

THE ADOSO SYSTEM

(Automatic Distribution of Service Orders)

Contents	Page
1. GENERAL	1
2. DESCRIPTION	2
3. OPERATION	5
4. EQUIPMENT	9

Illustrations

Fig 1 Room Circuit	5
Fig 2 Plant Service Center Receiving Machines	7
Fig 3 No. 15 Teletypewriter and Station Set	9
Fig 4 No. 14 Transmitter and Single Line Control	10

1. GENERAL

1.01 This section, P65.924.00, is the first in a series of point sections issued to provide information on the ADOSO System, an automatic method of service order distribution using teletypewriter switching equipment.

1.02 The main section, P65.924.00 describes the ADOSO System in general terms. Following sub-sections will provide testing information and detailed operation of the various switching and control equipment used in the system.

1.03 The purposes of the ADOSO System are: to speed up handling service orders, to make more effective use of manpower, and to make maximum use of equipment; to replace by automation, time-consuming manual methods.

1.04 The system makes use of switching and signalling principles well established in the teletypewriter art.

2. DESCRIPTION

2.01 The system automatically picks up orders from tape transmitters in a Business Office (BO) and Plant Service Center (PSC), and transmits them over a common circuit. The common circuit has receiving teletypewriters in Accounting (RA), Directory (DIR), and Traffic Intercept (TI), as well as the BO and PSC.

2.02 Orders are directed to their destinations by Call Directing Characters (CDCs) in the tape.

2.03 Control equipment is provided at the PSC to alternate transmission between the BO and PSC.

2.04 Continuous tape operation is provided at both points, i.e., several orders can be in one tape.

2.05 Tape is prepared on a local room circuit machine consisting of a 15 keyboard teletypewriter, typing reperforator and a transmitter-distributor.

2.06 A typing reperforator is included in the connection at the PSC on some code combinations.

2.07 A monitor typing reperforator is provided on each circuit. This is for service purposes only and is not used in normal handling of traffic.

2.08 Four order registers are provided at the PSC transmitter, one each for orders sent to RA, DIR, TI, and BO. These count the orders sent from either transmitter to all stations except the PSC.

2.09 A register is provided on each receiving machine, except the PSC. These record each order received at the associated stations.

2.10 The PSC periodically transmits a broadcast message giving register readings for messages sent to each station. Each receiving point compares this reading with that on their register as a check against lost messages.

2.11 A circuit assurance feature is provided which causes an alarm to sound at a receiving station if it should become disconnected from the circuit.

2.12 The "Broadcasting" of the message count combined with the circuit assurance features require less circuit and attendant time to protect against lost messages than the "top line" broadcast method formerly used.

2.13 A "code converter" feature is provided at the PSC which reroutes orders by automatically changing their codes. This is helpful with orders sent by the BO to the PSC (Page and tape copy made) for retransmission when completed. The PSC reuses the tape in a room circuit to make up a new "completion order" tape. When sent by the PSC, the code converter changes the code automatically to route the message to the stations that should receive the completion order.

2.14 Carriage return (CR) is used as an end-of-codes signal and FIGS H LTRS as an end-of-message signal.

2.15 Provision is made for clearing the circuit by the PSC if the FIGS H LTRS is not sent.

- 2.16 Form feed-out is provided for the page machines and tape feed-out for the typing-reperforators.
- 2.17 A Plant Circuit is provided between the BO and PSC for orders directed only to the PSC on initial transmission. The equipment provided at the PSC on this circuit also serves as spare for the main circuit.
- 2.18 Each receiving station responds to an individual station code and to one or more group codes.
- 2.19 No. 15 teletypewriter equipment is used for receiving machines at RA, DIR, TI and most BO stations for economic reasons.
- 2.20 Speed of operation is limited to 75 words-per-minute due to 15 type equipment. 28 type equipment can be substituted and speed increased to 100 words-per-minute where necessary.

Additional Equipment Being Designed

- 2.21 Additional circuitry is being designed to permit up to four PSCs and their associated BO to share a common long haul circuit to DIR, TI and RA. Traffic volume and economic factors dictate when this arrangement shall be used.

3. OPERATION

3.01 The Service Order is prepared in punched tape on the room circuit (Fig. 1) at the BO.

Room Circuit

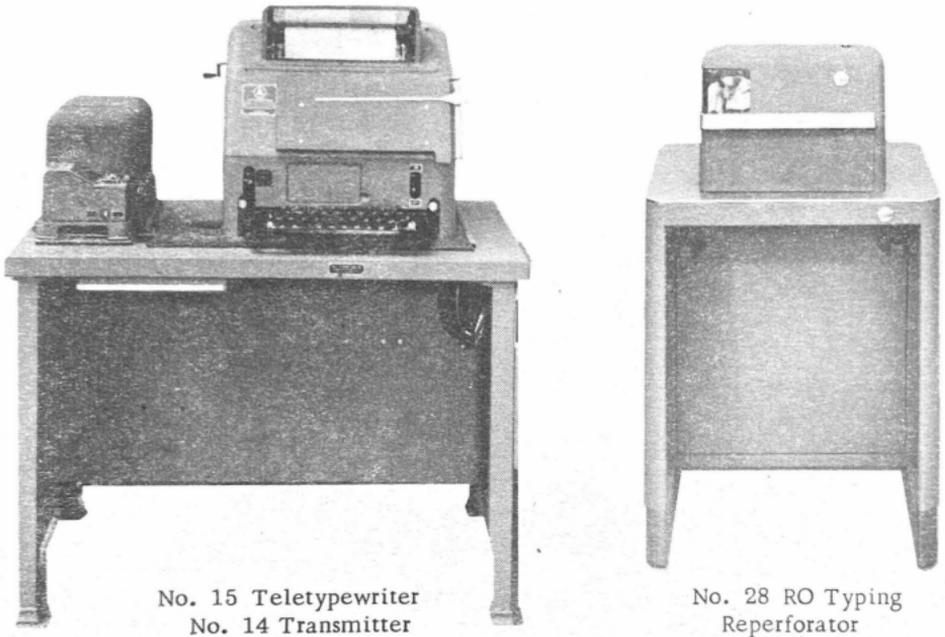


FIG. 1

ROOM CIRCUITS ARE USED FOR TAPE PREPARATION AT BOTH THE BUSINESS OFFICE ORDER WRITING SECTION AND THE PLANT SERVICE CENTER AFTER COMPLETION SECTION.

It is preceded by ten or more LTRS characters for tape insertion and handling, the proper CDCs, LTRS, CR LF LTRS, and is followed by end-of-message signal FIGS H LTRS 10 LTRS.

Example

10 LTRS AE LTRS CR LF LTRS TEXT FIGS H LTRS 10 LTRS

3.02 This tape is inserted in the transmitter. Several orders may be in one tape if they are separated by 10 or more LTRS characters.

3.03 Operation of the START button makes tape available and the transmitter starts automatically when the circuit is idle, and all machines properly aligned.

3.04 A copy may be made on the BO page machine if it is called in by its CDCs (codes JJ, B and JX).

3.05 The desired stations are selected by the CDCs in the tape. All page machines have printing suppression. CDCs do not print.

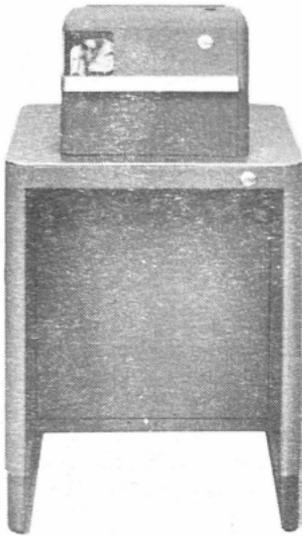
3.06 The selected stations are converted to a printing condition on receipt of CR LF LTRS. All other stations are disconnected.

3.07 The FIGS H LTRS causes forms to be fed out at all selected stations; new forms positioned for next order - and then the circuit goes idle for this period. The PSC typing reperforator feeds out tape on FIGS H LTRS when selected.

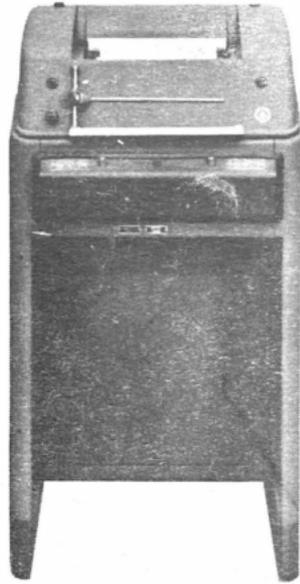
3.08 At end of the feed-out timing interval, the control equipment looks for tape at the PSC and starts that transmitter if tape is available. If none is available, it again looks for tape at the BO. If there is no tape in either transmitter it sends a circuit assurance pulse about every ten seconds until tape is placed in one of the transmitters. This pulse is a momentary open.

3.09 Both tape and page copy are made of orders received at the PSC "Before Completion" section (Fig. 2) which are to be retransmitted after being worked by the PSC.

Plant Service Center Receiving Machines



No. 28 RO Typing
Reperforator



No. 28 RO
Teletypewriter

FIG. 2

ABOVE MACHINES PRODUCE BOTH PAGE AND TAPE COPIES OF ORDERS AS REQUIRED FOR USE IN THE PLANT SERVICE CENTER BEFORE COMPLETION SECTION.

The tape is filed with one copy of the order for use when the order is completed.

3.10 When an order is completed, changes are posted on a copy sent to the "After Completion" section. The operator here, takes the original tape and reruns it on the room circuit making a new tape on

the typing reperforator. The tape is stopped at certain places by FIG. C LTRS perforated in the tape to permit the insertion of required information. This is done by keyboard.

3.11 The new tape is inserted in the PSC line transmitter, a START key pressed, and it is automatically sent to the line when the circuit becomes available.

3.12 Should the order require rerouting to a different group of stations from those selected on the original transmission, the code converter does this automatically by adding a 4th pulse to the original character.

3.13 The PSC has a counter for each outlying receiving station on the line and maintains a count of messages sent to each station. Each station has a register showing the number of messages received by that station.

3.14 Periodically the PSC attendant:

- (a) Operates a key which stops the control equipment at the end of the message being sent.
- (b) Reads the registers.
- (c) Prepares a broadcast tape giving the readings.
- (d) Inserts this tape in the transmitter.
- (e) Starts the control equipment (key operation) to send this message next.

4. EQUIPMENT

4.01 PSD-70005-01 - STATION SET FOR NO. 15 TTY



No. 15 TELETYPEWRITER AND STATION SET PSD-70005-01 USED AT REVENUE ACCOUNTING, DIRECTORY AND TRAFFIC INTERCEPT LOCATIONS FOR RECEIVING ORDERS. THE SAME MACHINE AND EQUIPMENT IS USED AT THE BUSINESS OFFICE WITH EXCEPTION THAT A WIDER FORM IS USED.

FIG. 3

This circuit is for use on receiving machines at RA, DIR, TI and the BO. The circuit is associated with a No. 15 teletypewriter and provides the following features:

- (a) Station selection.
- (b) Printing suppression of codes.
- (c) Form feed-out and alignment.
- (d) Disconnect on CR if not selected.
- (e) Reconnect on idle line at end of transmission if not selected.

- (f) Deactivate on CR if selected.
- (g) Activate on FIGS H LTRS if selected.
- (h) Counts all orders received.
- (i) Alarms if circuit fails or paper runs out.
- (j) Provides for retiring audible alarm and leaving visual alarm until circuit is restored or paper inserted.
- (k) Automatically restores alarm circuit when circuit normal.

4.02 PSD-70006-01 - SINGLE LINE CONTROL - PSC

Plant Service Center Sending -
After Completion Section



No. 14 TRANSMITTER AND SINGLE LINE CONTROL PSD-70006-01. USED FOR TRANSMITTING ORDERS AFTER COMPLETION. NOTE MESSAGE REGISTERS ON TABLE.

FIG. 4

This circuit is mounted on the transmitter table at the PSC. It is associated with the receiving 28 machine, a typing reperforator, a transmitter and provides the

following features:

- (a) Starts the BO and PSC transmitters alternately.
- (b) Withholds transmission while the forms and tape are being fed out following each transmission.
- (c) Sends circuit assurance pulses at ten second intervals if no traffic is available.
- (d) Stops transmission and alarms if a message is not preceded by a valid code or if FIGS H LTRS is omitted at end of transmission.
- (e) Counts the messages for each station.
- (f) Provides for form feed-out if the associated 28 type machine is selected.
- (g) Connects the associated typing reperforator in response to certain codes.
- (h) Provides for sending service messages with priority over the BO.
- (i) Automatically reroutes some completed orders by adding a 4th pulse to any CDC not having a 4th pulse. This is referred to as code conversion.

4.03 PSD-70007-01 - TRANSMITTER START - BO

This is a minor circuit associated with the transmitter at the BO. It provides the following:

- (a) Connections for either the 14 type transmitter or the multiple transmitter.
- (b) In the case of the 14 type it provides a key and relay which enables the operator to load the transmitter and then makes tape available by pressing a key. This feature, which prevents transmitter start while loading, is incorporated in the multiple transmitter.

4.04 PSD-70008-01 - PLANT CIRCUIT TRANSMITTER START - BO. This equipment is the transmitter control portion of the "overflow" or Plant Circuit for handling orders sent from the Business Office to the Before Completion Section of the Plant Service Center. This equipment is located at the Business Office and has the following features:

- (a) Starts multiple transmitter when loaded.
- (b) Starts 14 transmitter when loaded, and key is operated.
- (c) Stops transmitter if it receives a reversed loop from receiving control circuit, PSD-70009-01 at the Plant Service Center.
- (d) Stops transmitter if the loop goes open.

4.05 PSD-70009-01 - STATION CONTROL - PSC

This is the receiving control equipment associated with the "overflow" or Plant Circuit for handling orders sent from the Business Office to the Plant Service Center. It is located in the Plant Service Center, works with the PLANT CIRCUIT TRANSMITTER START PSD-70008-01, and has the following features:

- (a) Causes form feed-out and tape feed-out at end of each order.
- (b) Withholds transmission during feed-out.
- (c) Provides for the use of the 28 RO teletypewriter and 28 RO typing reperforator in place of those normally associated with the main circuit control equipment PSD-70006-01.

4.06 PSD-70010-01 - BRANCH STATION CONTROL -

BO. This circuit, located at the Business Office, controls a No. 14 or multiple transmitter and is as-

sociated with a 28 RO teletypewriter. It can be operated over a single loop or toll facility and provides the following features:

- (a) Station selection on codes J, D & B.
- (b) Printing suppression of all codes.
- (c) Form feed-out and alignment on receiving FIGS H LTRS.
- (d) Deactivate, non-print on CR when not selected.
- (e) Deactivate, print on CR when selected.
- (f) Activate, non-print on FIGS H LTRS.
- (g) Counts all orders received.
- (h) If paper runs out, will alarm and hold circuit busy.
- (i) Hold key to busy the circuit and allow operator to change paper or ribbon.
- (j) Alarm on a open circuit.
- (k) Flashing busy lamp when circuit busy at transmitting and receiving position.
- (l) Power-on lamp at receiving position.
- (m) Circuit assurance when no tape available and transmitter start code Y received.
- (n) Start transmitter when tape available and transmitter start code Y received.
- (o) Stop transmitter and alarm if CR before call directing codes.

- (p) Stop transmitter and alarm if open or blank received while transmitting.
- (q) Alarm cleared by operator removing tape from transmitter.
- (r) START key and lamp to show tape available.
- (s) Wiring information for either No. 1 or No. 14 type transmitter.
- (t) Break key at receiving machine so operator can send break, and stop incoming transmission if receiving garbled copy.

4.07 PSD-70011-01 - BRANCH STATION CONTROL - PSC. This circuit at the PSC starts the PSC transmitter or selects the typing reperforator at the PSC, and operates over a single local loop or a toll facility. The unit will mount on the transmitter table for connection to the 28 RO teletypewriter by local cabling. It provides the following features:

- (a) Starts transmitter on TSC "Z".
- (b) Selects typing reperforator on CDC "Y" and locks it selected on CDCs AU, AA, EE, EU, KE, or KA.
- (c) The 28 RO teletypewriter will be selected mechanically on CDCs AU, AA, EE, EU, KE, KA or JX and go into a print condition on carriage return.
- (d) Single CDCs J, N, R, D, B, or X received after the CDC "Y" will blind the typing reperforator and cause a short tape feed-out.
- (e) Adds the fourth pulse to any character sent before carriage return.
- (f) Stops transmitter and operates alarm if a carriage return or blank is sent before a valid

CDC. The tape must be removed from transmitter to clear the alarm.

(g) Stops transmitter and operates alarm any time a break is received. The tape must be removed from transmitter to clear the alarm.

(h) Transmits a circuit assurance signal to the line if TSC "Z" is received and tape is not available.

(i) The 28 RO is equipped with mechanical form feed-out activated by FIGS H if in a selected condition.

(j) Counts messages received.

(k) A key is provided to hold the line busy while the paper or ribbon is being replaced. This hold-busy is automatic after FIGS H if the paper runs out.

(l) An external break key is provided to stop the BO transmitter if needed.

4.08 PSD-70012-01 - MULTI-LINE CONTROL - CONTROL PSC. This circuit will switch four independent BO and PSC line circuits to one line having TI, DIR, and RA teletypewriters on it.

4.09 Associated with this circuit will be a 28 RO typing reperforator (line monitor), 28 sequential selector and a 28A transmitter distributor.

4.10 It will be installed at one of the four PSCs, in addition to the normal PSD-70011-01 equipment and provide the following features:

(a) Timer on each of the four BO, PSC line circuits, which after a FIGS H is received, shows that line busy until form feed-out is completed.

- (b) Will connect to each of the four branch circuits in sequence and send transmitter start codes Z and Y.
- (c) Upon receiving a no-tape-available signal from a branch circuit, will step to next branch and send transmitter start code Z and Y.
- (d) If no circuit assurance is received, will alarm.
- (e) Key to send FIGS H LTRS on line and clear alarm.
- (f) When picking up tape if message is between PSC and BO will step to next branch when CR is read on line.
- (g) Will step past all busy branch circuits.
- (h) Skip keys to busy out each individual branch circuit.
- (i) Busy lamp for each branch circuit.
- (j) Key to stop controller from searching for manual operation.
- (k) Lamp to indicate to which branch circuit controller is connected.
- (l) Lamp to indicate branch circuit on skip.
- (m) Individual message count for each machine on branch and trunk circuit.
- (n) Send LTRS signal for circuit assurance at slow intervals on trunk when all branch circuits busy or controller stopped for manual operation.

4.11 PSD-70013-01 - STATION SET FOR NO. 28 TTY

This circuit to be used on outlying station's receiving machines at RA, DIR, TI and the BO where the 28 TTY is used in place of the No. 15. It provides similar features to that of circuit PSD-70005-01 STATION SET FOR NO. 15 TTY.