through audio filters rather than from the position transformers. A busy light indicates the presence of an incoming signal. While receiving a signal, it is impossible to break in and transmit even though the pen stylus is raised.

4.21 A simplified power supply is used in which the –40 volt and –22 volt points have been eliminated. Circuits formerly returned to either of these points now return to –25 volts. Circuits formerly returned to –11 volts now return to –16 volts. A squelch circuit having a long time delay is provided for less sensitivity to noise pulses on the signal line (in the absence of signal). 115V AC output for use of accessories is provided in a separable connector. Fuses have been moved to an extension of the output terminal board for easier access.

4.22 Added circuit elements required for the transmit mode are: a modulator circuit, a paper feed relay circuit which provides a time delay when transmitting, (no time delay when receiving) and provision to energize the pen solenoid when the stylus is pressed in transmit mode writing. Stylus pressure is exerted against a glass plate when transmitting.

4.23 Care should be taken to replace the stylus in its holder on the upper right side of the case after transmitting. Modes are controlled by a mecury switch inside the stylus assembly. The mecury switch controls relay RY-2.

Receiver Circuit Squelch

4.24 Transceiver squelch relay RY-1 is normally energized during transmit and standby modes. Relay is de-energized during receive mode only.

Adjustments

4.25 Range adjustment in the transmit mode is considerably affected by the load present on the output terminals 101 and 102. The receive mode is not affected. Transmit mode is affected because the audio filter introduces reactive phase shift into the regenerative feed back path.

4.26 The transceiver is not intended to replace a transmitter and receiver for full duplex operation. It is limited to only one mode at a time, either transmit or receive.

4.27 All adjustments (except center frequency on older models) are accessible from front of unit with cover removed.

4.28 Bias reading may be taken at the rear side of the unit, at binding post terminal 122 for vertical and 124 for horizontal bias. Bias should read –6.3V DC.

4.29 **If not already done,** to minimize load effect on transceiver range, connect a 3.3k resistor across terminals 111 to 103, and a 3.3k resistor across terminals 112 to 103. These resistors should be soldered to the rear side of the Binding Post Terminal Board and left permanently on the transceiver. This will make the transceiver output level approximately the same as the output of the Transmitter level, and will reduce receive mode sensitivity about 2 db. In addition, for best range accuracy, when ranging unit in shop, connect a receiver or transceiver across the output terminals. When using a Data Set, ranging should be done with a Data Set as the load for best accuracy.

4.30 In ranging, the frequency counter is operated by connecting it through the T-542. Test Set to the signal line terminals, Nos. 101 and 102. For horizontal frequencies the test set is placed at Horizontal Filter and for vertical frequencies the test set is placed at Vertical Filter.

4.31 Center frequency adjustments are made through the base of the unit. Four trimmer capacitors are located about midpoint toward left side of base. The trimmer on the left and toward the rear is used when adjusting Horizontal Transmit. The Trimmer on the left and toward the front is used when adjusting Vertical Transmit. The trimmer on the right and toward the rear is used when adjusting Horizontal Receive. The trimmer on the right and toward the front is used when adjusting Vertical Receive.

4.32 Transceivers should be adjusted in the transmit mode first using the range controls located on the front right side of the unit and the transmit trimmers. When adjusting trimmers in the receive mode **DO NOT** readjust range controls.

5. TECHNICAL DESCRIPTIONS

5.01 Telescript Sets are designed and manufactured to meet the requirements listed in the following paragraphs.

5.02 MODELS:

28 Transceiver, Sprocket with Dual Filter

29 Transceiver, Friction with Dual Filter

(1) DIMENSIONS:

Width	9½"
Length	14-5/16"
Height, front	5½"
Height, rear	6½"

WEIGHT:

Net	28 lbs.
Packaged (Domestic)	33 lbs.

(2) AVAILABLE WRITING SURFACE: 5" horizontal x 3½" vertical

(3) OPERATIONAL TEMPERATURE RANGE (AMBIENT): 10° to 140° F.

(4) POWER SOURCE: 105-125 volts, 60 cps.

(5) POWER CONSUMPTION:
.2 amp standby
1 amp peak load on paper feed function.

(6) FREQUENCIES:
Vertical — 1310 to 1490 cps (sine wave)
Horizontal — 2060 to 2340 cps (sine wave)

(7) FREQUENCY SHIFT:
- One cps frequency shift causes
- 0.021" movement horizontally, and
- 0.025" pen movement vertically

(8) IMPEDANCE CHARACTERISTICS (TRANSMIT OR RECEIVE MODE):
- Approximately 600 ohms from 1310 to 1490 cps and also from 2060 to 2340 cps; high impedance at other frequencies. A 1200 ohm resistor, ½ watt, ±10% may be shunted across the Transceiver to limit maximum impedance.
- The above impedance values exist across signal line terminals, Nos. 101 and 102 whether or not the unit is active, and whether the ac power switch is on or off.
- The Transceiver is connected to the signal line through an isolated winding.

(9) TRANSMITTED SIGNAL LEVELS (TRANSMIT MODE):
- 380 to 750 mv nominal into a 600 ohm load (.3 dBm plus or minus 3 dB) with pen at vertical and horizontal center.

(10) RANGE OF INPUT SIGNAL (RECEIVE MODE):
- 10 mv to 2.5 volt composite signals (measured through an audio filter to reject non-Telescript signal components such as noise and 60 cps modulation) or –38 to +10 dBm.

(11) REGISTRATION ON RULED PAPER: ± 3/32"

(12) STABILITY (PEN DISPLACEMENT):
- Power Line Variation 105-125 volts, ± 1/32"
- Input Signal as Receiver 5 mv to 600 mv (ie .6v) ± 1/32"
- The centre frequency may be readjusted to meet any fixed set of conditions within the foregoing limits.

(13) SIGNAL LINE CHARACTERISTICS:
- Maximum line frequency response deviation in either band (1310-1490 cps or 2060-2340 cps) 3 db.
- Maximum line frequency response deviation between the two bands, 25 dB.

5.03 MODELS:

24 Receiver, Sprocket with Dual Filter

25 Receiver, Friction with Dual Filter

(1) DIMENSIONS:

Width	9½"
Length	14-5/16"
Height, front	5"
Height, rear	6"

WEIGHT:

Net	27 lbs.
Packaged (Domestic)	32 lbs.

(2) AVAILABLE WRITING SURFACE:
5″ horizontal x 3½″ vertical

(3) OPERATIONAL TEMPERATURE RANGE (AMBIENT): 10° to 140° F.

(4) POWER SOURCE: 105-125 volts, 60 cps.

(5) POWER CONSUMPTION:
.2 amp standby
1 amp peak load on paper feed function.

(6) FREQUENCIES:
Vertical — 1310 to 1490 cps (sine wave)
Horizontal — 2060 to 2340 cps (sine wave)

(7) FREQUENCY SHIFT:
- One cps frequency shift causes
- 0.021″ pen movement horizontally, and
- 0.025″ pen movement vertically

(8) IMPEDANCE CHARACTERISTICS:
- Receiver — approximately 600 ohms from 1310 to 1490 cps and also from 2060 to 2340 cps; high impedance at other frequencies. A 1200 ohm resistor, ½ Watt ± 10% may be shunted across the Receiver to limit — maximum impedance.
- The above impedance values exist across signal line terminals, Nos. 1 and 2 in the Receiver whether or not the unit is active, and whether the AC power switch is on or off.
- The Receiver is connected to the signal line through an isolated winding.

(9) RANGE OF RECEIVER INPUT SIGNAL:
- 10 mv to 2.5 volt composite signals (measured through an audio filter to reject non-Telescript signal components such as noise and 60 cps modulation) or –38 to + 10 dbm.

(10) REGISTRATION ON RULED PAPER: ± 3/32″

(11) STABILITY (PEN DISPLACEMENT):
- Input Signal as receiver 5 mv to 600mv (.6v) ± 1/32″
- Power Line Variation 105-125 volts, ± 1/32″
- The centre frequency may be readjusted to meet any fixed set of conditions within the foregoing limits.

(12) SIGNAL LINE CHARACTERISTICS:
- Maximum line frequency response deviation in either band (1310-1490 cps or 2060-2340 cps) 3 dB.
- Maximum line frequency response deviation between the two bands, 25 dB.

5.04 MODELS:
20 Transmitter, Sprocket
21 Transmitter, Friction

(1) DIMENSIONS:

Width	9½″
Length	14-5/16″
Height, front	5″
Height, rear	6″

WEIGHT:

Net	20 lbs.
Packaged (Domestic)	25 lbs.

(2) AVAILABLE WRITING SURFACE:
5″ horizontal x 3½″ vertical

(3) OPERATIONAL TEMPERATURE RANGE (AMBIENT): 10° to 140° F.

(4) POWER SOURCE: 105-125 volts, 60 cps.

(5) POWER CONSUMPTION:
.2 amp standby
1 amp peak load on paper feed function.

(6) FREQUENCIES:
Vertical — 1310 to 1490 cps (sine wave)
Horizontal — 2060 to 2340 cps (sine wave)

(7) FREQUENCY SHIFT:
- One cps frequency shift is caused by
- 0.021″ pen movement horizontally, and
- 0.025″ pen movement vertically

(8) IMPEDANCE CHARACTERISTICS:

- Transmitter alone — approximately 500 ohms resistive from 300 to 3000 cps
- Lockout Amplifier alone — appears as 0.22 mf capacitance 0.02 henry inductance in parallel. This approximates 900 ohms at 2200 cps and 200 ohms at 1400 cps.
- The above impedance values exist across signal line terminals, Nos. 1 and 4 in the transmitter whether or not the unit is active, and whether the AC power switch is on or off.
- The transmitter and lockout amplifier are all connected to the signal line through isolated windings. Only one of these impedances, Transmitter, or lockout amplifier, is presented to the signal line at any one time.

(9) TRANSMITTED SIGNAL LEVEL:

- 760 to 1020 millivolts (production tolerance) into an open circuit. This provides 380 to 750 mv into a 600 ohm load. (.3 dBm plus or minus 3 dB). At vertical and horizontal center frequency.

(10) LOCKOUT AMPLIFIER SENSITIVITY:

- 35 mv composite signal (25 mv 2200 cps components)

(11) STABILITY:

- Power line variation 105-125 volts, ± 1/32″
- The center frequency may be readjusted to meet any fixed set of conditions within the foregoing limits.

(12) SIGNAL LINE CHARACTERISTICS:

- Maximum line frequency response deviation in either band (1310-1490 cps or 2060-2340 cps) 3 dB.
- Maximum line frequency response deviation between the two bands, 25 dB.

6. INTRODUCTION TO SYSTEMS APPLICATIONS

GENERAL

6.01 The application of Telescript equipment to communication networks and systems utilizes built-in "add to" features not normally associated with the transcribing functions of the units.

6.02 The current units of the series differ from those of earlier manufacture, only in wiring arrangement changes to increase the adaptability of the units to a wider range of applications without the necessity on the part of the installer to make field wiring changes within the units. Also, component changes provided an increased performance level and extended the maintenance interval.

6.03 Functionally, the Telescript, Transceivers, Transmitters and Receivers of current manufacture are the same as the earliest units. Interchangeability of sets in a wide range of applications is accepted practice. The only exceptions are the economics to adapt certain codes of equipment to complex systems and applications where signals are subjected to extreme attenuation due to multiple station arrangements and signal lines.

6.04 Consistent with service order requirements, equipment is utilized in various combinations, namely:

- Alternate Voice/Write Systems
- Send-Only stations
- Receive-Ouly stations
- Simultaneous Send-Receive stations
- Alternate Send-Receive stations

6.05 The selection of Telescript equipment for a particular application depends on the following:

Signal level available to:

- Receiver — 10 millivolts
- Lockout Amplifier in transmitter at send-only station — 35 millivolts composite signal (25mv — 2200 Hz. component)
- Transmitter signal level output into a 601A Data Set in a Voice/Writer System
- Receiver connections into a 601A Data Set in a Voice/Write System

6.06 Telescript, Transmitters, Receivers and Transceivers have been adapted to encompass most of the problems of signal attenuation without the necessity of assistance from external amplifiers or repeaters. Thus, the terms "On Premise" and "Off Premise" are used to establish the series applicable to a variety of networks and systems.

6.07 Normally, an "On Premise" network or system is one in which all equipment is located within a plant, and the signal attenuation due to signal lines is negligible.

6.08 An "Off Premise" network or system is one in which equipment is dispersed in a metropolitan area or in a large area installation. An example of a large area installation is an airport. Telescript stations may be a few hundred feet apart, but the signal line routing establishes a distance between stations as miles apart. Also, a majority of stations may located at one central location and several stations may be located elsewhere in a metropolitan area. The Service Order attachment will give the locations of all stations on a system.

BASIC CIRCUITS UTILIZED IN TELESCRIPT APPLICATIONS

6.09 Applications auxiliary to the transcribing functions of the Telescript Set are activated by utilizing circuits and potentials available within the transmitter, transceiver and receiver and do not require any basic wiring changes.

6.10 External terminal boards on all units provide access to the required circuits without the need for disturbing the internal wiring: similarly, the standard internal 22-terminal connector in the transmitter lends itself to a variety of applications through the use of appropriate circuit boards.

6.11 Source of energy and control within the basic units that may be used for auxiliary applications as follows:

(a) External terminals are available on all sets to supply 115vac in its steady state or in-time with the paper feed function. The 115vac is required for Paper Winder motors but may be used for other purposes.

(b) The 5.5v AC is readily available for indicating lamps of a limited number without the use of a subsidiary transformer.

(c) Approximately 40vdc is present on both the transmitter and receiver and approximately 30vdc on the transceiver. These potentials may be drawn upon for a variety of circuits, especially those which include relays, transistors, tuned circuits, dc signal paths, etc. Currents should not exceed .040 amps for transmitters or receivers or .100 amps for transceivers.

(d) One set of contacts on relay TY1 in the Transmitter is brought out to terminals 9, 13 and 14 which are utilized in most applications where the mercury switch in the transmitter pen exercises an influence. These terminals are used mostly with the lock-out feature. Also in this area, additional terminals 17 and 19 may be added in series with the mercury pen circuit to permit transmitter lockout to be applied from a separate control point.

6.12 The standard 22-terminal connector within the transmitter may accommodate the Lockout Amplifier, or an Applique Circuit Board, depending upon applied operating and control techniques. Typical applique circuits and descriptions may be found in BSP 596-800-903CA. It will be observed that certain leads from the connector are brought to the external terminal board. A cable may connect from the transmitter to the receiver or to auxiliary units and permit these units to co-act in the performance of the required functions.

6.13 The transmitter output tones are taken in sine-wave form, from terminals 1 and 4 in all cases except where a Data-Phone subset is used. When the Data Phone subset 601A is used, the outputs are taken in square wave form, from terminals 7 and 8 in order to take advantage of a higher energy level. After passing through the subset the tones become sine waves.

6.14 Circuits of the pen positioning motor networks are brought to terminals 5 and 9 on the receiver. A voltage differential appears at these terminals when the influence of one tone or the other is removed from the receiver loops. The dc potential at these terminals is used to bias transistors in a variety of circuits. End of message unit gives a practical example.

6.15 Terminals 13 and 14 are associated with the squelch relay contacts and enable it to control auxiliary circuits. Applications involving their uses are described in BSP 596-800-903CA.

6.16 Input tone is delivered to terminals 1 and 2 on the receiver in all cases except where a Data Phone subset is used. When the 601A Data Set is used, the message line is connected to terminals 4 and 6 in order to bypass the band-pass filters in the receiver since the Data Phone subset incorporates corresponding filters.

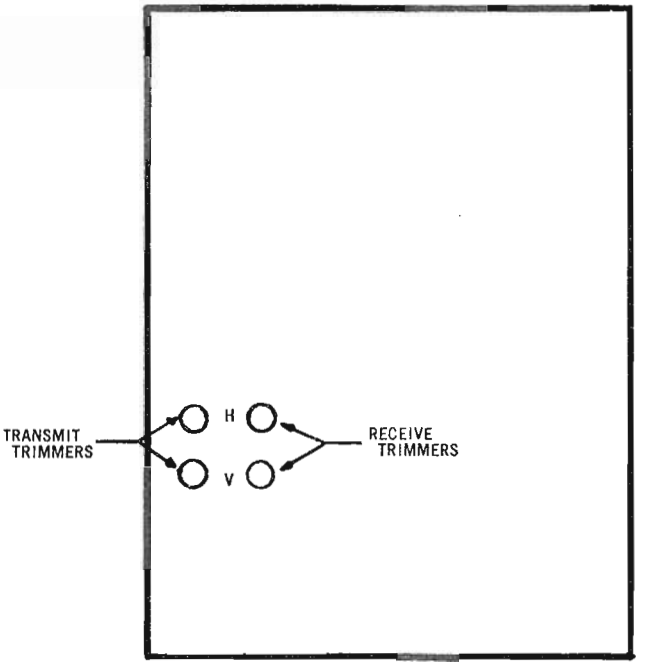

Fig. 1 — Location of Trimmers as Viewed From the Top of Transceiver (Older Model)

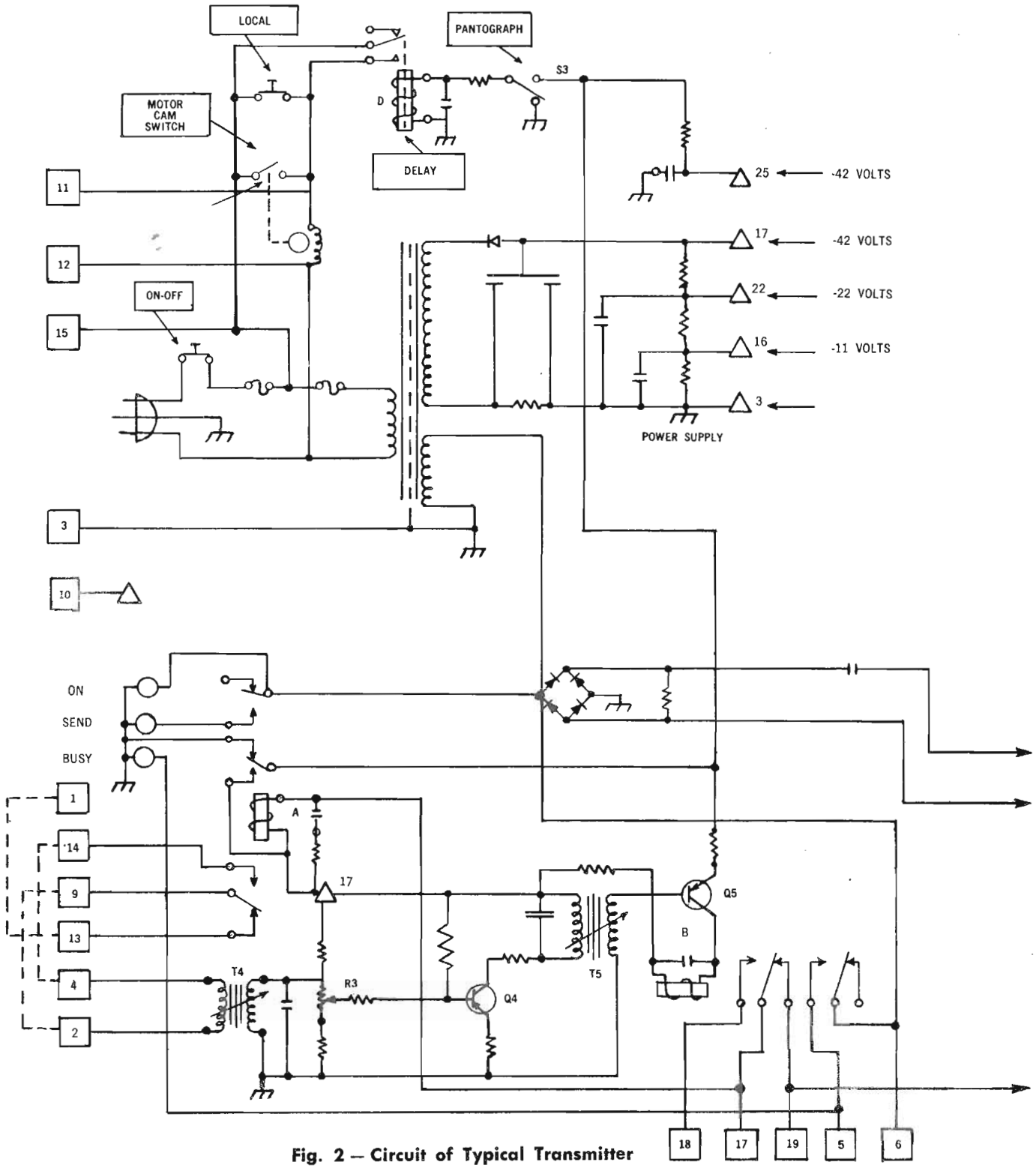

Fig. 2 — Circuit of Typical Transmitter

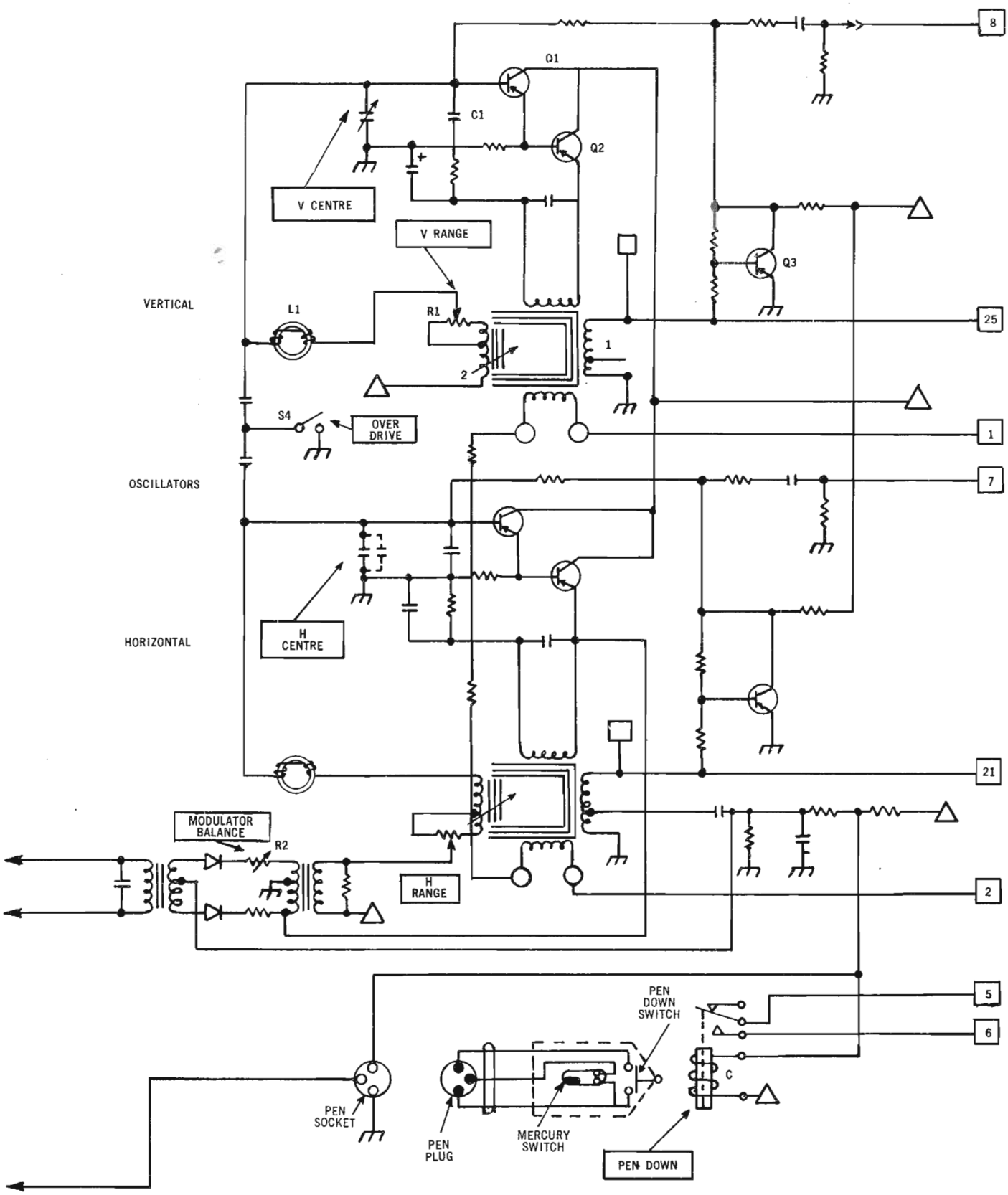

Fig. 2 (Cont'd) — Circuit of Typical Transmitter

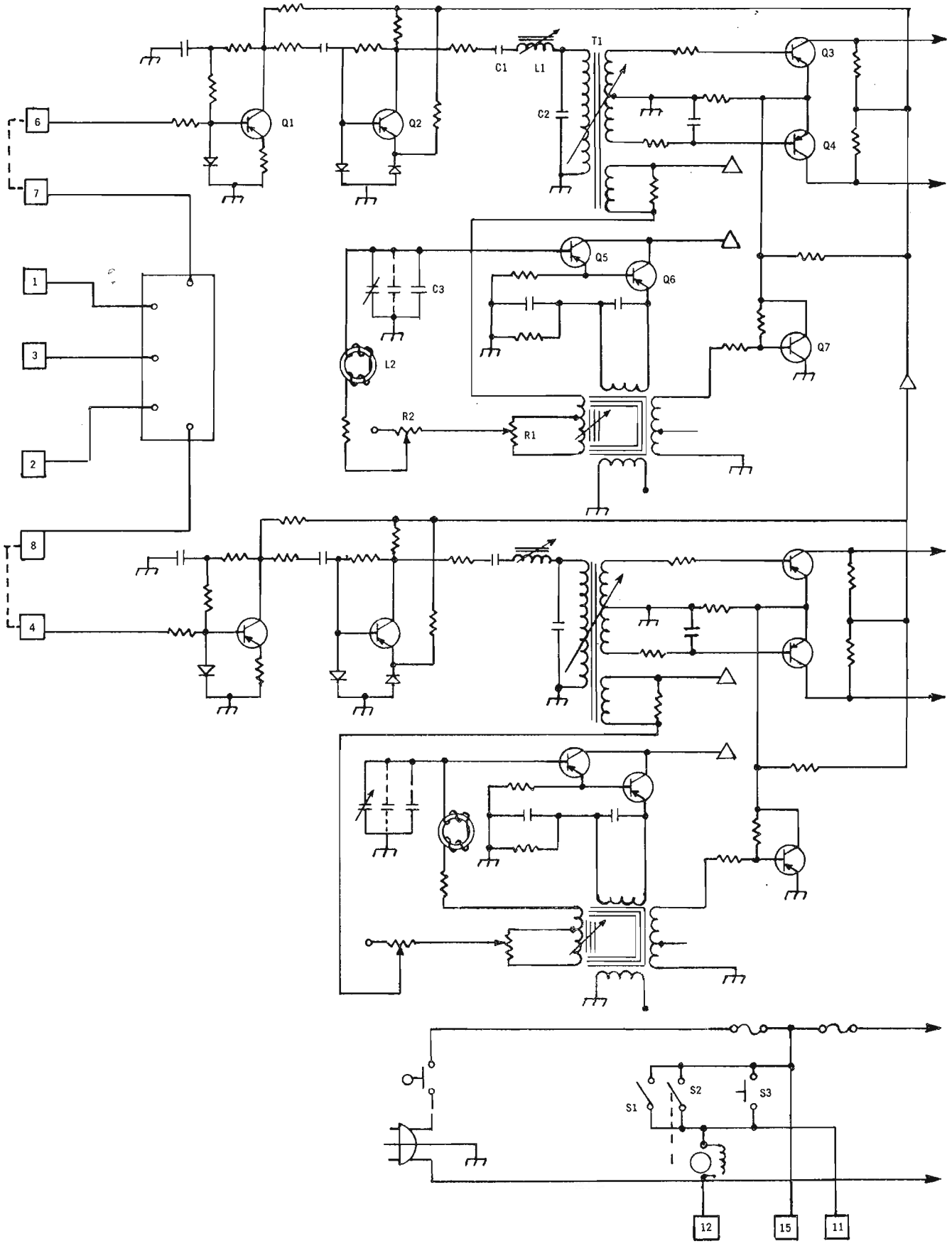

Fig. 3 — Circuit of Typical Receiver

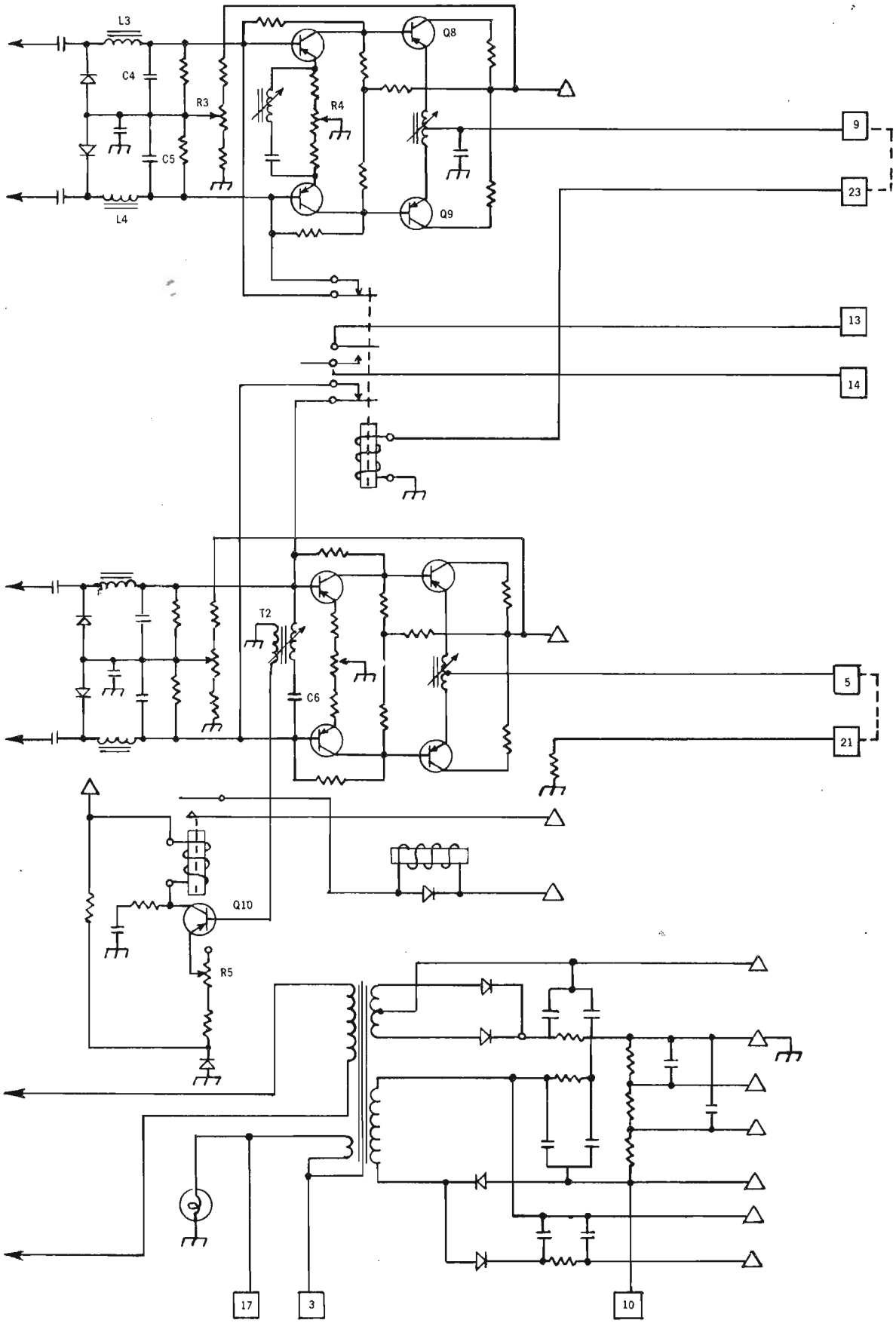

Fig. 3 (Cont'd) — Circuit of Typical Receiver

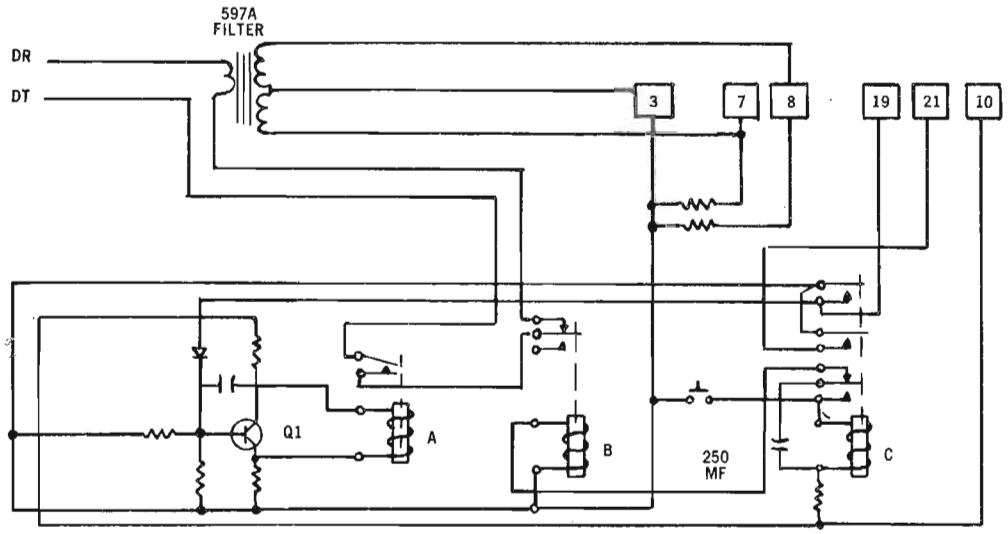

Fig. 4 — Transmitter End of Message Circuit

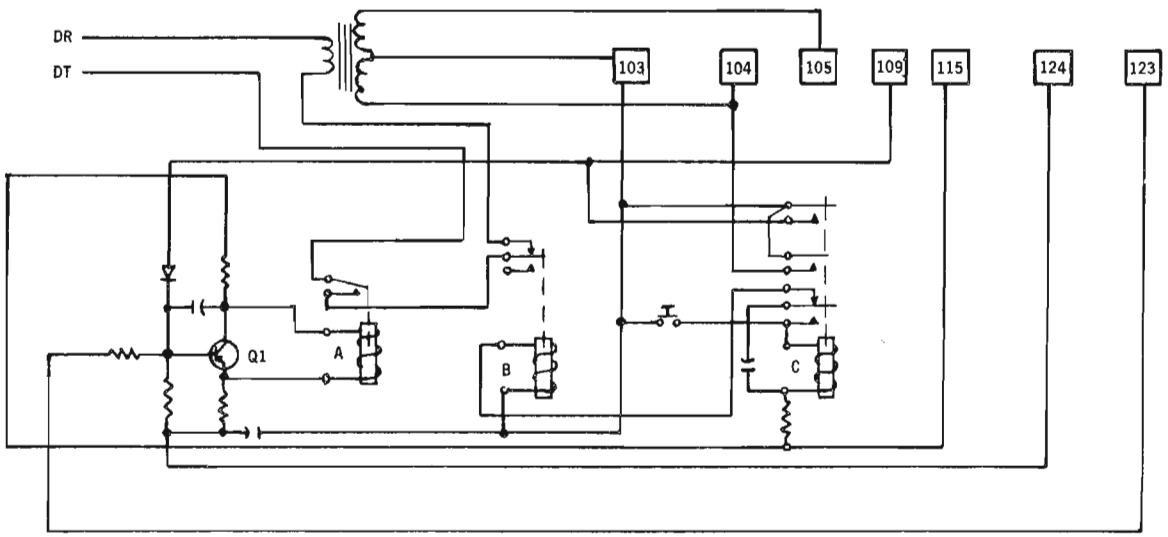

Fig. 5 — Transceiver End of Message Circuit

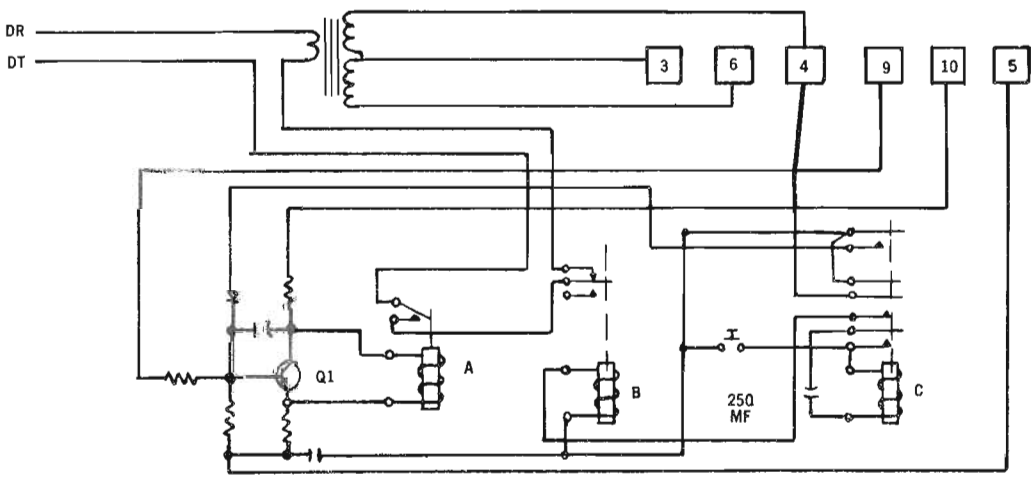

Fig. 6 — Receiver (Previous to Code 011) End of Message Circuit

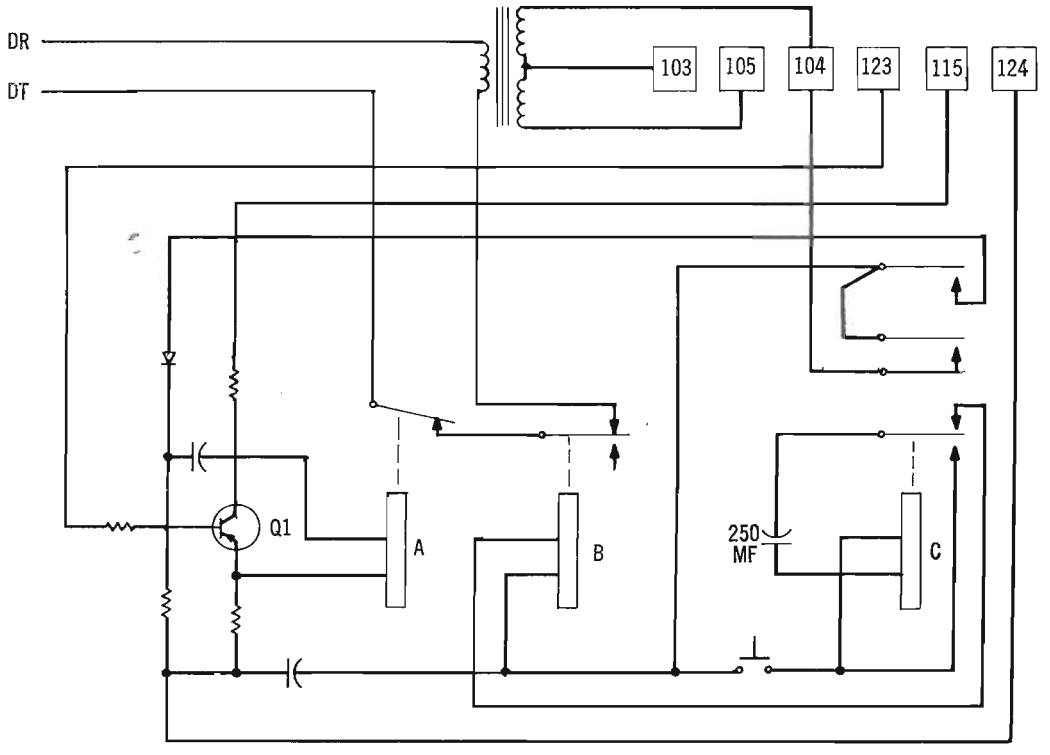

Fig. 7 — Receiver (Code 011 or laber) End of Message Circuit