

FEATURE DOCUMENT
DIAL TONE FIRST AND COIN SERVICE IMPROVEMENT
NO. 2 ELECTRONIC SWITCHING SYSTEM

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NOTICE

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FEATURE DEFINITION AND DESCRIPTION**1. DEFINITION**

1.01 Dial Tone First (DTF) is a feature that is part of the Coin Service Improvement package. It enables a coin customer to dial certain calls without requiring an initial coin deposit. These include assistance calls to an operator, station-to-station toll calls, person-to-person calls, collect calls, credit card calls, toll directory assistance calls, and 3-digit service codes.

1.02 The coin service improvement package includes DTF and the additional feature of fraud protection. This is accomplished by disabling the TOUCH-TONE® dial during times when the call is connected to the operator. This eliminates the simulation of a coin deposit by manipulation of the dial keys.

1.03 Dial Tone First is provided in a No. 2 Electronic Switching System (ESS) office by changing the basic coin service from ground start to loop start operation and implementing hardware and software changes described in Parts 10 and 11 of this section.

2. DESCRIPTION**A. Customer (User) Perspective**

2.01 The coin station user may initiate a call to a free number (i.e., a call to the assistance operator, XII service code, or an intraoffice call to a directory number marked free) by removing the receiver and upon receipt of dial tone, dialing the number without the deposit of a coin(s). If a number dialed is to a nonfree number and no coin has been deposited, the call is routed to a recorded announcement or reorder tone. If a coin is deposited and a free number is dialed as described in the following paragraph, the coin is returned on completion of the call.

2.02 Typical dialing codes used and treated as free numbers are "0" (zero) for the assistance operator and all 3-digit service codes such as 911.

2.03 On calls to an operator that has the ability to collect or return coins, the TOUCH-TONE dial on coin stations so equipped is automatically disabled to prevent fraudulent simulation of coin deposits. This also prevents end-to-end signaling

with the TOUCH-TONE dial on calls placed through an operator.

B. System Implementation

2.04 When the coin station goes off-hook, a loop closure is placed on the tip and ring conductors to the central office. Since the line equipment (terminal equipment number) is arranged for loop start, the line scanner detects the loop closure and informs the processing programs of an origination. Dial tone is then returned to the coin station.

2.05 When the coin station dials the called number, system translations determine the charge treatment of the call. If the call is free (e.g., 911) the call is routed as normal. If the call is a charge call, a coin test is made by the customer dial pulse receiver (CDPR). If the initial deposit is present, the call is routed in the normal manner. If the initial deposit is not present, the call is routed to a recorded announcement which requests that the customer hang up, reoriginate, insert the initial deposit, and redial the call. If the coin test is satisfied, the call is routed in the normal manner.

2.06 If the call is an untimed charged call, the system awaits answer detection. At answer recognition, a 700-ms charge delay interval is timed before the call is considered chargeable. If either subscriber disconnects before the end of the charge delay period, the coin is returned and the call disconnected. When the charge delay period elapses and the calling and called subscribers are in the talking state the system awaits recognition of disconnect. At disconnect the coin deposit is collected.

2.07 Coin control functions such as collect, return, and coin test (except initial coin test at end of dialing) are made by the Coin Control Circuit (SD-2H125). This circuit tests for presence of coins by application of positive or negative 48-volt dc potential through a sensitive relay to the tip conductor of the coin line. Collection or return of coins is accomplished by application of ± 130 volt dc potential through a ferrod sensor to the tip conductor. The flow of current detected by the ferrod informs the processor of the presence of a coin. When current stops flowing the collect or return operation is considered successful. Positive potential is normally used for collect and negative potential for return. However, opposite polarities may be provided as a local office program option

when all coin stations were nondial tone first. Table A summarizes the various voltages used to control coin functions.

TABLE A

COIN CONTROL VOLTAGES

VOLTAGE	PURPOSE
+48 VDC	Coin presence, supervision fraud prevention 5-cent overtime deposit
-48 VDC	Coin presence supervision
+130 VDC	Coin Collect (TYPICAL)*
-130 VDC	Coin Return (TYPICAL)*

* Selected by option

3. FEATURE FLOW DIAGRAM

3.01 A feature flow diagram giving the functional operation of an originating coin call in No. 2 ESS is shown in Figure 1.

4. INTERACTIONS

4.01 Prepay coin lines may be intermixed with dial tone first lines in an office by providing loop start or ground start line equipments and assigning the appropriate major class code.

4.02 Local overtime and coin zone call options may be used with dial tone first operation. See Section 232-190-112 Basic Coin Service for implementation of these features.

4.03 The fraud elimination portion of the coin service improvement package provides +48 volt office battery on operator trunks to disable the TOUCH-TONE dial of a coin station when connected to an operator. Also, the positive potential is required in order for the coin station to signal deposits of less than the initial rate. These deposits may be requested by the operator on overtime or toll calls. This feature must be implemented at the same time as dial tone first.

ATTRIBUTES

5. STATION/SYSTEM

5.01 Dial tone first is provided on a per-coin line basis.

5.02 Dial Tone First provides the ability to place calls to free numbers without depositing a coin.

5.03 The Dial Tone First feature also provides the advantage of avoiding customer dissatisfaction. When dial tone is heard, the customer can be reasonably certain that the coin station is in working order before depositing money.

6. LIMITATIONS

6.01 Disabling the TOUCH-TONE dial while the coin station is connected to a toll switchboard or TSPS operator also prevents TOUCH-TONE end-to-end signaling.

7. RESTRICTION CAPABILITY

7.01 Dial tone first coin lines may be restricted in the same manner as any other discrete class of service. Since these lines have different line screening classes, they may have charging and routing treatment different from other types of lines.

8. COST DATA

8.01 Software requirements in addition to that which is required for prepay coin service include the following:

- One or two new line class codes must be provided to define single or multislot coin classes of service
- Program store translation area required to provide one recorded announcement trunk group ("No initial coin deposit" recording)

8.02 Hardware requirements include the following items. The exact number of each item is determined by traffic conditions and can be found by consulting Traffic Facilities Practices, Division D, Section 12.

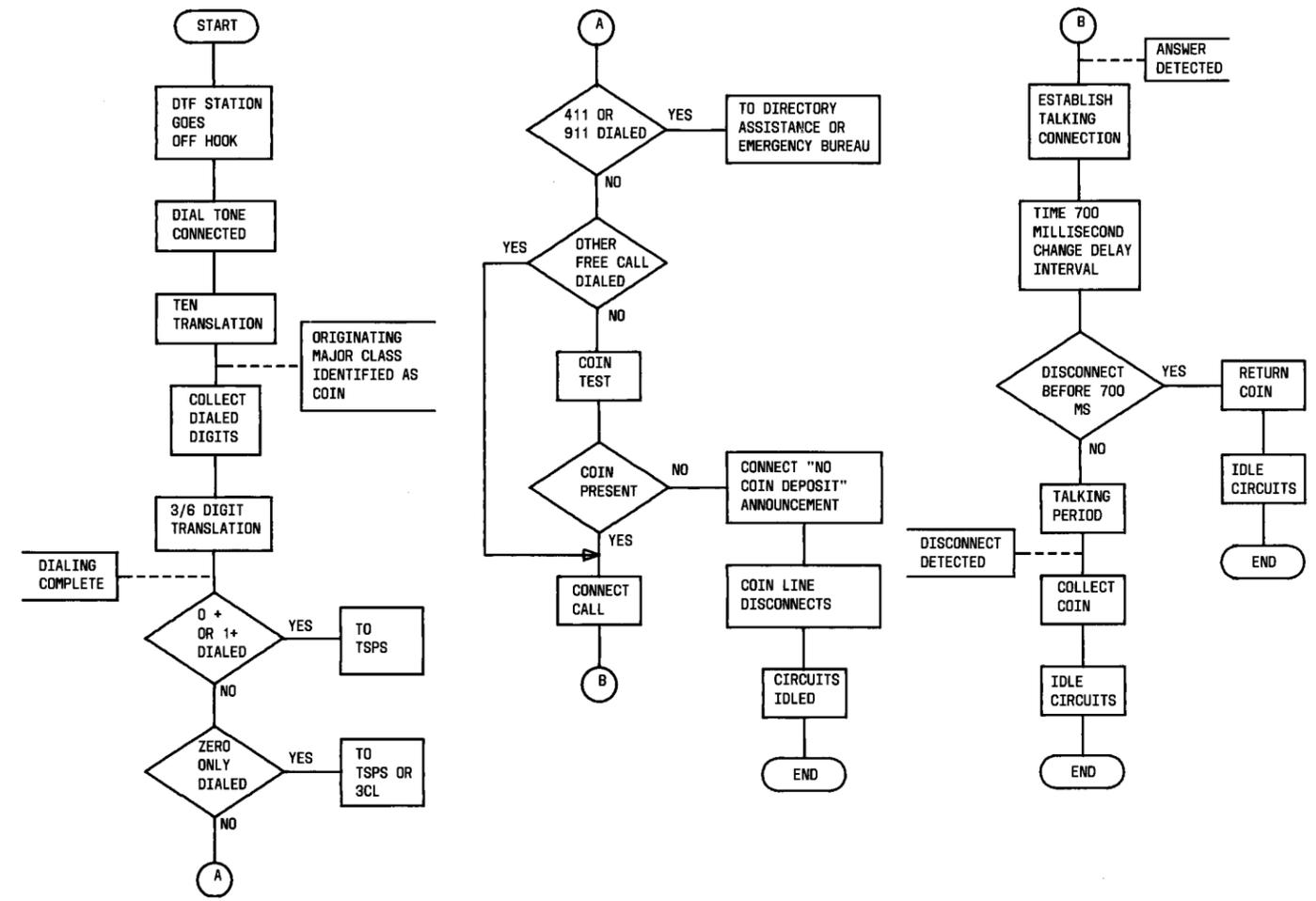


Fig. 1—Dial Tone First Feature Flow Diagram

- SD-2H125 Coin Control Circuits if not previously installed for prepay coin service
- SD-2H119 Audible Ring and recorded announcement circuits (for "No Coin Deposited" announcement).
- One Announcement Channel on the SD-1A139 recorded announcement machine. If the six channels on an existing machine are already in use, an additional recorded announcement machine must be provided.
- Additional customer dial pulse receivers may be required due to increased holding time with DTF. (Holding time is increased due to extra time required for coin presence test. Also with DTF, the receiver is connected sooner than with prepay.)
- Provision of operator trunk circuits with the option to provide +48 volt supervisory battery.
- Provision of one SD-2H091 +48 volt supply and distribution circuit for each 16 operator trunk circuits accessible from DTF coin lines.
- Provision of new or modified coin telephones.

8.03 In addition, line ferroids for prepay coin lines must be modified to loop start. This must be coordinated with coin station prepay to DTF modifications.

INCORPORATION INTO SYSTEM

9. PLANNING

9.01 The sequences of hardware, software, and/or station modifications will be covered in Part 14, GROWTH/RETROFIT PROCEDURES.

10. HARDWARE ENGINEERING

10.01 To equip a No. 2 ESS office for DTF, the following hardware items are required:

- If no coin lines were previously installed, a number of Coin Control Circuits with dial tone first features (SD-2H125) must be installed. See Traffic Facilities Practices, Division D, Section 12d for determination of quantities.
- Provide a number of trunk circuits required for operator services. This includes trunks that provide assistance, toll switching, coin zone, stuck coin, and TSPS operator services when required. Order these circuits with the +48 volt option. Tables B and C summarize the circuits available, their use, options, and trunk order codes. These trunks may be in common trunk groups that serve both DTF and prepay coin service.
- Provide one + 48 Volt Supply and Distribution Circuit (SD-2H091) for every 16 operator trunk circuits dedicated to DTF.
- Provide a number of audible ring and recorded announcement circuits (SD-2H119) for the "No Coin Deposited" trunk group
- Provide one channel on a SD-1A139 recorded announcement circuit. A channel can supply a maximum of 116 recorded announcement trunks.
- Provide any additional CDPRs required due to increased holding time anticipated because of the DTF feature.

TABLE B

OUTGOING OPERATOR TRUNK CIRCUITS FOR DTF OPERATION

SD NUMBER	USE	OPTION	TRUNK ORDER CODE	FRAME TYPE
2H105	Outgoing to 3CL Switchboard - Loop Supervision - DC control	X, Z	20321	M
2H110	Outgoing to 3CL Switchboard - Inband Signaling	W, T	40721 or 48121	U
2H112	Outgoing to 3CL Switchboard or TSP/TSPS - E&M Signaling	R, V or R, W	50921 or 50922	M
2H113	Outgoing to Coin Overtime or Stuck Coin Operator	Y	21021	M
2H144	Outgoing to TSP/TSPS Operator	S, X	23822	M
2H151	Outgoing to Coin Zone Operator	Y	23921	M

TABLE C

INCOMING OPERATOR TRUNK CIRCUITS FOR DTF OPERATION

SD NUMBER	USE	OPTION	TRUNK ORDER CODE	FRAME TYPE
2H108	Incoming from 3CL Switchboard - DC Control	X	30500	M
2H110	Incoming from 3CL Switchboard - Inband Signaling	W, T	40721 or 48121	U
2H112	Incoming from 3CL Switchboard - E&M Signaling	R, V	50921	M

10.02 In addition, any prepay coin lines that are being converted to DTF must have their line ferros changed from ground to loop start. This must be done simultaneously with the totalizer conversion at the coin station and line translation changes described in the software portion of this section.

11. SOFTWARE ENGINEERING

11.01 Software requirements for the individual DTF coin lines involve changing the Terminal Equipment Number Translator. This can be accomplished by submitting a Recent Change Service order for each coin line to be added or

changed to DTF. The line class code used in the service order must be one in which the major class is 26 or 27. If no line class code exists for DTF, one must be provided by submitting ESS Form 2306 to office data administration (ODA). See A RC:L/ message in the input manual or Section 680-536-011 for details.

11.02 If routing and/or charging for DTF is different than prepay or this is the initial installation of coin service, consideration must be given to the Rate and Route Table (ESS Form 2301) and the Charge Index Expansion Table (ESS Form 2302). The rate and route table may be used to specify routing for coin traffic and entries to the charge table. The charge index expansion is used to define all local charging instructions. See the TG-2H for details.

11.03 Other software requirements are dependent on the number of coin lines and the various trunking arrangements required for the particular office involved. Refer to Traffic Facilities Practices Division D, Section 12 for details.

12. COMPATIBILITY

12.01 The DTF feature is compatible with the following coin telephone sets:

200	Multislot	Box Type	Rotary Dial
1C1	Single Slot	Box Type	Rotary Dial
1C2	Single Slot	Box Type	TOUCH-TONE Dial
2C1	Single Slot	Panel Type	Rotary Dial
2C2	Single Slot	Panel Type	TOUCH-TONE Dial

The slide switch of the totalizer in the single slot sets must be set to the DTF position. See Section 506-410-400 for details on coin station sets and for connection information.

13. OFFICE DATA

A. Translations

13.01 The translation flow required for DTF service is shown in Figure 2.

13.02 The following Translation Input Forms are affected by DTF and should be considered when submitting to the WECO Regional Center for the initial ODA run. Refer to TG-2H for details and other information required to complete these forms:

FORM	TITLE
2100	Directory Number Table
2201	Trunk Assignment Table
2202	Trunk Group Table
2301	Rate and Route Table
2302	Charge Index Expansion Table
2303	Route Index Expansion Table
2306	Line Class Code Table
2500	General Information Table
2509	Recorded Announcement Table.

B. Recent Change (RC) Messages

13.03 Information on ESS form 2100 is recent changeable (using the A RC:L/ message) and effective immediately after the RC message is accepted by the system. See Section 680-536-011 for details on line recent change procedures.

13.04 In addition, changes to routing, charging, and trunk group translations may be made using the following RC messages:

MESSAGE	EXPLANATION
A RC:CRI*	Used to change a Route Index on a given code index
A RC:DIG*	Used to make changes in the 3- and 6-Digit Translator
A RC:GRP	Used to change single translation words in trunk or service circuit group tables
A RC:RI*	Used to change a Route Index

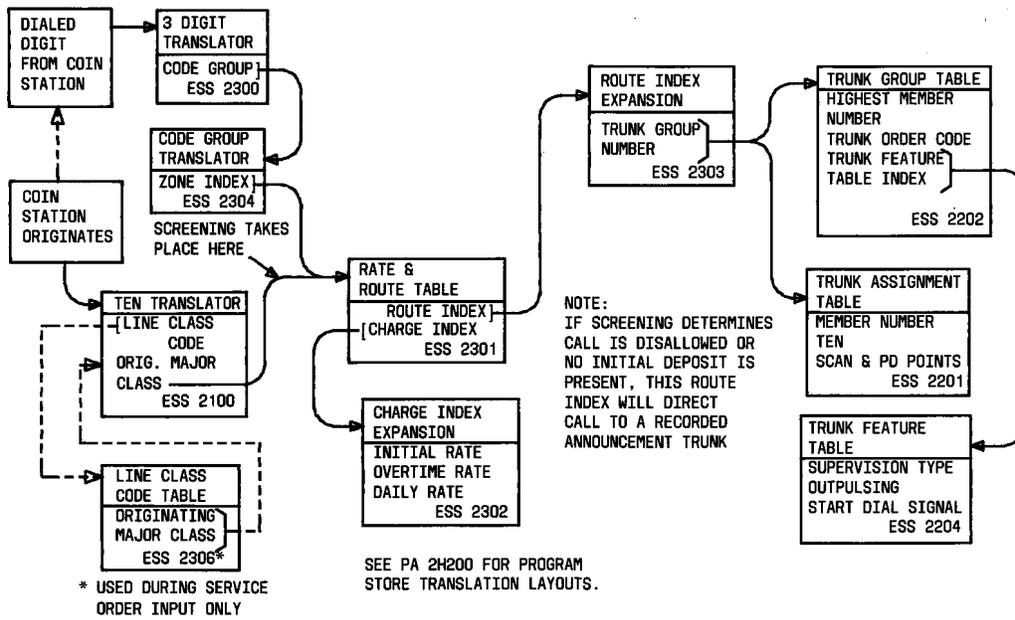


Fig. 2—Translation Flow for Dial Tone First Coin Call

A RC:TRK Used to change data associated with trunk groups.

13.05 The RC messages marked with an asterisk are recent change hunted when the A RC:RCH message is typed after a particular RC is inputted. See IM-2H200 for details.

14. GROWTH/RETROFIT PROCEDURES

14.01 The software part of this feature is available with all current generic programs available for No. 2 ESS. Translation changes required to retrofit DTF may be made via recent change procedures described in Part 13. Hardware changes required for retrofit are the same as those described in Part 10.

14.02 The step-by-step sequence for retrofitting DTF in a No. 2 ESS is as follows:

- (1) Convert all 1A-type coin stations to 1C-type stations.
- (2) Provide the necessary number of new or additional SD-2H125 Coin Control Circuits.

(3) Install +48 Volt Converters (SD-2H091) in all universal and miscellaneous trunk frames operator services trunks for DTF coin lines.

(4) Modify all operator trunks for +48 volt operation.

(5) Provide any additional service circuits required (e.g., customer dial pulse receivers) because of the additional holding times involved with DTF.

(6) Install the required trunk circuits in the miscellaneous and/or universal trunk frames for the various operator and recorded announcement trunk groups.

(7) Provide a channel on the recorded announcement (RA) machine with the "No Coin Deposit" announcement. It may be necessary to install an additional RA machine if there are no channels available on the existing machine.

(8) Input all software data required to activate the hardware installed or changed up to this point. This includes the items covered in Parts 11 and 13 of this section. An ODA run is necessary for updating the General Information Table and defining any new trunk or service

circuit groups. Do not change any line translations until Step 10 of this procedure.

(9) Convert station equipment from prepay to DTF. This must be done concurrently with Step 10.

(10) Convert the coin line ferroids from ground start to loop start. A recent change line service order must be submitted at the same time to delete the ground start feature from the line translations and change the major class code.

15. TESTING

15.01 Testing individual coin lines is accomplished by RC verification of translation changes and by placing test calls from the coin stations.

15.02 Coin control circuits are tested by system diagnostic programs utilizing the SD-2H135 Ringing and Coin Control Test Circuit. This test checks the ability of the coin control circuit to detect the presence of coins in coin stations and output the proper coin collect and return voltages.

ADMINISTRATION

16. MEASUREMENTS

16.01 The usual peg count, usage, overflow, and maintenance busy traffic measurements are available for the trunks and service circuits associated with DTF coin service. In addition, the Customer Line Usage Measurements feature of the traffic and Plant Measurement Program (PD-2H116) can be used to measure usage on individual lines including coin lines. Up to 64 lines of all types can be measured at any one time. See Section 232-120-301 for details.

17. RECORD KEEPING

17.01 The ESS Record forms (2100-R, etc.) correlated to ODA Input Forms referred to in Part 13 should be maintained and updated as required.

18. CHARGING

18.01 Refer to Section 232-190-112 for charging information as applies to DTF coin service.

AVAILABILITY

19. NEW INSTALLATIONS

19.01 This feature is available with any issue of a No. 2 ESS generic program.

20. GROWTH/RETROFIT

20.01 The DTF feature can be retrofitted as an addition to any No. 2 ESS office.

SUPPLEMENTARY INFORMATION

21. GLOSSARY

21.01 The following list defines abbreviations and nonstandard terms used in this document.

CDPR—Customer Dial Pulse Receiver

DTF—Dial Tone First

Ground Start—A line which requires a ground on the ring conductor to saturate the line ferrod as a request for dial tone

Initial Period—The initial unit of time (commonly three minutes) for which a call is charged a predetermined amount

Line Class Code—Three-character alphanumeric code that specifies a customer class of service

Loop Start—A line which requires a short on the tip and ring conductors to saturate the line ferrod as a request for dial tone

Major Class—A term used to describe an originating or terminating class of service exclusive of screening treatment

Overtime Period—The talking period after the initial period requiring an additional deposit

Prepay—Coin service requiring an initial deposit before a call can be initiated

TEN—Terminal Equipment Number

RA—Recorded Announcement.

SECTION 232-190-131

22. REASONS FOR REISSUE

22.01 This is the initial issue of this section.

23. REFERENCES

23.01 The following are major references used as the supporting documentation for this feature:

- No. 2 ESS Translation Guide, TG-2H
- J2H031A Trunk and Service Circuit Engineering Specification
- PA-2H200 Office Data Tables Layout Specification
- PD-2H218 Local Charging Program Description
- PD-2H217 Coin Control Program Description
- CD- & SD-2H125 Coin Control Circuit
- Section 232-120-301 Traffic and Plant Measurements
- Section 232-190-112 Basic Coin Services
- Section 506-410-400 Single Slot Coin Telephone Sets
- Traffic Facilities Practices, Division D, Section 12
- Input Message Manual, IM-2H200