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AUTOMATIC TRANSMISSION MEASURING SYSTEM AND ASSOCIATED TESTING ARRANGEMENTS

CENTRALIZED TAPE AND CARD ADMINISTRATION

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ATMS AND ASSOCIATED TESTING ARRANGEMENTS
CENTRALIZED TAPE AND CARD ADMINISTRATION

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1. GENERAL

1.01 This section outlines standard procedures for centralized tape and card preparation for the existing automatic trunk test frames and remote office test lines (ROTLs) that work with the Automatic Transmission Measuring System (ATMS). These procedures cover tape and card preparation for both operational and transmission testing using these test frames and ROTLs. While not described in detail, provision has also been made for preparation of tapes to control operational tests on earlier automatic trunk test frames which require control tapes but do not work with ATMS.

1.02 The purposes of this tape and card administration plan are to:

(a) Establish centralized procedures that are more effective in updating ATMS control media than local preparation at the test frames.

(b) Provide a standard format for ATMS tapes and card decks that is acceptable for mechanized procedures and is in such a form that people can read and understand the resulting printouts at the test frames.

1.03 Use of common language is specified throughout these procedures to ensure compatibility between companies and with future Business Information Systems (BIS) so that procedures described herein can be integrated with appropriate BIS systems when they become available.

A. Test Frame and ROTL Operation

1.04 Several different automatic trunk test frames and remote office test lines (ROTLs) have been designed to work with the Automatic Transmission Measuring System (ATMS) in the various types of switching offices. These test frames and ROTLs provide the means for seizing the trunks to be tested and for pulsing forward the codes of the desired test lines at the distant ends of the trunks. In addition, the test frames and ROTLs perform various operational trunk tests.

1.05 The test frames and ROTLs which work with ATMS are:

(a) Automatic Progression Trunk Test Frame for No. 5 Crossbar Offices (APTT) with optional ROTL control.

(b) Automatic Outgoing Trunk Test Frame for Step-By-Step Offices (AOTT) with optional ROTL control.

(c) Automatic Outgoing Trunk Test Frame (AOTT) for No. 4A and 4M Toll Switching Systems.

(d) Automatically Directed Outgoing Intertoll Trunk Test Frame (ADOIT) for No. 4A and 4M Toll Switching Systems.

(e) ROTL for small Class 5 No. 5 Crossbar Offices.

(f) ROTL for small Class 5 Step-by-Step Offices.

Other planned ATMS, associated testing arrangements, including Centralized Automatic Reporting on Trunks (CAROT) have been considered and the procedures discussed herein are expected to be compatible.

1.06 The ATMS director is capable of conducting automatic transmission tests to the following types of test lines: the new 100-type combined milliwatt and balance test line for far-to-near loss and near end noise measurements; the 102-type test line for far-to-near loss measurements; the 104-type test line for 2-way loss and near-end noise measurements with an optional far-end noise check; and the 105-type test line for 2-way loss and noise measurements at both ends.

1.07 The operational testing capabilities of the various test frames and ROTLs are unique to the type of switching machine and trunking environment for which they were designed. Details of operational testing capabilities can be found in the appropriate sections for each test frame and ROTL.

1.08 Generally, all outgoing trunks that do not involve an operator can be tested automatically. In some situations arrangements are provided for by-passing a CAMA or TSP operator so that automatic testing can be done.

1.09 Information needed by the test frame to seize a specific trunk and to secure a connection to a test line at the distant end is supplied to the test frame on punched paper tape or cards (control medium). The actual content, format, and type of control medium depends on the type of test frame as discussed in Parts 3 through 6.

1.10 Information necessary for the ATMS director to make appropriate transmission loss and noise measurements and to evaluate the results is supplied to the test frame by means of the control medium.

1.11 Where test frames have been arranged to control ROTLs as shown in Fig. 1, the control medium must also contain the ROTL directory number and ROTL control information.

1.12 Information that can be readily understood by the Plant forces and that aids in identifying the trunk being tested can be entered on the control medium. This information, referred to as identifying information, is not used by the test equipment but is simply passed from the control medium to the output tapes, cards, or printouts.

1.13 Results of all measurements made with the test frame or ROTL are available in printed form (full printout) through an associated teletypewriter for tape controlled frames or an electric typewriter for card controlled frames. In addition, a punched tape or card deck containing all results of tests (output tapes or cards) may be produced. Abbreviated printout modes are also available and a busy retest tape can be produced.

1.14 Statistical data on the results of ATMS tests can be obtained by scoring 34 mechanical deviation registers. Two registers, one for loss and one for noise, total all measurements. Twenty-nine registers count measurements of loss or noise deviations from the expected measured loss or noise maintenance limit in 29 different intervals. One register counts all loss deviations that exceed 3.7 dB. One register counts all noise measurements that exceed the noise maintenance limit. Another counts those that exceed the noise immediate action limit. The control medium contains an entry which is used to control the scoring of these registers.

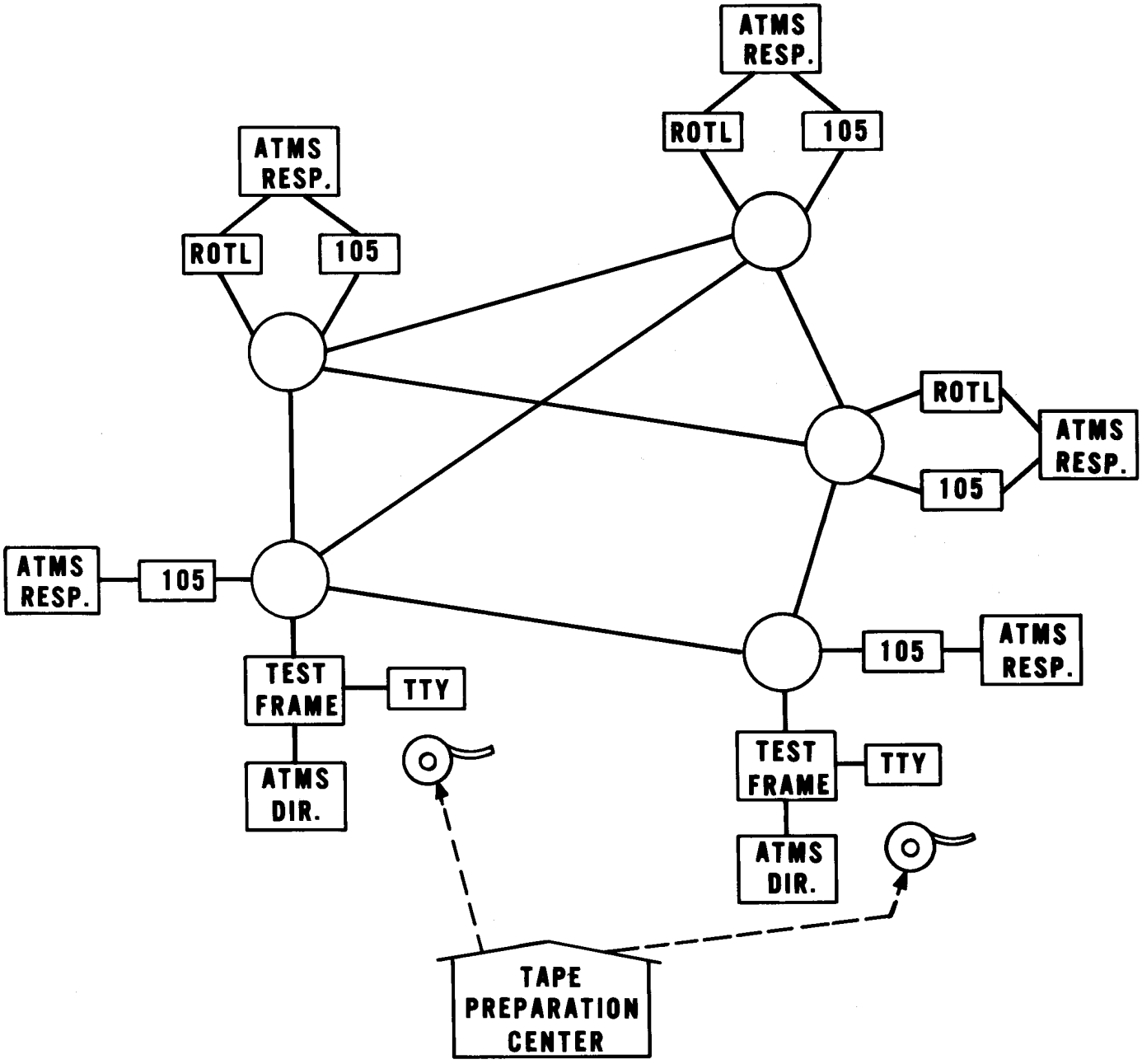


Fig. 1—Trunk Testing Arrangements Using Test Frames and Remote Office Test Lines

B. Input Information Required

1.15 Four types of information are required to do automatic trunk testing.

(a) Identifying information

(b) Test procedure instructions for the test frame or ROTL

(c) Trunk access instructions for the test frame or ROTL

(d) Transmission testing parameters for the ATMS director

Except as noted in Part 6, all of the above input information is reproduced on the printout and on the data tapes or output cards when these are used.

1.16 Test procedure instructions must be given to the individual test frames and ROTLs in various ways. For example, test procedure instructions must be completely specified on the control tape for the step-by-step AOTT frame. For the No. 4 crossbar AOTT frame, some test procedure instructions are provided by key settings on the AOTT frame.

1.17 Trunk access instructions, transmission testing parameters, and identifying information are handled in essentially the same way for all test frames.

1.18 Parts 3 through 8 describe the input information requirements of four automatic trunk test frames and two ROTLs. Table 1 lists the control media used by each of the six test devices. Part 9 summarizes the similarities and differences among the test devices.

TABLE 1

CONTROL MEDIA

APTT-5XB	5-Level Paper Tape (28-Type TTY)
AOTT-SXS	5-Level Paper Tape (28-Type TTY)
AOTT-4XB	8-Level Paper Tape (35-Type TTY)
ADOIT-4XB	80-Column Data Card
ROTL-5XB	Signals from APTT-5XB or AOTT-SXS
ROTL-SXS	Signals from APTT-5XB or AOTT-SXS

C. Standard Control Tapes and Card Decks

1.19 Since standardizing the control media is a prerequisite to development of standard computer programs for tape and card preparation, Part 2 of this section specifies a set of standard tapes or card decks from which each office should select those it needs to meet local conditions.

1.20 Each standard control tape or card deck will be identified by a unique preamble which identifies (a) the office from which the trunks to be tested originate, (b) the tape or deck type, and (c) the date of preparation.

1.21 Each grouping of trunks on a control tape or card deck is identified by a standard caption. This caption contains the Bell System common language circuit identification. For transmission tests, the common language identification is also included for the first major facility nearest the office from which the tests originate.

1.22 Trunks are arranged on the standard control tapes or card decks in such a way as to facilitate maintenance by:

(a) Identifying troubles common to a facility or trunk group.

(b) Ensuring that each trunk is tested in all modes of operation except switchboard access.

(c) Permitting use of the deviation registers for computing the Trunk Transmission Maintenance Index (Section 301-121-100).

(d) Taking into account the various testing intervals required for trunks on various kinds of facilities per Section 660-402-300.

D. Centralized Preparation

1.23 It is essential that effective procedures be established for periodically updating the tapes or card decks. New circuit orders, facility rearrangements, traffic load balancing of switching machines, and changes in plant testing arrangements each contribute to the need for periodic updating. Experience has shown that the updating process can be administered more effectively on a centralized basis rather than on a local basis at the test frames. Therefore, it is recommended that each company establish one or more Tape and Card Administration Centers to monitor plant rearrangement and change activities and to furnish updated control media for each office in a timely manner.

1.24 The various Engineering, Traffic and Plant groups that generate plant changes affecting ATMS testing should be requested to send copies of change orders generated by their activities as they occur to the Tape and Card Administration Center. Personnel at the center should select the information needed to establish and maintain a data base for automatic trunk testing to be known as the Trunk Maintenance File or TMF. At intervals governed by the number of changes and other local conditions, new cards or tapes should be issued to update the control media in each office.

1.25 Procedures to be followed at Tape and Card Administration Centers are described in Parts 10, 11, and 12. These procedures cover three different methods of tape and card preparation.

(a) A manual/mechanized process suited to a relatively small operation.

(b) A small computer process suitable for a somewhat larger operation. Use of the computer extends the workload that can be handled by the personnel and decreases the likelihood of error in the process.

(c) A process using a large computer with random access mass storage which is suitable for a high-volume tape and card production such as might be needed for an entire company.

These three processes are briefly described in Part 11. Input data forms designed to be used with these processes are provided in Part 10. One set of forms is designed for use with the manual/mechanized process and an alternate set of forms is designed for use with either of the computer processes. Tape identification and distribution are discussed in Part 12.

E. Intercompany and Interarea Arrangements

1.26 As an ultimate goal, each Tape and Card Administration Center should furnish ATMS control media for all trunks in its geographic area of responsibility whose switching machine appearances are assigned by the center's home company or area. This should be the case regardless of which company or area performs the circuit layout, trunk testing, or switching maintenance functions. The advantage

of this arrangement is that, except for test line numbers which change infrequently, only circuit layout record cards need be exchanged between companies. Since standards for circuit layout cards have been established in Section 682-000-011, intercompany exchange of information can be on a standard basis. Other reasons for this recommendation as well as the implications involved are discussed in Part 11. It may be impractical in the beginning for various reasons to organize the centers in this manner. However, in the long run, it is expected that such an arrangement will be the most efficient for all concerned.

2. STANDARD TAPES AND CARD DECKS

2.01 One of the key requirements for effective administration of ATMS control media at Tape and Card Administration Centers is the standardization of the tapes and card decks to be supplied to each office. Trunks should be arranged on the tapes or decks to aid in identifying troubles common to a facility or trunk group. Provision should be made to test each trunk in all of its modes of access and termination. The various testing intervals recommended in Section 660-402-300 for trunks on different types of facilities should be taken into account. In addition, the scoring of the ATMS deviation registers should be controlled in a manner that lends itself to easy computation of the Trunk Transmission Maintenance Index per Section 301-121-100. Figure 2 shows the recommended transmission test intervals and index requirements as they appear in the above sections of Bell System Practices.

2.02 To satisfy the requirements in 2.01 with a manageable number of tapes or card decks per office requires a judicious selection of which trunks to include on a given tape, the order in which these trunks should appear, and whether to score the deviation registers.

A. Transmission Test Tapes or Decks

2.03 The tapes or card decks designated T1 through T6 in Table 2 are the recommended standard transmission test tapes or decks to be provided by the center. The facility, contained within a given controlled trunk, which requires the shortest test interval determines on which of T1 through T4 that trunk will appear. Trunks not included in the Trunk Transmission Maintenance Index and modes of access not measured for the Index are on T5. All trunks appear a second time on T6 arranged in a different test sequence.

2.04 On T1 through T5, trunks are arranged by the first major specific facility nearest the originating office. Within each specific facility, trunks are arranged by channel number for carrier facilities or by trunk number for voice frequency facilities. A specific facility is here defined to be a particular cable or open-wire designation, type of voice frequency repeater, or channel group of a carrier system. Facility grouping on transmission testing is expected to reduce the time required to identify troubles common to a particular facility.

2.05 An optional arrangement is to group trunks by the first major specific facility from an adjacent office if this is of more assistance to the Plant forces in helping to locate possible troubles.

2.06 On T6, trunks are arranged by trunk group and within this grouping are arranged by first major specific facility and channel or trunk number (2.04).

2.07 T1 through T3 are used for index purposes and are composed of controlled trunks only. All entries on these tapes will score the deviation registers. Each indexed trunk appears on only one of the three tapes or decks. Three separate tapes or decks are provided because the index is divided among three test interval categories and this simplifies the index reporting job.

2.08 T4 is provided to simplify the task of testing controlled trunks which are recommended to be tested daily but for which results are to be scored for the index on a weekly basis. Therefore, T4 contains entries all of which also appear on T1 but does not score the deviation registers.

2.09 T5 is provided to simplify the task of testing trunks or modes of access which do not appear in the index. None of the entries on T5 appear on any of tapes T1 through T4. This tape should be run at least monthly.

2.10 T6 is provided as an adjunct to T1, T2, T3, and T5 which together contain one entry for each trunk and each mode of access in facility order. T6, on the other hand, contains one entry for each trunk and each mode of access and termination arranged in trunk group order. This tape is intended

to be used as required. If desired, T6 can be provided in individual tapes or decks so that a particular trunk group can be tested on request.

2.11 The required tapes should be provided for each ROTL office as an independent entity. Entries for trunks originating in one ROTL office should not be interleaved with those of another ROTL office or with the test frame office. However, a single tape may contain trunks from several ROTL offices controlled from the same test frame provided they are segregated by ROTL office.

B. Operational Test Tapes or Decks

2.12 Table 3 shows the tapes or cards to be provided for operational tests. The order for operational tests is by trunk group and trunk number. Tape or card deck T6 can be used for controlling operational tests in the No. 4 crossbar AOTT and ADOIT frames. In the case of the No. 5 crossbar APTT, operational test tapes in addition to those listed in Table 3 may be needed for testing various local conditions as listed in Section 218-220-302.

C. Standard Captions and Preambles

2.13 The standard preamble shown in Fig. 3 should be used to identify each tape or card deck and its results printout. The standard preamble appears at the beginning of each tape or deck and includes the common language name* of the originating office, the tape or deck type (T1, T2, etc) and the date of preparation. Following this, up to 240 characters of additional preamble information can be inserted. This includes any necessary characters required for control or identification (see Fig. 3). The 240-character limitation was established to define the amount of file space needed when computer files are used.

2.14 Standard captions, containing Bell System common language, should be used for all control decks or tapes. The use of standard captions simplifies the operation at the Tape and Card Administration Center and facilitates identification on test results printouts.

2.15 The standard caption is shown in Fig. 4. It consists of the common language circuit identification, the facility test group designation (from which the test interval is determined), the identification of the first major specific facility nearest the originating office, and the terminal location for that facility. The originating office name always appears before the name of the terminating office which may not be the order on the circuit layout record. For 2-way trunks this means that the caption format at one end is the reverse of the other end. The locations of the trunk number and channel number are governed by the particular test frame involved.

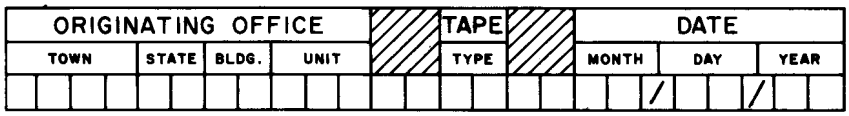
2.16 The same preambles and captions are used for both transmission and operational tests. The group caption precedes any listing of trunks for which the caption applies. If any of the items contained in the list change, such as facility test group, facility identification, or terminating office, a new caption is inserted. Sample printouts for each of the test frames illustrating the use of standard preambles and captions are shown in Parts 3 through 6. Tape and card preparation worksheets designed to produce these formats are in Part 10 including filled in examples for the specific sample printouts.

* Examples of common language terms used in this issue may not agree with the latest standard terminology. See the 005- and 795-divisions.

Recommended Transmission Test Intervals: SECTION 660-402-300, ISS 11
Trunk Transmission Maintenance Index Requirements: SECTION 301-121-100, ISS 2

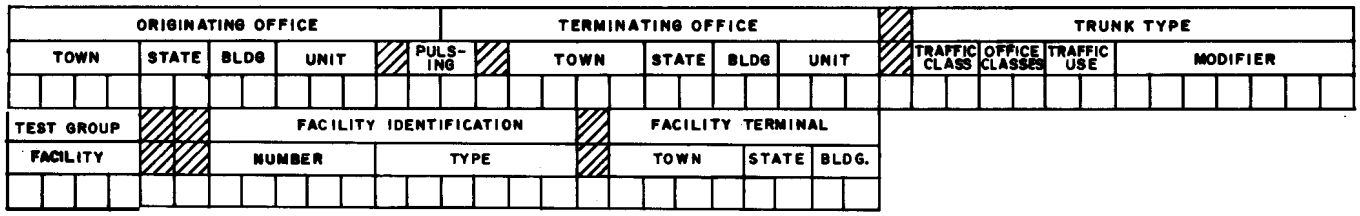
DAILY	WEEKLY
All Carrier not Included Under "Weekly"	L and R With Supergroup and Group Regulation N2, N3, or T1 Carrier
SEMI-MONTHLY	
Repeatered Trunks:	
a) Other than E-Type	(GROUP I OF INDEX)
b) E-Type	**MONTHLY**
(GROUP II OF INDEX)	Indexed: a) Nonrepeatered Voice Trunks
	Nonindexed: b) Noncontrolled Trunks c) Intrabuilding Trunks Without Gain d) Nonindexed Modes of Multiaccess and Multitermination Trunks

Fig. 2—Recommended Transmission Test Intervals and Index Requirements



Additional Preamble Information (Optional):
Tape Frames - 240 characters maximum, including CRT and LNF.
Card Frames - Three 78-character lines maximum.

Fig. 3—Standard Preamble Format



Tape Frames - 2 lines as shown.
Card Frames - 1 line: See Figure 23, part 10.

Fig. 4—Standard Caption Format

TABLE 2

TRANSMISSION TAPES AND CARD DECKS FOR EACH ORIGINATING OFFICE

TAPE OR CARD DECK TYPE	CONTENTS		ORDER (1)	DEVIATION REGISTERS	RECOMMENDED TEST INTERVAL (SECTION 660-402-300)
T1	Group I of Index (2)		Facility	Score	Weekly
T2	E Rep	Group II of (2) Index	Facility	Score	Semi Monthly
T3	Non Rep		Facility	Score	Monthly
T4 (3)	Daily		Facility	Not Score	Daily
T5	1 Noncontrolled 2 Nonindexed Access/Term. 3 Intraoffice		Facility	Not Score	Monthly
T6	All Interoffice		Trunk Group By Facility	Not Score	As Required

Note 1: Facility Order Implies:

(a) Carrier facilities are grouped by channel number within a common facility.

(b) Repeatered and nonrepeatered voice trunks are grouped within a common facility by traffic trunk number.

Note 2: Group I and Group II of the transmission maintenance index are explained in Fig. 2.

Note 3: The trunks in T4 are also included as part of T1. T1 through T4 contain controlled trunks only.

TABLE 3

OPERATIONAL TAPES AND CARD DECKS FOR EACH ORIGINATING OFFICE

TEST ARRANGEMENT	CONTENTS	ORDER
APTT 5XB	1 Tape For Busy Line Tests For Trunks To Common Control Office	Trunk Group
	1 Tape For 103 Tests	Trunk Group
	1 Tape For Test Line Tests	Trunk Group
AOTT SXS	1 Tape For Busy Line Tests For Trunks To Common Control Office	Trunk Group
	1 Tape For 103 Tests	Trunk Group
	1 Tape For Test Line Tests	Trunk Group
AOTT 4XB	No Tapes*	—
ADOIT 4XB	No Cards*	—
ROTL 5XB	1 Tape For Test Line Tests	Trunk Group
ROTL SXS	1 Tape For Test Line Tests	Trunk Group

*Operational tests can be run in a fixed (wired) sequence or the transmission test tapes or decks can be used.

3. NO. 5 CROSSBAR APTT FRAME

3.01 Part 3 describes the input information required by the Automatic Progression Trunk Test (APTT) frame and its tape and printout formats. The description is for a frame equipped with the ATMS director and with optional ROTL control features in accordance with Issue 43A of SD-25938-01. The information on an input tape has been divided into four types. Table 4 lists the APTT frame terminology that is commonly used to refer to these four information types.

Each individual trunk test record consists of these types of input information in one of the four following combinations:

(a) Caption + Marker, Transmission, and Trunk Priming

(b) Caption + Transmission and Trunk Priming (when marker priming is the same as for the preceding trunk record)

(c) Caption + Marker and Trunk Priming (when transmission priming is the same as for the preceding trunk record)

(d) Trunk Priming (when caption and marker and transmission priming are the same as for the preceding trunk record).

3.02 The APTT frame uses 5-level paper tape and 28B teletypewriter equipment with a modified type A keyboard for input and output. The test frame will automatically progress through all of the trunk test records on an input tape. Test procedure instructions which determine the type of test to be made are given to the APTT frame via key settings and via marker priming on the input tape. The key settings must be consistent with the marker priming on the input tape. The APTT frame is shown in SD-25938-01. Input data requirements are given in Sections 218-220-301 and 218-220-303.

3.03 The APTT frame is the only automatic trunk test frame that does not use a test connector. The APTT frame has appearances on both the line link and the trunk link frames and gains access to a trunk or line by using the common control equipment. To do this, the APTT frame requires more input information than any other test frame. The frame can be wired and controlled by input tape to test trunks in a No. 5 crossbar office except switchboard-terminated trunks and some CAMA trunks with ONI. The frame can also perform maintenance checks on test lines in its own office.

3.04 Identifying information is used to put a preamble at the beginning of an input tape and to put a standard caption before each group of trunks with common information in the test sequence. The format and usage of preambles and captions are discussed in Part 2 and are illustrated in Fig. 5.

A. Identifying Information

3.05 Identifying information is essentially unrestricted for the APTT frame. The only constraints are that no more than 80 characters can be printed per line and that a quote character ("—upper case Z) cannot be used. The quote character ("—upper case Z) is the stop copy control character to be used at the end of an identification data field. The start copy control character is a number sign (#—upper case H).

B. Test Procedure Instructions

3.06 This input information is called marker priming in APTT frame terminology. Although the type of test to be made is determined by key settings, the marker priming is required to condition the No. 5 crossbar common control equipment to gain access to trunks in a particular mode for particular

tests. Included in the marker priming is the directory number of the far end test line or, for a test via ROTL, the directory number of the ROTL. When preparing an input tape, marker priming is punched as part of the first trunk record in each sequence of trunks requiring the same marker priming. The test frame will store this information and use it for all the trunks in that sequence. The marker priming format on input and output tapes is listed in Table 5 and is described in the following paragraphs.

3.07 ***RMP—Release Marker Priming:*** This is the APTT frame marker priming control character. This apostrophe character ('—upper case J) instructs the frame to clear previously stored marker priming and to steer the succeeding digits into the marker priming registers.

3.08 ***CRT, LNF—Teletypewriter Control Characters:*** CARRIAGE RETURN and LINE FEED are ignored by the APTT frame and are included just to set up the teletypewriter page printer.

3.09 ***FIG—Input Data Control Character:*** FIGURES SHIFT is the APTT frame control character that causes the succeeding digits to be registered by the frame.

3.10 ***MKG—Marker Group Number:*** This entry specifies the number of the marker group through which the APTT frame must gain access to the trunk to be tested. The APTT frame can serve a maximum of three marker groups. For tests via ROTL, this digit specifies the number of the marker group for trunks which can be used to reach the ROTL.

3.11 ***TMT, TMU—Translation Marks:*** This entry determines how the following 10-digit entry field is to be translated and whether the APTT frame is to appear to the marker as an originating line or as an incoming trunk. It will appear as a line if TMT = 0 and as trunk if TMT = 1. The units digit, TMU, may be 0 through 9 and each possible entry is defined in Table 5. This digit also satisfies any toll call screening that may be used in the office.

3.12 ***A, B, C, OA/DDA, OB/DDB, OC/DDC, NTH, NH, NT, NU—Terminating Test Line Number:*** The entry in this field is the directory number of the far end test line or, for a test via ROTL, the ROTL directory number. There are seven formats for interpretation of this field. (See Table 5.)

3.13 ***X—Extra Information:*** This entry is zero for all direct transmission tests by the APTT. When testing via ROTL, this entry must be 7 if a transmission test is to be made. The 10X-type test lines in the same office as the APTT frame can be tested by the frame when a 3 is put in the X entry. The other X entry digits for operational tests on line-link pulsing circuits, centrex trunks, and CAMA incoming trunk circuits are explained in Table 5.

3.14 ***CLT, CLU—Trunk Class*:*** This information sets up the APTT frame to use the type of supervision required by the trunk to be tested. With the X entry, this information also conditions the frame to work with the logic of the switching system in gaining access to the various trunks. The possible Trunk Class entries are defined in Table 5.

* For tests via ROTL, these digits refer to the access route rather than the trunk to be tested.

3.15 ***TIT, TIU—Test Information:*** This information identifies the type of trunk test to be made and the type of far end equipment to be used. This entry should correspond to the trunk class entry in 3.14. Table 5 defines the possible entries.

3.16 ***AGRA—Allotter Group and Route Advance Steering*:*** This information is passed on to the marker as part of the data that achieves access to a specific trunk. For line link pulsing trunks allotted between number groups, it must be specified to which of up to eight number groups the desired trunk is connected. In the case of trunks other than line link pulsing trunks, groups of more than 20 trunks per trunk link frame are allotted to two "Allotter Groups." To gain access to a trunk in such a

group it must be specified to which allotter group the desired trunk is connected. Further, some trunks are assigned to a common final trunk group to which access can only be gained by a "route advance." This occurs in the all-trunks-busy condition on a high-usage group. To test such an alternate route trunk, the marker must be instructed to make a route advance step. (See Table 5.)

3.17 ***CRG, CRU—Rate Treatment Class*:*** This entry supplies information required by common control equipment in offices equipped with rate treatment. If the office does not have rate treatment, then the APTT frame will not accept these two digits and they must not be on the input paper tape. If the office is equipped with rate treatment, they are also omitted from the tape in four cases: (a) when testing CAMA incoming trunk circuits, (b) line-link pulsing trunks, (c) tandem trunks, and (d) intertoll trunks.

3.18 ***CST, CSU—Class of Service*:*** This entry is passed on to the marker as a class-of-service code. No. 5 crossbar machines can gain access to trunks in three modes: (a) local originating, (b) through-switched intertoll, and (c) through-switched tandem. To gain originating access, the class of service must match that of the trunk or the marker will not make the connection. When gaining access in the through-switched mode, the class-of-service data is used to select the proper screening to be used in the marker. When making operational tests on CAMA incoming trunk circuits, these two digits are not included in the marker priming. The CAMA information that the APTT frame will store in place of the CST, CSU digits is different for each trunk. Therefore, these two digits are moved to the trunk priming data field and called ASN and ASH. These digits will be described in 3.34.

* For tests via ROTL, these digits refer to the access route rather than the trunk to be tested.

C. Transmission Testing Parameters

3.19 This input information is called transmission priming and is passed from the APTT frame to the ATMS director to set the director up for making a transmission test. When preparing an input tape, transmission priming is punched as part of the first trunk record in each sequence of trunks requiring the same transmission priming. The test frame stores this information and uses it for all trunks in that sequence. These entries are omitted from a tape to be used for operational testing. The tape format for transmission priming information is listed in Table 6 and is described in the following paragraphs.

3.20 ***RTP—Release Transmission Priming:*** This is the APTT frame transmission priming control character. This left parenthesis character [(—upper case K] instructs the frame to clear previously stored transmission priming and to steer the succeeding digits into the transmission priming registers.

3.21 ***CRT, LNF—Teletypewriter Control Characters:*** CARRIAGE RETURN and LINE FEED are ignored by the APTT frame and are included just to set up the teletypewriter page printer.

3.22 ***FIG—Input Data Control Character:*** FIGURES SHIFT is the APTT frame control character that causes the succeeding digits to be read by the frame.

3.23 ***FE—Far End Test Line Type:*** This entry is either 0, 2, 4, or 5 indicating a 100-, 102-, 104-, or 105-type test line, respectively, at the far end. The APTT frame notes this entry as it is passed to the ATMS director and makes use of it to determine which answer signal and test timing to expect when the far end test line has been reached.

3.24 ***TPL—Test Pad Loss:*** This entry is a 0 if the trunk is to be tested without a test pad (TP0), or a 2 if the trunk is to be tested through a 2-dB pad (TP2).

3.25 ***EML—Expected Measured Loss:*** These three digits are treated as if there were a decimal point between the last two. The recommended range of entries is 00.0 through 11.3 dB. Any value in this range in 0.1-dB steps is permissible. EML entries greater than 11.3 dB may be used, but the

maximum positive deviation that can be printed will be limited in such cases because the maximum loss that the ATMS director can measure is about 15 dB. When testing to 104-type test lines, the near-to-far loss is based on a measurement by the director of the sum of the near-to-far and far-to-near losses. If this sum exceeds about 15 dB, the positive deviation of the near-to-far loss which can be printed will be limited, resulting in a printout of +?? and a (possibly erroneous) cue 2.

3.26 ***Loss Deviation Limit:*** These two digits are treated as if there were a decimal point between them. Only ten values can be entered as loss deviation limits: 0.4, 0.6, 0.8, 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, and 3.5 dB.

3.27 ***Noise Maintenance Limit:*** The noise maintenance limit can be any number in the range 20 through 48 dBrnC in 1-dB steps.

3.28 ***NDL—Noise Deviation Limit:*** A zero should always be entered for this limit.

3.29 ***Noise Immediate Action Limit:*** The noise immediate action limit can be any of 10 even numbers: 30, 32, 34, 36, 38, 40, 42, 44, 46, or 48 dBrnC.

3.30 ***DR—Deviation Registers:*** This entry is a 1 if the loss and noise deviation measurements are to be scored on the ATMS deviation registers or a 0 if the measurements are not to be scored.

D. Trunk Access Instructions

3.31 This input information is called trunk priming in APTT frame terminology. The trunk priming specifies information that is unique to each trunk. For regular tests made by the APTT frame, the trunk priming provides the data needed to direct the marker to provide access to the particular trunk to be tested. In tests via ROTL, the trunk priming provides the five digits that will instruct the ROTL to gain access to the trunk to be tested. No control character other than FIGURES SHIFT precedes each trunk priming. The tape format for trunk priming is listed in Table 7 and is described below.

3.32 ***CRT, LNF—Teletypewriter Control Characters:*** CARRIAGE RETURN and LINE FEED are ignored by the APTT frame and are included just to set up the teletypewriter page printer.

3.33 ***FIG—Input Data Control Character:*** FIGURES SHIFT is the APTT frame control character that unlocks the steering chain so that the following digits will be read.

3.34 ***ASN, ASH—CAMA Access Switch:*** This entry is used only on input tapes for testing CAMA incoming trunk circuits. The first digit identifies a CAMA access switch and the second digit specifies an access switch hold magnet. If ASN and ASH are present in the trunk priming, CST and CSU will not be present in the marker priming.

3.35 ITH, IHT, ITT, IUT—***Intermarker Group Trunk Data:*** This entry is passed on to the marker to direct it to connect to a particular intermarker group trunk. For CAMA intermarker group trunks, all four digits are used. For line-link pulsing circuits, only IHT and ITT are used; ITH and IUT are omitted. For all other trunk tests, all four digits are omitted.

3.36 ***Trunk Number:*** This entry is simply reproduced on the teletypewriter for identification. This is the number assigned to the trunk by Traffic. If the number is less than four digits, periods (.–upper case M) must be entered into the unused leading positions. This is symbolic data rather than numeric data. The trunk number 0003 is different from the trunk number .003, or ..03, or ...3.

3.37 ***FT, FU, TT, TU—Trunk Location Address:*** For tests made directly by the APTT frame, four digits follow the trunk number and are interpreted as follows. The first two digits, FT and FU, give the trunk link frame location. (The FT digit is referred to as the Frame Tens and Called Digits

entry, FTCD, on earlier issues of the APTT frame.) The second two digits, TT and TU, identify the busy test lead of the trunk, except for CAMA incoming trunk circuits and line-link pulsing trunks. See Table 7 for description of these entries. TT and TU are not required for tests to 10X-type test lines in the same office as the APTT frame. See Table 8 for relationship between the trunk location address and the trunk machine appearance as assigned by Traffic. This relationship is given in detail in Fig. 33 and 34, Part 10, to aid in converting machine appearances to trunk location address data. In offices using the small crossbar switches, the relationship between the machine appearance and the trunk location address data is flexible. Therefore, in such offices, the busy test lead assignments for each specific trunk must be obtained for each individual office concerned.

3.38 ***RDA, RDB, RDC, RDD, RDE—ROTL Priming:*** For tests via ROTL, five digits follow the trunk number and are interpreted as ROTL control data instead of as trunk location address. Once the ROTL has been seized, these five digits will be transmitted to the ROTL to initiate a test. After each test, the ROTL will release the trunk that was tested but the connection to the ROTL will be held until new marker priming is read. See Parts 7 and 8 for digits to be used.

3.39 ***Channel Number:*** If the facility identification in the caption specified a carrier system, enter a number sign (#—upper case H) followed by the 2-digit channel number assigned to the trunk. Follow this by a quote character ("—upper case Z).

E. Data Formats on Tapes and Printout

3.40 The input information is put on the paper tape in the order described in the preceding paragraphs. Spaces are added to make the data format more readable. Figure 5 is a sample printout of one of the standard tapes for an APTT frame. Tape Preparation Worksheets for the APTT, designed to be used in preparing the standard tapes described in Part 2, are provided in Part 10. Figure 20, Part 10, shows a Tape Preparation Worksheet filled in to produce the printout in Fig. 5.

TABLE 4

THE FOUR TYPES OF INPUT INFOMATION IN AN APTT FRAME TRUNK TEST RECORD

INPUT INFORMATION TYPES	APTT TERMINOLOGY
1 Identifying Information	— Caption Information
2 Test Procedure Instructions	— Marker Priming
3 Transmission Testing Parameters	— Transmission Priming
4 Trunk Access Instructions	— Trunk Priming

TABLE 5

AUTOMATIC PROGRESSION TRUNK TEST FRAME MARKER PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION		PRIMING DIGITS	
RMP	Release Marker Priming Control Character		'	
CRT LNF	Carriage Return Line Feed } Teletypewriter Control Character		< =	
FIG	Figures Shift		⮝	
MKG	Marker Group Number		0, 1, or 2	
TMT and TMU	Translation Marks Tens and Units		TMT	TMU
	Local Originating Test Mode	7 Digit Called Number, No Prefix	0	0
		7 Digit Called Number, Prefix 1	0	2
		7 Digit Called Number, Prefix 11	0	4
		7 Digit Called Number, Prefix 8	0	8
		10 Digit Called Number, No Prefix	0	1
		10 Digit Called Number, Prefix 1	0	3
		10 Digit Called Number, Prefix 8	0	9
		6 Digit Called Number, 2 Digit Office Code	0	5
		5 Digit Called Number, Centrex	0	6
		4 Digit Called Number, Centrex	0	7
	Toll or Tandem Through-Switched Test Mode	7 Digit Called Number*	1	0
		7 or 10 Digit Called Number**	1	1
		6 or 10 Digit Called Number**	1	2
		5 or 10 Digit Called Number**	1	3
		4 Digit Called Number, OA lead grounded	1	4
		4 Digit Called Number, OB lead grounded	1	5
		4 Digit Called Number, PHC lead grounded	1	6
		4 Digit Called Number, THC lead grounded	1	7

* Local Translator Needed (LT Lead Grounded)
** Toll Translator Needed (TT Lead Grounded)

TABLE 5 (Cont)

AUTOMATIC PROGRESSION TRUNK TEST FRAME MARKER PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION	PRIMING DIGITS
	Terminating Test Line Number or ROTL Number	
A	10 Digit Number	XXX XXX XXXX
B	7 Digit Number	XXX 000 XXXX
C	7 Digit Number, CAMA calls	XXX XXX XXXX
OA/DDA	(Called Office, Calling Office, Called Line)	
OB/DDB	6 Digit Number, 2-Digit Office Code	XX0 000 XXXX
OC/DDC	5 Digit Number	X00 000 XXXX
NTH	4 Digit Number, Centrex	000 000 XXXX
NH	4 Digit Number, Automatic Intercept	XXX 000 X000
NT NU	*Note:* For Code 10X Terminating Test Lines, the Last Four Digits are 10X0** X = Any Digit 0 through 9 0 = Filler Digit 0	
X	Extra Information	
	Filler Digit for all Tests Except CAMA,* Home Office Test, Test via ROTL Line Link Pulsing, Centrex	0
	CAMA:* Local Completion	4
	Tandem Completion	5
	Toll Completion	6

* ie, Tests of CAMA Trunk Circuits

** In the case of Code 10X test lines, it is still necessary to enter appropriate area and office codes because the marker performs a translation on these digits in the process of locating the desired trunk group.

TABLE 5 (Cont)

AUTOMATIC PROGRESSION TRUNK TEST FRAME MARKER PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION		PRIMING DIGITS	
X (Cont)	Test of Home Office Test Lines		3	
	Test via ROTL		7	
	Line Link Pulsing: Reverse Battery Supervision		4	
	E&M Lead Supervision		7	
	Centrex: IAO Trunk — No Transfer Feature Repeated Supervision Test		4	
	IAO Trunk with Transfer Feature		7	
CLT and CLU	Trunk Class Tens and Units		CLT	CLU
	Local Trunks (Outgoing or IAO)	Flat Rate	0	1
		Message Register All Non-wire Spring-Relay Type Trunks and Wire-Spring Relay Type with 1st 4-IPM Interrupter	0	2
		Wire-Spring-Relay Type Trunks with 2nd 4-IPM Interrupter	0	6
		Coin All Non-wire Spring-Relay Type Trunks and Wire-Spring-Relay Type Trunks with 1st 4-IPM Interrupter	0	4
		Wire-Spring-Relay Type Trunks with 2nd 4-IPM Interrupter	0	5
		AMA Arranged to Initiate Disconnect Entry	0	3
		Arranged to Omit Disconnect Entry	0	7
		ANI	0	8

TABLE 5 (Cont)

AUTOMATIC PROGRESSION TRUNK TEST FRAME MARKER PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION		PRIMING DIGITS	
			CLT	CLU
CLT and CLU (Cont)	Outgoing Toll Trunks	Through Switch Operation (from Toll Originating Test Line)	0	0
		Flat Rate — Subscriber Access	1	9
		AMA — Subscriber Access	0	9
	Tandem Through Switch Operation (Tandem Originating Test Line)		2	1
	Line Link Pulsing or Home Office Test		1	7
	Data AMA Operation Data Message		1 1	5 6
	CAMA Trunk Circuits	Incoming: Operator Identified Automatically Identified	1 1	0 1
		Junctor	1	2
		Intermarker Group: Arranged to Initiate Disconnect Entry Arranged to Omit Disconnect Entry	 1 1	 3 4
	CCSA Trunk (Subscr. Access)	No Repeated Supervision to Local Customer AMA Flat Rate	 0 1	 9 9
		Repeated Supervision to Local Customer AMA Flat Rate Centrex Transfer Feature in Distant Office Trunk	 2 2 3	 9 8 1
	CCSA Trunk — Tandem Access (103 Test)		3	0

TABLE 5 (Cont)

AUTOMATIC PROGRESSION TRUNK TEST FRAME MARKER PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION		PRIMING DIGITS	
			CLT	CLU
CLT and CLU (Cont)	CCSA Off-Net Access Lines	Subscriber Access	0	3
		Tandem Access (103 Test)	3	0
		Junctor Circuit Used as Off-Net Access Line (LONAL)	3	2
	Centrex	IAO Trunk, No Repeated Supervision; Transfer Test of Distant Office Incoming Centrex Trunks; or Home Office Centrex Test Line	1	8
		IAO Trunk, Repeated Supervision	2	0
		Toll Through-Switched Operation to Centrex Transfer Line	3	3
		Coin Only Trunks to Centrex Transfer or Don't Answer Transfer Test Line	3	4
	Automatic Intercept Service Trunk		2	7

TABLE 5 (Cont)

AUTOMATIC PROGRESSION TRUNK TEST FRAME MARKER PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION					PRIMING DIGITS	
TIT and TIU for Operational Tests	Test Information Tens and Units					TIT	TIU
	TYPE OF TRUNK	TEST SWITCH POSITION					
		TL	RTL	CP	BL		
	Outgoing Trunks to Dial Office	ITDO Test to Synch Test Line	OGT Test	Continuity and Polarity Test	Busy Line Test	0	0
		ITDO Test to Non-Synch Test Line				0	1
		ITDO Test to Step-by-Step Test Line			Pass By	0	2
	Intermarker Group, Subscriber to Subscriber Trunks, Reverse Battery Trunks, or Outgoing Junctors	Pass By		Pass By	Busy Line Test	0	3
	Outgoing Trunks to Manual Office (PCI)			Continuity and Polarity Test	Pass By	0	4
	Line Link Pulsing Circuits			Pass By			

TABLE 5 (Cont)

AUTOMATIC PROGRESSION TRUNK TEST FRAME MARKER PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION		PRIMING DIGITS	
			TIT	TIU
TIT and TIU for Operational Tests (Cont)	Intraoffice (IAO) Trunk Test		0	5
	Subscriber to Subscriber Trunks — IAO Test — Intermarker Group to MG0 — Intermarker Group to MG100 — Intermarker Group to MG200		 0 0 0	 6 7 8
	Toll Class Test to Code 103 Termination		0	9
	CAMA Trunk Circuit Test	Non-Bylink Incoming Trunk — Ground Shunt	1	0
		Non-Bylink Incoming Trunk — No Ground Shunt	1	1
		Bylink Incoming — E&M Supervision — Loop Signaling 0-1750 Ohm Loop — 1000 Ohm Compensation Required 1750-4200 Ohm Loop — 1000 Ohm Compensation Not Required — Code Selection or Intramural Trunk	 1 1 1 1	 2 3 4 5
		Intermarker Group or Junctor	1	6
TIT and TIU For Transmission Tests	Test to Code 100, 102, 104, 105 Test Term. — Toll Class (Toll Orig. Test Line) — Subscriber Class (Local Orig. Test Line)		 0 2	 9 9
	Test to Local Office 10X-Type Test Line 100-Type Combined Milliwatt — Balance 102-Type: Milliwatt Supply 104-Type: Trans. and Noise Check 105-Type: ATMS Responder		 2 1 1 1	 0 9 7 8

TABLE 5 (Cont)

AUTOMATIC PROGRESSION TRUNK TEST FRAME
MARKER PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION			PRIMING DIGITS	
AGRA	Allotter Group and Remote Advance Steering				
	Line Link Pulsing Trunks	Trunk Group not Allotted Between Number Groups		0	
		Trunk Group Allotted Between Number Groups	NGT A	1	
			NGT B	2	
			NGT C	3	
			NGT D	4	
			NGT E	5	
			NGT F	6	
			NGT G	7	
			NGT H	8	
	Other Trunks	Trunk Allotter Group	No. of Route Advances		
		A or None	0	4	
			1	5	
			2	6	
		B	0	7	
			1	8	
			2	9	
CRG and CRU	Rate Treatment Class Group and Units			CRG	CRU
	Rate Treatment Class Group A			0	0-9
	Rate Treatment Class Group B			1	0-9
	Note: Obtain this information from Marker Cross-Connections. Under certain conditions, these digits are omitted from the tape. See 3.17.				

TABLE 5 (Cont)

AUTOMATIC PROGRESSION TRUNK TEST FRAME
MARKER PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION			PRIMING DIGITS
CST	Local Originating Test Mode: Class of Service Tens Digit for Local Originating Test Line (Obtain information from Office Records)			0-9
	Toll or Tandem Through-Switched Test Mode	Trunk No. Thousands Digit of APTT Appearance of Toll and TDM Originating Test Line	Class Group Lead Grounded to Marker	
			TCA	0
			TCB	1
			TCC	2
		Office Arranged for Maximum of:		
		2000 Trk No. 4000 Trk Nos.	TCA	3
		0 Note 1	TCB	4
		1	TCC	5
CSU	Local Originating Test Mode: Class-of-Service Units Digit for Local Originating Test Line (Obtain information from Office Records)			0-9
	Toll or Tandem Through-Switched Test Mode	Class Lead Grounded to Marker	TAN	0
			TAN1	1
			TAN2	2
			TAN3	3
			TAN4	4
			TOL	5
			INC	6
			PCR	7
			PCD	8
			PCD1	9

Note 1: Trunk No. for toll and tandem testing is hardwired when a maximum of 4000 trunk numbers are provided.

TABLE 6

AUTOMATIC PROGRESSION TRUNK TEST FRAME TRANSMISSION PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION		PRIMING DIGITS
RTP	Release Transmission Priming Control		(
CRT LNF	Carriage Return Line Feed } Teletypewriter Control		< ≡
FIG	Figures Shift		⮝
FE	Far End Equipment	Milliwatt and Balance — 100-Type Milliwatt Supply — 102-Type Trans. & Noise Check — 104-Type ATMS Responder — 105-Type	0 2 4 5
TPL	No Test Pad Needed 2-dB Test Pad Needed		0 2
EML	Expected Measured Loss (Three digits read as XX.X). The recommended range of entries is 00.0 — 11.3 dB in 0.1 dB steps		000 through 113
LOSS DEV.	Loss Deviation Limit. (Two digits read as X.X). See Section 660-402-300.* One of the following values must be used: 0.4, 0.6, 0.8, 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, or 3.5 dB.		04 through 35
NOISE M.L.	Noise Maintenance Limit — May be any whole number in range from 20-48 dBrnc. Section 660-403-500**		20 through 48
NDL	Noise Deviation Limit — Use Zero		0
NOISE I.A.L.	Noise Immediate Action Limit. See Section 660-403-500.** One of the following values must be used: 30, 32, 34, 36, 38, 40, 42, 44, 46, or 48 dBrnc		30 through 48
DR	Do not score loss and noise deviation registers. Score loss and noise deviation registers.		0 1

* Section 660-402-300 gives loss deviation limit guides. Actual limits used are the option of the using office.

** If these limits are carried on the circuit layout card, the values on the card should be used.

TABLE 7

AUTOMATIC PROGRESSION TRUNK TEST FRAME
TRUNK PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION			PRIMING DIGITS
CRT LNF	Carriage Return Line Feed } Teletypewriter Control			< ≡
FIG	Figures Shift			⮝
ASN	CAMA Access Switch Number			
	Circuit Arranged for Up To 500 CAMA Trunks		Circuit Arranged for up to 1000 CAMA Trunks	
	Trunk No. Thousand Digit			
	0	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
	1	0 1 2 3 4	5 6 7 8 9	5 6 7 8 9
ASH	CAMA Access Switch Hold Magnet Number for CAMA Incoming and Intermarker Group Calls			0-9
ITH IHT, ITT, and IUT*	CAMA Intermarker Group Trunk Number-Thousands Digit, Hundreds Digit, Tens Digits, and Units Digit.			0000 3999
	Line Link Pulsing-Tens Digit and Units Digit of Tens Block in Number Group (ITH and IUT Not Used in This Case).			00 -99

* These entries are automatically bypassed unless CAMA Intermarker Group Trunks or Line Link Pulsing Trunks are being tested.

TABLE 7 (Cont)

AUTOMATIC PROGRESSION TRUNK TEST FRAME
TRUNK PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION	PRIMING DIGITS
TRUNK NUMBER	Traffic Assigned Trunk Number-4 Digits. If Assigned Trunk Number is Less Than 4 Digits, Use Periods (Upper Case M) in Leading Position. eg, . . 45	0000 -9999

TESTS MADE DIRECTLY BY APTT:

FT FU TT and TU/SSN	Trunk Location Address for all Trunks Except as Below	Trunk Link Frame Location Tens and Units	FT FU	0-2 0-9
		Trunk Location Within Block of 20 Trunks (Busy Test Lead)	TT TU	0-1 0-9
	CAMA Incoming Trunk Circuits*	Filler Digits	FT FU	0 0
		Up to 500 CAMA Trunks	TT	0
		Up to 1000 CAMA Trunks: If Trunk No. Thousand Digit = 0 If Trunk No. Thousand Digit = 1	TT	0 1
		Access Switch Select Magnet Units	SSN (TU)	0-9
	Line Link Pulsing Trunks	Filler Digits	FT FU	0 0
		Sleeve Lead Tens 0 Sleeve Lead Units	TT TU	0 0-9

* The CAMA trunk thousands digit is entered as part of the access switch number (ASN) when the circuit is arranged for less than 500 CAMA trunk circuits and as the trunk tens digit when arranged for more than 500 CAMA trunk circuits.

TABLE 7 (Cont)

AUTOMATIC PROGRESSION TRUNK TEST FRAME
TRUNK PRIMING INFORMATION

ENTRY DESIG	ENTRY DESCRIPTION	PRIMING DIGITS
TESTS VIA ROTL:		
RDA RDB RDC RDD and RDE	See Part 7 for Priming Digits for Number 5 Crossbar ROTL See Part 8 for Priming Digits for Step-by-Step ROTL	
Following the TU or the RDE Digit:		
STC	Start Copy Control Character	#
SPA	Space	
CHAN NO.	Channel Number — Two Digits	
SPC	Stop Copy Control Character	"

TABLE 8

NO. 5 CROSSBAR – RELATIONSHIP BETWEEN TRUNK MACHINE ASSIGNMENT AND TRUNK LOCATION ADDRESS

TRUNK EQUIPMENT ASSIGNMENT AS MADE BY TRAFFIC					
TRUNK LINK FRAME	APPEARANCE		SWITCH	LEVEL	
	LARGE SWITCH	SMALL SWITCH		LARGE SWITCH	SMALL SWITCH
00 Through 29	A (level 0) or B (level 1)	A B	0 Through 9	2 Through 9	0 Through 9

Translates to:*

TEST FRAME PRIMING – TRUNK LOCATION ADDRESS	
TRUNK LINK FRAME (FT, FU)	BUSY TEST LEAD (TT, TU)
00 Through 29	00 Through 19

* In No. 5 XB offices with Trunk Link SD-26032-01 with YG option, large or small switches use above chart.

In No. 5 XB offices with Trunk Link SD-26032-01 with YF option, levels 2 through 5 are flexible and busy test lead assignment for each specific trunk must be obtained from office records, for large or small switches. Levels 0, 1, 6 through 9 use above chart.

In No. 5 XB office with Trunk Link SD-27879-01 the relationship is flexible for all levels and busy test lead assignment for each specific trunk must be obtained from office records.

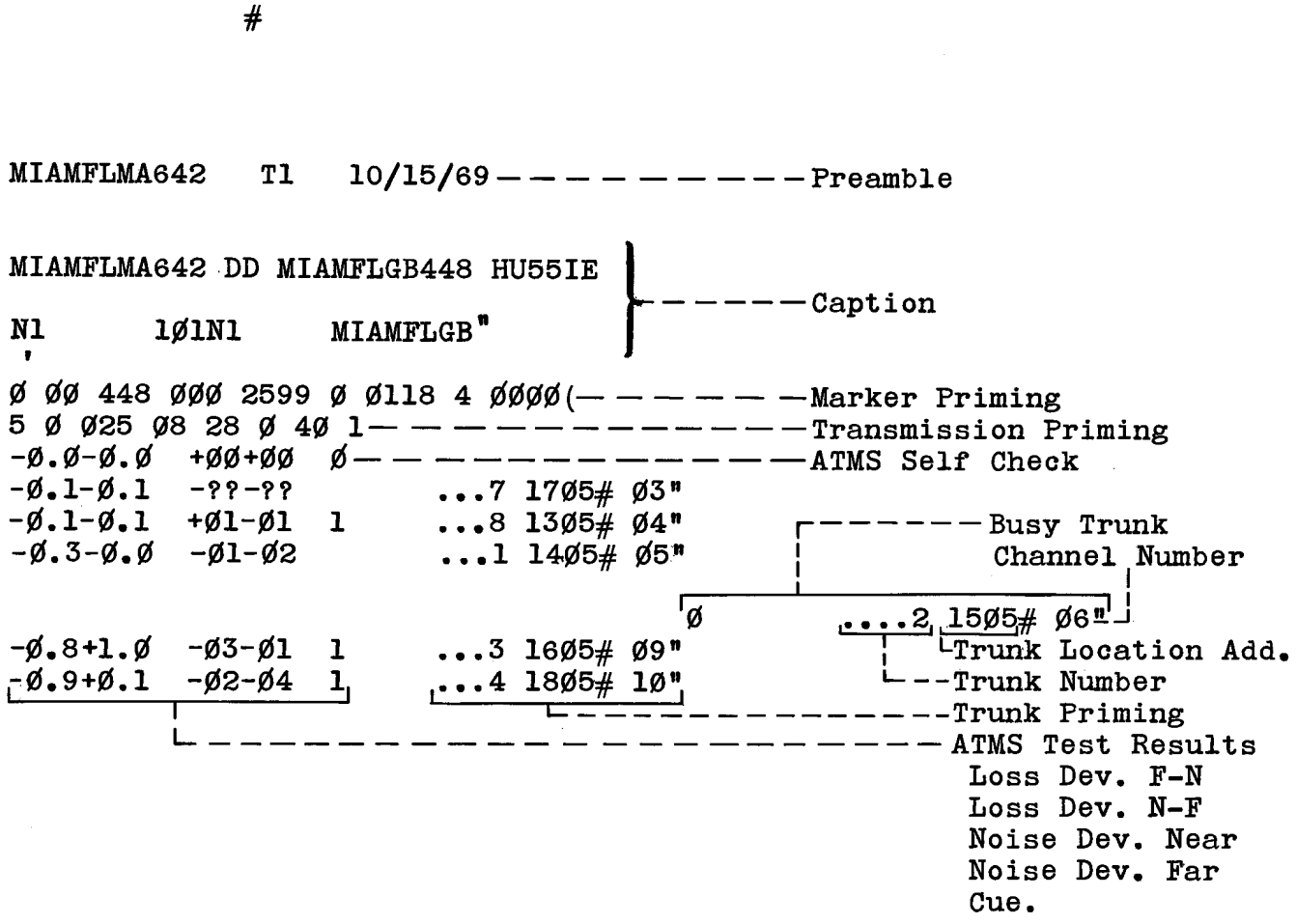


Fig. 5—No. 5 Crossbar APTT Frame—Sample Printout

4. STEP-BY-STEP AOTT FRAME

4.01 Part 4 describes the input information required by the Automatic Outgoing Trunk Test (AOTT) frame for step-by-step switching systems. This test frame is equipped with the ATMS director and with optional ROTL control features. The information on an input tape has been divided into four types. Each information type will be described separately. Table 9 lists the AOTT frame terminology that is commonly used to refer to the four information types.

TABLE 9

THE FOUR TYPES OF INPUT INFORMATION IN A SXS AOTT FRAME TEST RECORD

INPUT INFORMATION TYPES	AOTT TERMINOLOGY
1. Identifying Information	— Caption Information
2. Test Procedure Instructions	— Trunk Group Priming
3. Transmission Test Parameters	— Trunk Group Priming
4. Trunk Access Instructions	— Trunk Priming

Each trunk test record is composed of these types of information in one of the following combinations:

(a) Caption and Trunk Group Priming and Trunk Priming

(b) Caption and Trunk Priming (when trunk group priming is the same as for the preceding trunk record)

(c) Trunk Priming (when caption and trunk group priming are the same as for the preceding trunk record)

4.02 The AOTT frame uses 5-level chadless paper tape and a 28B teletypewriter with a modified type A keyboard for input and output. The frame will automatically progress through all of the trunk test records on an input tape. The type of test to be made is controlled by entries on the input paper tape. The keys on the AOTT frame control panel only select retest and printout modes. All trunk group priming and trunk priming information is punched on the input tape. The AOTT frame is shown in SD-32504-01. Input data requirements are given in Section 226-591-300.

4.03 The AOTT frame uses a test connector to gain access to the trunks to be tested. A 4-digit number is required to direct the test connector to connect to the tip, ring, and sleeve leads of the trunk to be tested. Access to a maximum of 9600 trunks is provided. The frame can automatically test all types of outgoing trunks in a step-by-step office except trunks that terminate in a switchboard at the far end and some types of CAMA trunks without ANI.

A. Identifying Information

4.04 Identifying information is used to put a preamble at the beginning of an input paper tape and to put a standard caption before each group of trunks having common priming. The format and use of preambles and captions are discussed in Part 2 and are illustrated for the AOTT in Fig. 6.

4.05 Identifying information is essentially unrestricted for the AOTT frame. The only constraints are that no more than 80 characters can be printed per line and that the combination of a FIGURES SHIFT immediately followed by a dollar sign ($—upper case D) cannot be used in a caption.

4.06 To begin identifying information, a FIGURES SHIFT and a LETTERS SHIFT must be punched the tape. This causes the test circuit to be disconnected from the teletypewriter transmitter distributor.

B. Test Procedure Instructions and Transmission Testing Parameters

4.07 For the AOTT frame, the test procedure instructions and transmission testing parameters are combined and called trunk group priming. The entries required for trunk group priming are described in Tables 10 and 11. The first 23 characters of trunk group priming are referred to by their numbered position on the tape. The last set of characters in the trunk group priming is the directory number of the far end test line or, for a test via ROTL, the directory number of the ROTL. For a transmission test, digits 9 through 22 give the transmission testing parameters as listed in Table 11. When the trunk group priming is for an operational test, digits 9 through 22 give other test procedure instructions as shown in Table 10.

4.08 When preparing an input tape, trunk group priming is punched as part of the first trunk record in each sequence of trunks requiring the same trunk group priming. The test frame stores this priming until new information is received. An exclamation point (!—upper case F) precedes each new trunk group priming. This control character instructs the AOTT frame to clear previously stored trunk group priming from the relay registers and to store the digits that follow.

4.09 Far end test line or ROTL directory numbers consisting of up to 7 digits, plus the digit 1 prefix if required, can be used. Thus, the AOTT can control only ROTLs within its home NPA. A comma (,—upper case N) must precede the directory number. An end-of-number control character, the bell symbol (upper case S) must immediately follow the last digit of the directory number. Trunk access priming information must follow the end-of-number control character.

4.10 For transmission testing, the recommended range for the expected measured loss (entries 13, 14, and 15) is from 00.0 to 11.3 dB. EML entries greater than 11.3 dB may be used, but the maximum positive deviation that can be printed will be limited in such cases because the maximum loss that the ATMS director can measure is about 15 dB. When testing to 104-type test lines, the near-to-far loss is based on a measurement by the director of the sum of the near-to-far and far-to-near losses. If this sum exceeds about 15 dB, the positive deviation of the near-to-far loss which can be printed will be limited, resulting in a printout of +?? and a (possibly erroneous) cue 2.

C. Trunk Access Instructions

4.11 The trunk priming specifies information that is unique to each trunk. For regular tests made by the AOTT frame, the trunk priming provides the test connector number of the trunk to be tested. Table 14 indicates the relation between the assigned trunk appearance and the test connector number.

4.12 The entries to be made for trunk priming are listed in Table 12 for regular AOTT frame tests. The number sign character (#—upper case H) must be used to prime the AOTT to read each new trunk priming. A control sequence consisting of FIGURES SHIFT—dollar sign ($—upper case D)—exclamation point (!—upper case F) must follow the priming for the last trunk in each trunk group.

4.13 In tests via ROTL, the trunk priming provides the five digits that instruct the ROTL to obtain access to the trunk to be tested. The entries to be made for trunk priming are listed in Table 13 for tests via ROTL. The FIGURES SHIFT—dollar sign ($—upper case D) combination causes the frame to connect the test circuit to read the trunk priming data that follow. The number sign (#—upper case H) primes the frame to transmit the ROTL control digits to the ROTL. See Parts 7 and 8 for an explanation of ROTL priming. A control sequence consisting of FIGURES SHIFT—dollar sign ($—upper case D)—ampersand (&—upper case G) must follow the priming for the last trunk in each trunk group tested via ROTL.

D. Data Formats on Tapes and Printout

4.14 The input information is put on the input tape in the order shown in Tables 10 through 13. Tape Preparation Worksheets for the AOTT, designed to be used in compiling data for the standard tapes described in Part 2, are provided in Part 10. Figure 21, Part 10, shows a Tape Preparation Worksheet filled in to produce the sample printout shown in Fig. 6.

TABLE 10

AUTOMATIC OUTGOING TRUNK TEST FRAME TRUNK GROUP PRIMING

ENTRY DESIG	ENTRY DESCRIPTION			PRIMING
	Carriage Return Line Feed			< ≡
	Figures Shift			⮝
	Connect Test Frame to Output of Control Tape			$
	Clear Registers			!
1	Type of Test:	Operational		.
		Transmission		/
2	Test via ROTL?		Yes	1
			No	0
3	If Entry 2 = 1			0
	Filler (Used if Entry No. 2 = 0)			:
4	If Test via ROTL (Entry 2 = 1): Is Digit 1 Prefix Required?		Yes	1
			No	0
	If Test Made by Test Frame (Entry 2 = 0)			:
5	If Test Made by Test Frame (Entry 2 = 0)			0
	If Test via ROTL (Entry 2 = 1)			:
6†	Does Trunk Terminate in an Office Having Common Control Equipment?		Yes	1
			No	0
7†	Does Trunk Use MF Pulsing?		Yes	1
			No	0
8†	Does Trunk Use Simplex Signaling?		Yes	1
			No	0

†For tests via ROTL (Entry 2 = 1), enter colons for entries 6, 7, and 8.

TABLE 10 (Cont)

AUTOMATIC OUTGOING TRUNK TEST FRAME
TRUNK GROUP PRIMING

ENTRY DESIG	ENTRY DESCRIPTION			PRIMING
9	For Operational Tests Only (Entry 1 = .) See Table 11 for Transmission Tests.	Test to Synchronous Test Line?	Yes	1
			No	0
10		Test to Non-Synchronous Test Line?	Yes	1
			No	0
11		Test to 103-Type Test Line? (0 If entry 2 = 1)	Yes	1
			No	0
12		Is Trunk a Centrex Trunk?	Yes	1
			No	0
13		Busy Line Test? (0 If entry 2 = 1)	Yes	1
			No	0
14 Through 22		Enter Colons (Upper Case C)		:
23		Selector Rest Position		:
		Number Registration Control		,
AS BS CS DS ES FS GS HS		1- to 7-Digit Terminating Test Line Number or Code or ROTL Directory Number. Since the AOTT Reaches Outgoing Trunks via a Test Connector, Fewer than 7 Digits will be Required in Many Cases. An End of Number Control Character, Upper Case S (Bell Symbol), Must Immediately Follow the Last Digit.		Telephone Number or Code

TABLE 11

AUTOMATIC OUTGOING TRUNK TEST FRAME TRANSMISSION TESTING (ENTRY 1 = /)

ENTRY DESIG	ENTRY DESCRIPTION		PRIMING
9	Do Not Score Loss and Noise Deviation Registers		0
	Score Loss and Noise Deviation Registers		1
10	If Test via ROTL (Entry 2 = 1)		:
	If Test by Test Frame (Entry 2 = 0)	Meas. at 600 ohms	6
		Meas. at 900 ohms	9
11	Far End Equipment	Milliwatt and Balance — 100-Type	0
		Milliwatt Supply — 102-Type	2
		Trans. & Noise Check — 104-Type	4
		ATMS Responder 105-Type	5
12	No Test Pad Needed		0
	2-dB Test Pad Needed		2
13 14 15	Expect Measured Loss (Three Digits read as XX.X). The recommended range of Entries is 00.0 — 11.3 dB in 0.1-dB steps		000 through 113
16 17	Loss Deviation Limit. (Two Digits read as X.X). See Section 660-402-300.* One of the Following Values Must be Used: 0.4, 0.6, 0.8, 1.0, 1.2, 1.5, 2.0, 2,5, 3.0, and 3.5 dB		04 through 35
18 19	Noise Maintenance Limit — May be Any Whole Number in Range From 20-48 dBrnc. See Section 660-403-500.**		20 through 48
20	Noise Deviation Limit — Use Zero		0
21 22	Noise Immediate Action Limit. See Section 660-403-500.** One of the Following Values Must be Used: 30, 32, 34, 36, 38, 40, 42, 44, 46, 48 dBrnc.		30 through 48

* Section 660-402-300 gives loss deviation limit guides. Actual limits used are the option of the local office.

** If these limits are carried on the circuit layout card, the values on the card should be used.

TABLE 12

AUTOMATIC OUTGOING TRUNK TEST FRAME TRUNK PRIMING FOR REGULAR AOTT FRAME TESTS (ENTRY 2 = 0)

ENTRY DESIG	ENTRY DESCRIPTION	PRIMING
	Carriage Return } Teletypewriter Control	<
	Line Feed } Teletypewriter Control	≡
	Read Trunk Priming	#
	Trunk Location Address (Test Connector Number)	0000-9999
	Selector Rest Position	Space
	Traffic Assigned Trunk Number-4 Digits. If Assigned Trunk Number is Less Than 4 Digits, Use Periods (Upper Case M) in Leading Positions. eg, . . 45	0000-9999
		Space
	Channel Number (Where the Caption Specified a Carrier System)	00-99

After the Last Trunk in the Trunk Group

	Figures Shift	⍋
	Connect Test Frame to Output of Control Tape	$
	Clear Registers	!

TABLE 13

AUTOMATIC OUTGOING TRUNK TEST FRAME TRUNK PRIMING FOR TESTS VIA ROTL (ENTRY 2 = 1)

ENTRY DESIG	ENTRY DESCRIPTION	PRIMING
	Carriage Return Line Feed	< =
	Figures Shift	▲
	Connect Test Frame to Output of Control Tape	$
	Read Trunk Priming	#
	ROTL Trunk Location Address See Parts 7 and 8 of this Section	(5 Digits)
	Figures Shift	▲
	Letters Shift	▼
		Space
		Space
	Figures Shift	▲
	Traffic Assigned Trunk Number-4 Digits. If Assigned Trunk Number is Less Than 4 Digits, Use Periods (Upper Case M) in Leading Positions. eg, . . 45	0000- 9999
		Space
	Channel Number (Where the Caption Specified a Carrier System)	00- 99
After Last Trunk in Trunk Group		
	Figures Shift	▲
	Connect Test Frame to Output of Control Tape	$
	Clear Registers following ROTL Test	&

TABLE 14

STEP-BY-STEP OFFICES
RELATION BETWEEN TRUNK APPEARANCE AND TEST CONNECTOR ASSIGNMENT

Assigned Trunk Appearance[1]

TRUNK EQUIPMENT LOCATION	
(method of identification will vary)	
Translates to[2]	
TEST CONNECTOR ASSIGNMENT	
CONTROL CONNECTOR	**TRUNK CONNECTOR**
XX	XX

NOTES: 1. In some cases the trunk appearance is assigned only by the central office forces.

2. Trunk appearances and test connector assignments are directly cabled. Tape Administration Centers will require a record of these connections. A form designed for compiling this record is shown in Fig. 31, Part 10.

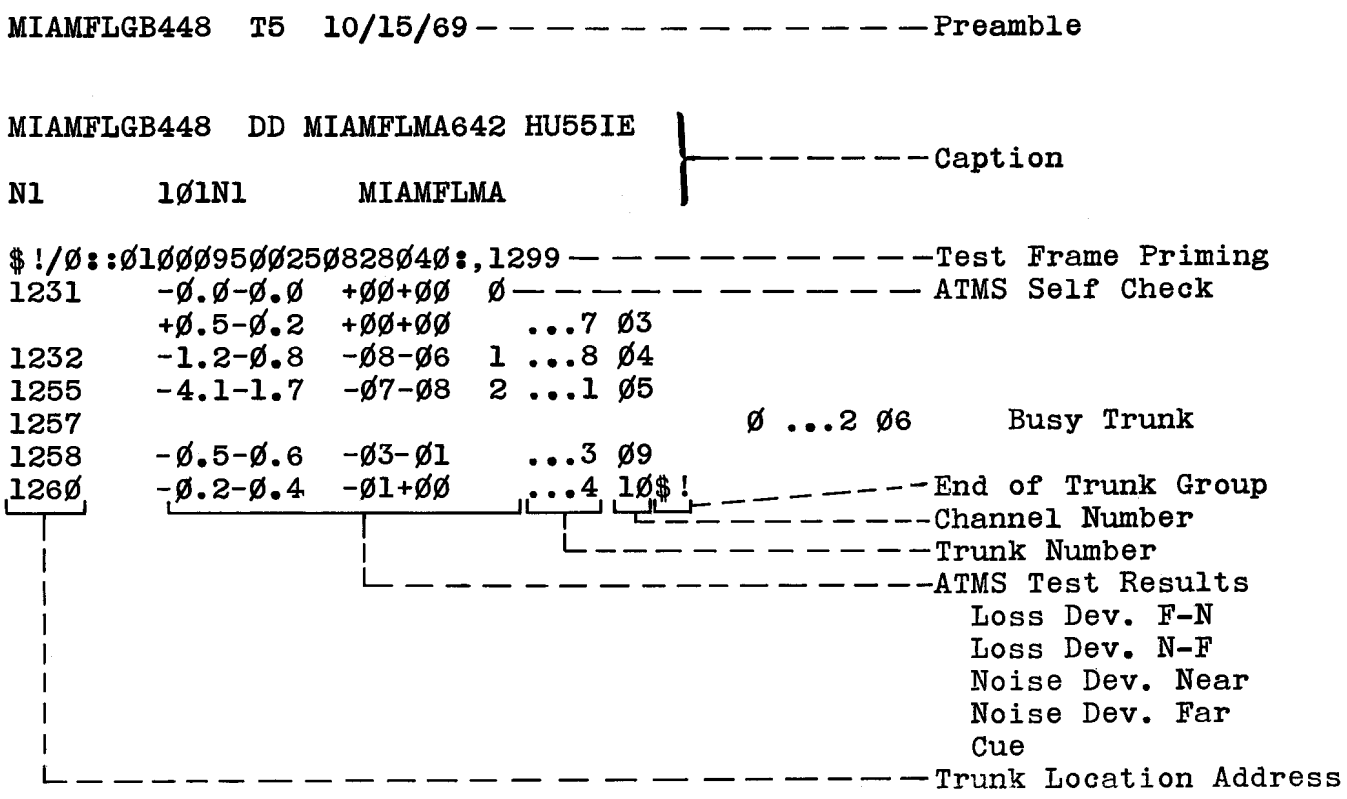


Fig. 6—Step-By-Step AOTT Frame—Sample Printout

5. NO. 4 CROSSBAR AOTT FRAME

5.01 Part 5 describes the input information required by the Automatic Outgoing Trunk Test (AOTT) frame for No. 4 crossbar switching systems. This test frame is equipped with the ATMS director and is intended for testing toll connecting trunks. The information on an input tape has been divided into three types. Each information type will be described separately. Table 15 lists the AOTT frame terminology that is commonly used to refer to the three information types.

TABLE 15

THE THREE TYPES OF INPUT INFORMATION IN A 4XB AOTT FRAME TRUNK TEST RECORD

INPUT INFORMATION TYPES	AOTT TERMINOLOGY
1. Identifying Information	— Caption Information
2. Transmission Testing Parameters	— Transmission Priming
3. Trunk Access Instructions	— Trunk Priming

Each trunk test record is composed of these types of information in one of the following combinations:

(a) Caption and Transmission Priming and Trunk Priming

(b) Caption and Trunk Priming (when transmission priming is the same as for the preceding trunk record)

(c) Trunk Priming (when caption and transmission priming are the same as for the preceding trunk record).

5.02 The AOTT frame works with 8-level paper tape. The frame uses a Model 35BS teletypewriter with a modified keyboard for input and output. The frame will automatically progress through all of the trunk test records on an input tape. Test procedure instructions are given to the test frame via key settings on the control panel. Transmission and trunk priming are entered using only standard ("Lower Case") and control characters. The shift key is used to enter "Upper Case" characters only in captions. The AOTT frame is shown in SD-68580-01. Input data requirements are given in Section 212-512-301.

5.03 The AOTT frame can be wired and arranged to automatically test up to 20,000 toll connecting trunks that can be accessed in an outgoing mode by a 4A or 4M switching system. The AOTT frame uses a test connector to identify to the marker the trunk to be tested. The sleeve (MS) and select magnet (SM) leads of outgoing toll connecting trunks are wired to the test connector. Before attempting a test, the AOTT frame checks the MS lead to see if the trunk to be tested is busy. If the trunk is idle, then the AOTT frame makes the trunk busy and bids for a marker. By using the SM lead, the AOTT frame directs the marker to the desired trunk. Thus, although the transmission path tested is through the switching machine, only a test connector number is needed to gain access to the trunk.

A. Identifying Information

5.04 Identifying information is used to put a preamble at the beginning of an input tape and to put a standard caption before each group of trunks with common information in the test sequence. The format and usage of preambles and captions are discussed in Part 2 and are illustrated for the AOTT in Fig. 7.

5.05 Identifying information is essentially unrestricted for the AOTT frame. The only constraint is that no more than 80 characters can be printed per line. CARRIAGE RETURN and LINE FEED punches should precede and follow each caption in order to position the caption as desired on the teletypewriter page.

B. Test Procedure Instructions

5.06 The AOTT frame for No. 4 crossbar switching systems requires no test procedure instructions on the input tape. The type of test (transmission or operational) to be made is under key control. Cross-connections at the test connector determine other test information, including the type of signaling to be used on the trunk and the far end test line directory number. The entries on the input tape are the same for operational and transmission testing. On an operational test run the transmission testing parameters are ignored.

C. Transmission Testing Parameters

5.07 The numbers in this data field are read into the AOTT frame and stored. If a transmission test is to be made, this priming information will be passed to the ATMS director. When preparing a tape, transmission priming is punched for only the first trunk record in a sequence of trunks with the same transmission priming. All toll connecting trunks are tested at the same level point. The test pad loss information is wired permanently into the test frame. The entries to be made for transmission priming information are listed in Table 16 and amplified below as appropriate.

5.08 The DC0 punch (control P) instructs the frame to clear previously stored transmission priming information from the relay registers. Two RUB OUT punches must follow the DC0 punch to give relay logic enough time to react before the next tape character is read. There will be no printout on the teletypewriter page associated with these punches. The DC0 punch also primes the frame to accept any group identification caption that may be put between the DC0 punch and the DC1 punch.

5.09 The DC1 punch (control Q) instructs the frame to store the digits which follow in the trunk group transmission priming relay registers. Two RUB OUT punches must follow the DC1 punch. There will be no printout on the teletypewriter page associated with these punches.

5.10 Since the test line number that the AOTT frame will actually outpulse is determined by cross-connections at the test frame, the FE digit on the tape (0, 2, 4, or 5) must be consistent with the type of test line reached by this number.

5.11 For transmission testing, the recommended range for the expected measured loss is from 00.0 to 11.3 dB. EML entries greater than 11.3 dB may be used, but the maximum positive deviation that can be printed will be limited in such cases because the maximum loss that the ATMS director can measure is about 15 dB. When testing to 104-type test lines, the near-to-far loss is based on a measurement by the director of the sum of the near-to-far and far-to-near losses. If this sum exceeds about 15 dB, the positive deviation of the near-to-far loss which can be printed will be limited, resulting in a printout of +?? and a (possibly erroneous) cue 2.

D. Trunk Access Instructions

5.12 This input information is called trunk priming in AOTT frame terminology. The trunk priming specifies the trunk location address of the trunk to be tested and other information that is unique to each trunk. The entries to be made for trunk priming are listed in Table 17 and amplified below as appropriate.

5.13 The DC2 punch (control R) instructs the frame that the test connector number follows on the input tape after four teletypewriter control punches. The four punches are RUB OUT, RUB OUT, CARRIAGE RETURN, and LINE FEED.

5.14 The trunk location address entries on the tape provide the actual trunk access information. The first entry must be either an A if the desired trunk must be accessed via the IT train, or a B if the trunk must be accessed via the TC train. The last five entries must be the test connector number of the desired trunk. (Assume AOTT is arranged for 20,000 trunk access.)

Note: For AOTTs not arranged for 20,000 trunk access, only four column entries (2nd through 5th columns) should be made after the first column. The last (6th) column should be completely disregarded making no entry in it whatsoever.

Examples:

20,000 Trunk Access	A	1	4	7	2	9
10,000 Trunk Access	A	7	2	5	6	

5.15 The traffic trunk number and the carrier channel number are not used by the AOTT but are simply reproduced on the teletypewriter for identification.

5.16 The DC7 punch (control W) indicates to the frame that the test is completed for the trunk under test. Two RUB OUT punches must follow the DC7 punch. There will be no printout on the teletypewriter page associated with these punches.

E. End-of-Tape Control

5.17 An EOT punch (control D) followed by two RUB OUT punches must be put at the end of each input tape. The EOT punch will shut off the teletypewriter and cause the AOTT frame to block and alarm. The RN key on the frame control panel must be actuated to restore the frame to normal.

F. Data Formats on the Tapes and Printout

5.18 The input information is put on the input tape in the order shown in Tables 16 and 17. To make the data format more readable, it is recommended that spaces be added per the worksheet in Fig. 22, Part 10. Figure 7 illustrates the printout that results.

TABLE 16

AUTOMATIC OUTGOING TRUNK TEST FRAME TRANSMISSION PRIMING

ENTRY DESIGNATION	ENTRY DESCRIPTION		CHAR. PRINTED ON TAPE
DCO	Clears Registers Control Character		0 (control P)
RUB OUT RUB OUT			← (RUB OUT) ← (RUB OUT)
	Group Identification Caption — Any length		
DC1	Read Transmission Priming Control Characteristics		1 (control Q)
RUB OUT RUB OUT			← (RUB OUT) ← (RUB OUT)
FE	Far End Test Line	100-type (Milliwatt-Balance)	0
		102-type (Milliwatt Supply)	2
		104-type (Transmission and Noise Check)	4
		105-type (ATMS Responder)	5
DR	Do Not Score Loss and Noise Deviation Registers		0
	Score Loss and Noise Deviation Registers		1
EML	Expected Measured Loss (Three Digits read as XX.X). The recommended range of entries is 00.0 — 11.3 dB in 0.1 dB steps		00.0 through 11.3
LOSS DEV.	Loss Deviation Limit. (Two Digits read as X.X). (See Section 660-402-300.* One of the Following Values Must Be Used: 0.4, 0.6, 0.8, 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, and 3.5 dB		0.4 through 3.5
NOISE M. L.	Noise Maintenance Limit — May Be Any Whole Number in Range From 20-48 dBrnc. See Section 660-403-500.**		20 through 48
NDL	Noise Deviation Limit — Use Zero		0
NOISE I.A.L.	Noise Immediate Action Limit. See Section 660-403-500.** One of the Following Values Must Be Used: 30, 32, 34, 36, 38, 40, 42, 44, 46, or 48 dBbrnc.		30 through 48

* Section 660-402-300 gives less deviation limit guides. Actual limits used are the option of the using office.

** If these limits are carried on the circuit layout card, the values on the card should be used.

TABLE 17

AUTOMATIC OUTGOING TRUNK TEST FRAME
TRUNK PRIMING

ENTRY DESIGNATION	ENTRY DESCRIPTION		CHAR. PRINTED ON TAPE
DC2	Read Trunk Access Priming Control Char.		2 (control R)
RUB OUT RUB OUT			← (RUB OUT) ← (RUB OUT)
CRT LNF	Teletypewriter Control		— (CARR. RET.) * (LINE FEED)
TEST CONNECTOR	Trunk Location Address	IT Train or TC Train	A or B
		Test Connector Number — Four Digits — Five Digits	 0000—9999 00000—19999
			(space)
TRUNK NUMBER	Traffic Assigned Trunk Number-4 Digits. If Assigned Trunk Number is Less Than 4 Digits, Use Periods in Leading Positions. eg, . . 45		0000 — 9999
			(space)
CHAN. NO.	Channel Number (Used When Caption Specified a Carrier System)		00 — 99
DC7	End of Trunk Record Control Character		7 (control W)
RUB OUT RUB OUT			← (RUB OUT) ← (RUB OUT)
At the end of the tape:			
EOT	End of Tape Control Character		$ (control D)
RUB OUT RUB OUT			← (RUB OUT) ← (RUB OUT)

TABLE 18

NO. 4 CROSSBAR OFFICES – TOLL CONNECTING TRUNKS
RELATION BETWEEN TRUNK APPEARANCE AND TEST CONNECTOR ASSIGNMENT

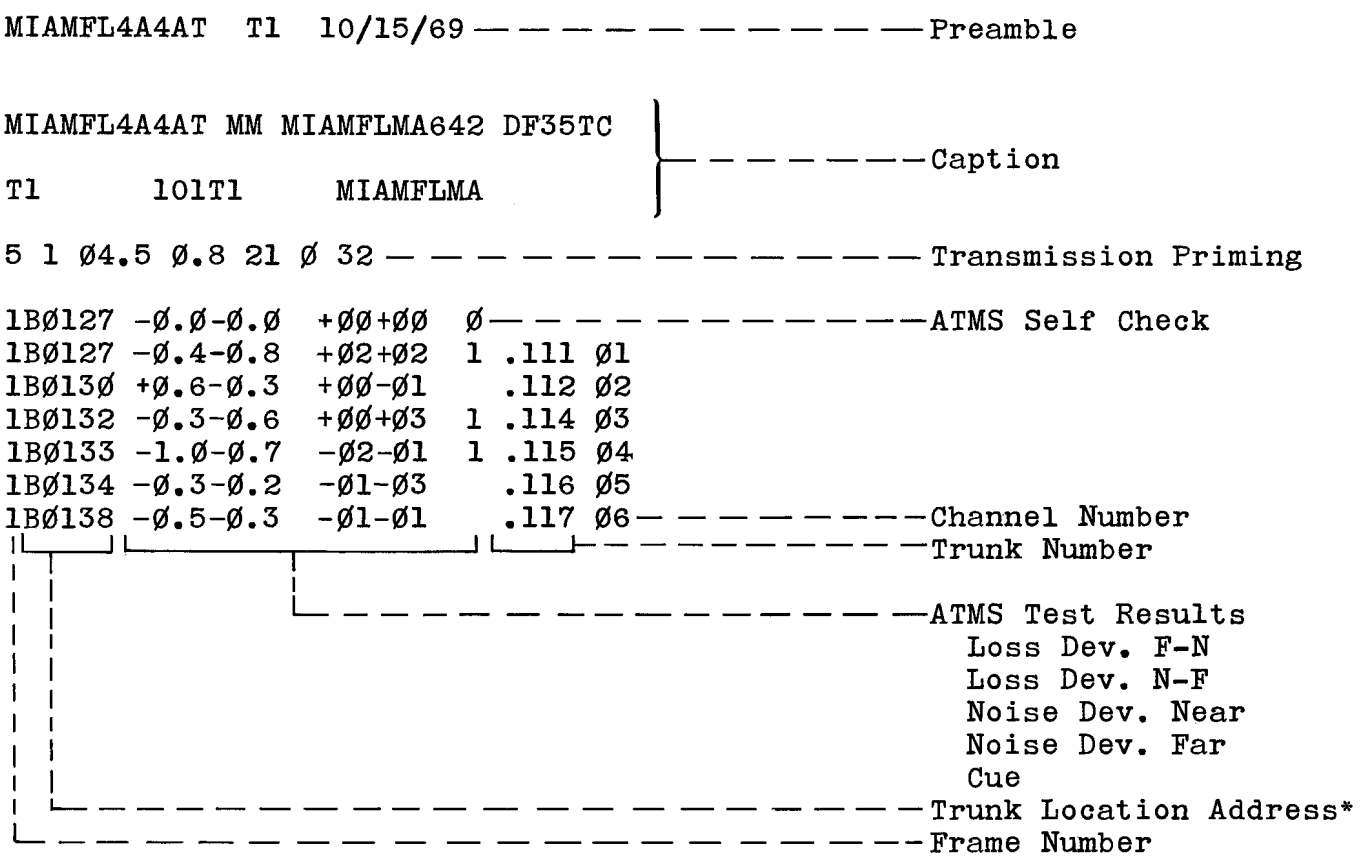
ASSIGNED TRUNK APPEARANCE			
TRAIN	TRUNK BLOCK CONNECTOR	RELAY OR TRUNK BLOCK	TBC TERMINAL NUMBER
IT or TC	X or XX	X	XX

Translates to[1]

TEST CONNECTOR ASSIGNMENT				
TRAIN	EXTRA DIGIT[2]	CONNECTOR SWITCH OR GROUP	SWITCH HORIZONTAL	SWITCH VERTICAL
A or B	0 or 1	XX	X	X

Note 1 — This relationship is fixed for any given office but will vary between offices. Tape Administration Centers will require a record of this translation. A form designed for compiling this record is shown in Fig. 32, Part 10.

Note 2 — This extra digit is used to identify in which of two blocks of up to 10,000 trunks the desired trunk is located. For AOTTs arranged only for 10,000 trunks, disregard this extra digit entry. (See 5.14.)



*Example of AOTT with 10,000 trunk access only. (See 5.14)

Fig. 7—No. 4 Crossbar AOTT Frame—Sample Printout

6. NO. 4 CROSSBAR ADOIT TEST FRAME

6.01 Part 6 describes the input information required by the Automatically Directed Outgoing Intertoll Trunk (ADOIT) test frame. This test frame is equipped with the ATMS director and is controlled by 80-column punched cards. The ADOIT produces a printout of test results and punches an output card deck, if desired, to be used for retesting selected trunks or for processing results.

6.02 Five different card formats are used to enter control information. For descriptive purposes, the information on the cards in an input deck has been divided into four types. Each type will be described separately. Table 19 lists the five types of ADOIT test frame input cards and the input information types on each.

6.03 The ADOIT is arranged to automatically test all intertoll trunks to which outgoing access is available in a 4A or 4M switching office. The ADOIT uses a test connector to select the trunk to be tested. The sleeve (MS) and select magnet (SM) leads of outgoing intertoll trunks are wired to the test connector switches. Before attempting a test, the test frame checks the MS lead to see if the trunk to be tested is busy. If the trunk is idle, the test frame makes it busy and bids for a marker. Then, by means of the SM lead, the test frame directs the marker to the desired trunk. When the trunk is connected to the test frame, the switching machine common control equipment and the test connector are released for use by competing equipment. The test connector switches can be connected to a maximum of 20,000 trunks. Up to four test frames can have access to the test connector.

6.04 The earlier ADOIT frames use a modified IBM 870 Document Writing System for input and output. In the later frames, the IBM 834 control unit/card reader of the 870 System is replaced by a Card Reading and Recording circuit per SD-68592-01 and an NCR EM-D2 card reader. The ADOIT test frame is shown in SD-68588-01. Input data requirements are given in Section 212-514-301. There is no difference in the input data requirements for the two arrangements, except that the IBM card deck is read from front to back and the NCR card deck from back to front.

A. Identifying Information—Preambles and Captions

6.05 Identifying information is used to put a preamble at the beginning of a deck of cards and to put a standard caption before each group of trunks with common information in the test sequence. The format and usage of preambles and captions are discussed in Part 2 and are illustrated in Fig. 9. A worksheet ruler for use in compiling data for preambles and captions is pictured in Fig. 23, Part 10.

6.06 Identifying information is placed in Columns 2 through 79 of W-type cards. Any characters in the 870 System character set may be used. To identify the card as one containing identifying information, a "W" is punched in Column 1. These cards will be reproduced as part of the output card deck. In order to facilitate assembly of a retest deck for trunks that test busy on the initial test, a zero should be punched in Column 80 of each W-type card. A sort of the output deck on this column will then separate out a retest deck containing identifying information.

B. Identifying Information—Per Trunk Information

6.07 Columns 20 through 80 of an input trunk (Y-type) card carry identifying information. This consists of the test interval, trunk identification, facility identification, test number, and date of preparation.

6.08 Output trunk (Y-type) cards punched by the ADOIT carry transmission test results in Columns 20 through 36 and identifying information in Columns 37 through 80. Columns 37 through 70 of the output card are copied directly from the input card. Column 71 gives the test number. On the input card a zero is always punched in this column. The first output card obtained contains a 1 in this column. If that output card were used to make a second test, a 2 would be punched on the second output card,

and so on. Columns 72 through 79 on the output card contain the date and time when the test results were obtained. Column 80 is a busy sort cue. Trunks that are busy when tested have a zero punched in this column for use in sorting out these trunks for retesting.

C. Test Procedure Instructions

6.09 Only very minimal test procedure instructions are given to the ADOIT test frame via the input cards. The type of test to be made is under key control. The same deck of cards can be used to make either operational or transmission tests. On an operational test run, the transmission testing parameters are ignored.

6.10 The ADOIT test frame recognizes three test procedure instructions indicated by a T, X, or Z punch in Column 1 of an input card. The use of these cards is described in Table 19.

D. Transmission Testing Parameters

6.11 Columns 8 through 19 of the trunk (Y-type) cards contain the transmission priming required to test the trunk. Table 20 describes the transmission priming entries for the ADOIT. Unlike some other types of test frames, the ADOIT does not require test pad loss information as part of the transmission priming. The ATMS director is permanently wired with the test pad loss information since intertoll trunks are always tested with a 2-dB test pad (TP2).

6.12 For transmission testing, the recommended range for the expected measured loss (Columns 10, 11, and 12) is from 00.0 to 11.3 dB. EML entries greater than 11.3 dB may be used, but the maximum positive deviation that can be printed will be limited in such cases because the maximum loss that the ATMS director can measure is about 15 dB. When testing to 104-type test lines, the near-to-far loss is based on a measurement by the director of the sum of the near-to-far and far-to-near losses. If this sum exceeds about 15 dB, the positive deviation of the near-to-far loss which can be printed will be limited, resulting in a printout of +?? and a (possibly erroneous) cue 2.

E. Trunk Access Instructions

6.13 The numbers in Columns 2 through 7 on a Y-type card provide the trunk access data as shown in Table 20. This consists of the test connector number of the trunk to be tested.

F. Data Format of Cards and Printout

6.14 Sample ADOIT test frame printouts are illustrated in Fig. 8 and 9. Card preparation worksheets designed to produce these printouts are shown in Fig. 24, Part 10. Standard input and output cards for the ADOIT are illustrated in Fig. 10 and 11. The data keys printed on the cards are for trunk (Y-type) data, but the cards are intended to be used for T-, W-, X-, and Z-type cards as well. This facilitates computer preparation of card decks by providing only one card stock for all types of cards and eliminates the need for manual deck set-up.

6.15 The input card has two print fields. The standard print field along the top edge of the card will be used by printing card punches, commonly called keypunch machines. The second print field on the card is designed to accept the printing of the two card interpreting machines in common use: the IBM 557 and the IBM 2560. The two card interpreting machines have different type widths, and both machines require a 2-line print field to fit 80 characters on a card.

6.16 The IBM 557 Alphabetic Interpreter prints one line of up to 60 characters per card at a speed of 100 cards per minute. Table 22 provides the information necessary to set up the 557 program board for interpreting the standard input card.

6.17 The IBM 2560 Multifunction Card Machine is designed for use with the IBM System 360 Model 20 or Model 25 Central Processing Unit. Under computer control, the 2560 can read, punch, print, or print and punch cards. The 2560 Model A1 can print and punch the input cards at a speed of 91 cards per minute. The 2560 Model A2 can do the same job at 65 cards per minute. Table 22 provides the information necessary to write a program for interpreting the input card. Note that trunk (Y-type) data is interpreted differently than other data types (T-, W-, X-, or Z-type).

6.18 The IBM 26 Model 21 and IBM 029 Model C22 keypunch machines can also be used to interpret punched cards. These machines have an additional read station just before the print and punch station. The machines have all the features of common printing card punch models plus the interpret feature. Both machines will interpret cards at a rate of approximately 12 cards per minute. The printing will be in the standard print field along the top edge of the card.

TABLE 19

TYPES OF INPUT INFORMATION ON ADOIT TEST FRAME INPUT CARDS

INPUT CARD TYPE	INFORMATION TYPE	USE
T — Time Card	Test Procedure Instructions	Causes the date and time to be printed by the typewriter.
W — Caption Card	Identifying Information	Carries a preamble or group caption to be put out on the typewriter and card punch.
Y — Trunk Card	Trunk Access Instructions, Transmission Testing Parameters, Identifying Information	Provides the priming information and identification for a trunk.
X — Control Card	Test Procedure Instructions	Instructs the test frame to operate in the group test mode.[1]
Z — Control Card	Test Procedure Instructions	Cancels the group test mode and instructs the frame to operate in the single trunk test mode.[2]

NOTES:

1. The group test mode is used when a group of Y-type cards have identical transmission priming. In this mode, the ATMS self-check is made only once and the results of the self-check and the priming information are printed only once for the group.
2. In the single trunk test mode, the ATMS self-check is made before measuring each trunk. The results of the self-check and the transmission priming information are printed for each trunk.

TABLE 20

AUTOMATICALLY DIRECTED OUTGOING INTERTOLL TRUNK TEST FRAME TRUNK (Y-TYPE) CARD PRIMING INFORMATION

CARD COLUMN	ENTRY DESCRIPTION		PRIMING ENTRIES
1	Card Type		Y
2	Train Location of Trunk	IT Train or	A
		TC Train	B
3-7	Test Connector Number		00000 through 19999
8	Far End Test Line	104-Type (Transmission and Noise Check)	4
		105-Type (ATMS Responder)	5
9	Do Not Score Loss and Noise Deviation Registers		0
	Score Loss and Noise Deviation Registers		1
10-12	Expected Measured Loss (Three Digits read as XX.X). The recommended range of Entries is 00.0 — 11.3 dB in 0.1-dB steps		000 through 113
13, 14	Loss Deviation Limit. (Two Digits read as X.X). See Section 660-402-300.* One of the Following Values Must be Used: 0.4, 0.6, 0.8, 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, or 3.5 dB		04 through 35
15, 16	Noise Maintenance Limit — May Be any Whole Number in Range From 20-48 dBrnc. See Section 660-403-500.**		20 through 48
17	Noise Deviation Limit — Use Zero		0
18, 19	Noise Immediate Action Limit. See Section 660-403-500.** One of the Following Values Must Be Used: 30, 32, 34, 36, 38, 40, 42, 44, 46, or 48 dBrnc		30 through 48
20			Blank
21	Test Interval Identification	Daily	0
		Weekly	1
		Semimonthly	2
		Monthly	3

* Section 660-402-300 gives loss deviation limit guides. Actual limits used are the option of the using office.

** If these limits are carried on the circuit layout card, the values on the card should be used.

TABLE 21

NO. 4 CROSSBAR OFFICES — INTERTOLL TRUNKS
RELATION BETWEEN TRUNK APPEARANCE AND TEST CONNECTOR ASSIGNMENT

ASSIGNED TRUNK APPEARANCE			
TRAIN	TRUNK BLOCK CONNECTOR	RELAY OR TRUNK BLOCK	TBC TERMINAL NUMBER
IT or TC	X or XX	X	XX

Translates to[1]

TEST CONNECTOR ASSIGNMENT				
TRAIN	EXTRA DIGIT[2]	CONNECTOR SWITCH OR GROUP	SWITCH HORIZONTAL	SWITCH VERTICAL
A or B	0 or 1	XX	X	X

NOTES:

1. This relationship is fixed for any given office, but will vary between offices. Tape Administration Centers will require a record of this translation. A form designed for compiling this record is shown in Fig. 32, Part 10.
2. This extra digit is used to identify in which of two blocks of up to 10,000 trunks the desired trunk is located.

TABLE 22

CARD INTERPRETER SET-UP INFORMATION

CARD COLUMN	IBM 557 ALPHABETIC INTERPRETER ENTRY AND PRINT POSITION	IBM 2560 MULTI-FUNCTION CARD MACHINE	
		FOR CARDS WITH "Y" IN COLUMN 1: HEAD, PRINT POS.	FOR CARDS WITH OTHER DATA: HEAD, PRINT POS.
1	1,2	1,1	1,1
2	1,3	1,3	1,3
3	1,4	1,4	1,4
4	1,5	1,5	1,5
5	1,6	1,6	1,6
6	1,7	1,7	1,7
7	1,8	1,8	1,8
8	1,9	1,9	1,9
9	1,10	1,10	1,10
10	1,11	1,11	1,11
11	1,12	1,12	1,12
12	1,13	1,13	1,13
13	1,14	1,14	1,14
14	1,15	1,15	1,15
15	1,16	1,16	1,16
16	1,17	1,17	1,17
17	1,18	1,18	1,18
18	1,19	1,19	1,19
19	1,20	1,20	1,20
20	1,21	1,23	1,21

TABLE 22 (Cont)

CARD INTERPRETER SET-UP INFORMATION

CARD COLUMN	IBM 557 ALPHABETIC INTERPRETER ENTRY AND PRINT POSITION	IBM 2560 MULTI-FUNCTION CARD MACHINE	
		FOR CARDS WITH "Y" IN COLUMN 1: HEAD, PRINT POS.	FOR CARDS WITH OTHER DATA: HEAD, PRINT POS.
21	1,22	1,24	1,22
22	1,23	1,26	1,23
23	1,24	1,27	1,24
24	1,25	1,28	1,25
25	1,26	1,29	1,26
26	1,27	1,30	1,27
27	1,28	1,31	1,28
28	1,29	1,32	1,29
29	1,30	1,33	1,30
30	1,31	1,34	1,31
31	1,32	1,35	1,32
32	1,33	1,36	1,33
33	1,34	1,38	1,34
34	1,35	1,39	1,35
35	1,36	1,40	1,36
36	1,37	1,41	1,37
37	1,38	1,43	1,38
38	1,39	1,44	1,39
39	1,40	1,45	1,40
40	1,41	1,46	1,41

TABLE 22 (Cont)

CARD INTERPRETER SET-UP INFORMATION

CARD COLUMN	IBM 557 ALPHABETIC INTERPRETER ENTRY AND PRINT POSITION	IBM 2560 MULTI-FUNCTION CARD MACHINE FOR CARDS WITH "Y" IN COLUMN 1: HEAD, PRINT POS.	IBM 2560 MULTI-FUNCTION CARD MACHINE FOR CARDS WITH OTHER DATA: HEAD, PRINT POS.
41	1,42	1,48	1,42
42	1,43	1,49	1,43
43	1,44	1,50	1,44
44	1,45	1,51	1,45
45	1,46	1,52	1,46
46	1,47	1,53	1,47
47	1,48	1,54	1,48
48	1,49	1,55	1,49
49	1,50	1,56	1,50
50	1,51	1,57	1,51
51	1,52	1,58	1,52
52	2,28	2,32	2,35
53	2,29	2,33	2,36
54	2,30	2,34	2,37
55	2,31	2,35	2,38
56	2,32	2,36	2,39
57	2,33	2,37	2,40
58	2,34	2,38	2,41
59	2,35	2,39	2,42
60	2,36	2,40	2,43

TABLE 22 (Cont)

CARD INTERPRETER SET-UP INFORMATION

CARD COLUMN	IBM 557 ALPHABETIC INTERPRETER ENTRY AND PRINT POSITION	IBM 2560 MULTI-FUNCTION CARD MACHINE FOR CARDS WITH "Y" IN COLUMN 1: HEAD, PRINT POS.	IBM 2560 MULTI-FUNCTION CARD MACHINE FOR CARDS WITH OTHER DATA: HEAD, PRINT POS.
61	2,37	2,41	2,44
62	2,38	2,42	2,45
63	2,39	2,44	2,46
64	2,40	2,45	2,47
65	2,41	2,47	2,48
66	2,42	2,48	2,49
67	2,43	2,49	2,50
68	2,44	2,50	2,51
69	2,45	2,51	2,52
70	2,46	2,52	2,53
71	2,47	2,54	2,54
72	2,48	2,55	2,55
73	2,49	2,56	2,56
74	2,50	2,57	2,57
75	2,51	2,58	2,58
76	2,52	2,59	2,59
77	2,53	2,60	2,60
78	2,54	2,61	2,61
79	2,55	2,62	2,62
80	2,56	2,64	2,64

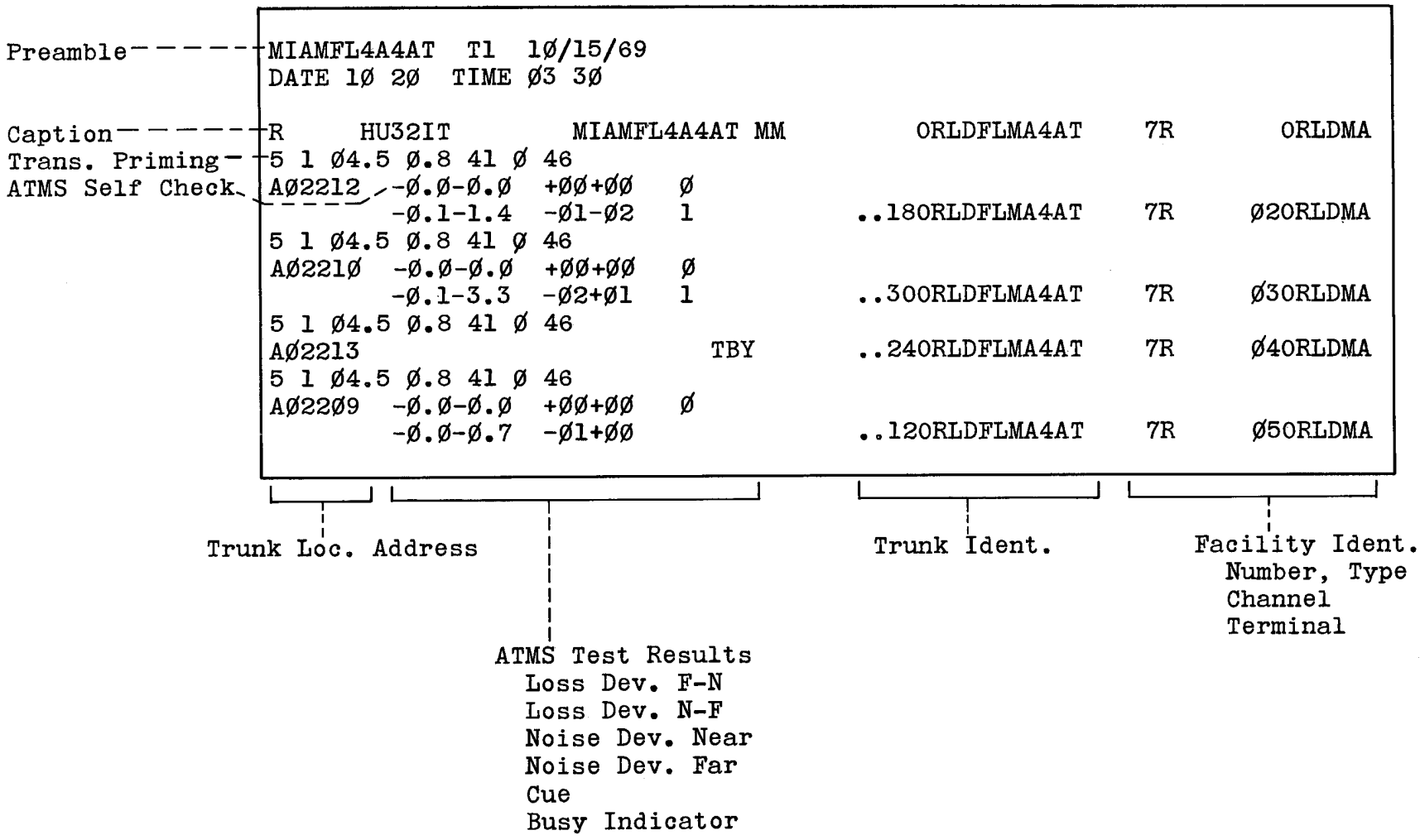


Fig. 8—No. 4 Crossbar ADOIT Test Frame—Sample Printout Single Trunk Test Mode (X- and Z-type Control Cards Not Used)

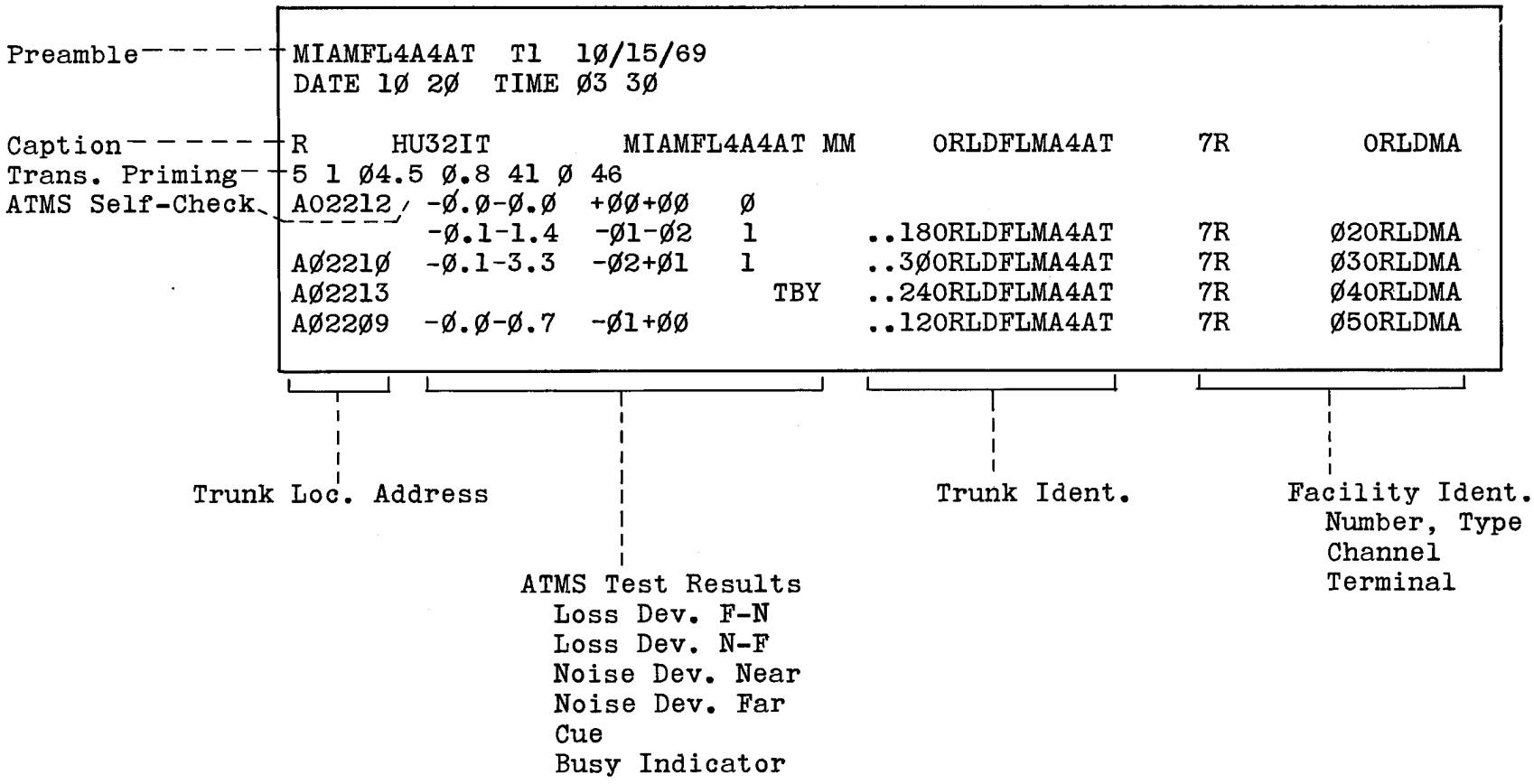


Fig. 9—No. 4 Crossbar ADOIT Test Frame—Sample Printout Group Test Mode (Using X- and Z-type Control Cards)

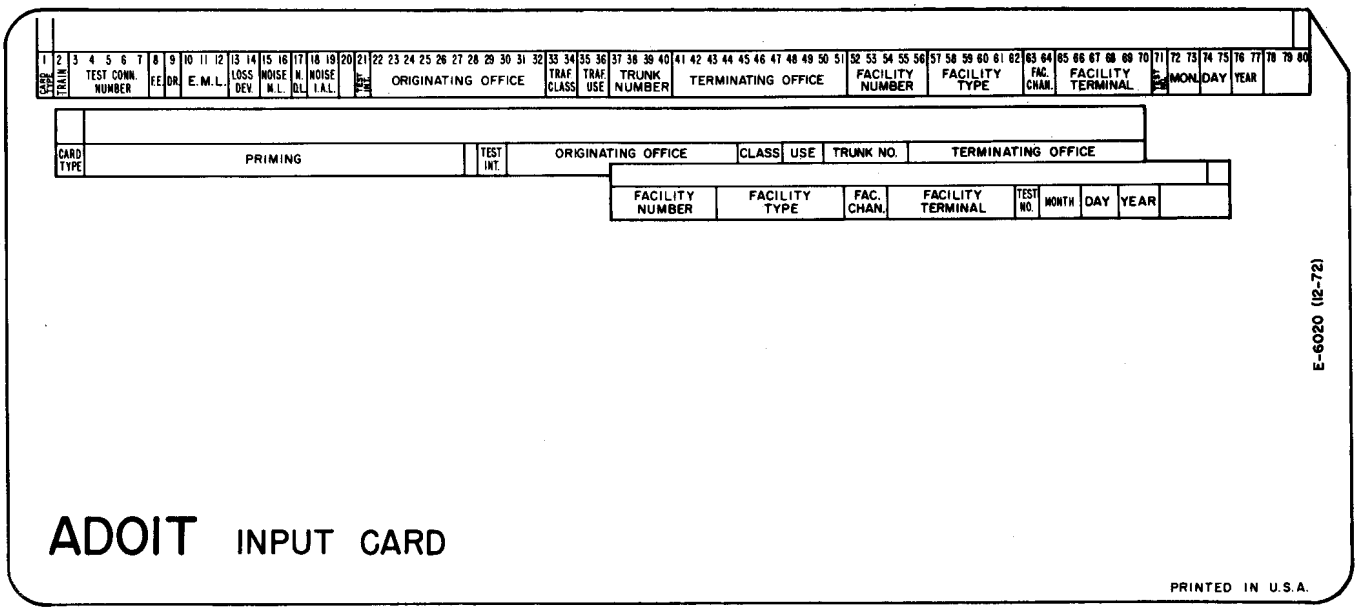


Fig. 10—ADOIT Input Card—Yellow

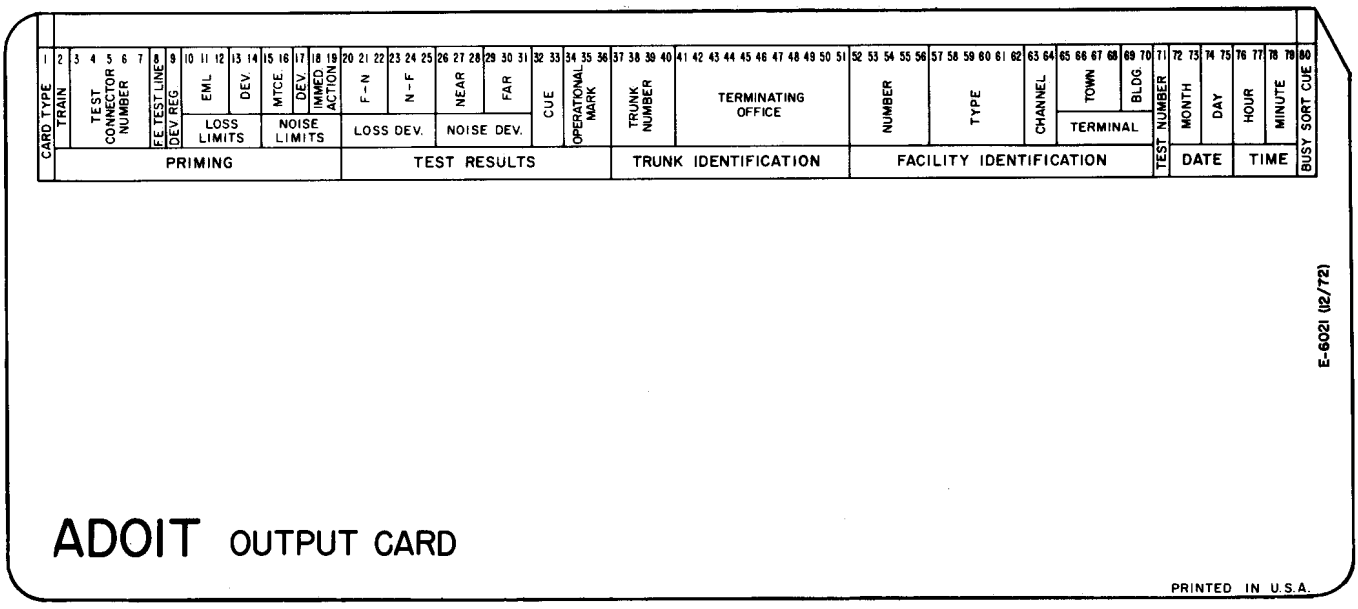


Fig. 11—ADOIT Output Card—Natural

7. NO. 5 CROSSBAR ROTL

7.01 The No. 5 Crossbar Remote Office Test Line (ROTL) can be controlled from either an APTT test frame or a Step-by-Step AOTT Test Frame. The ROTL itself has no input medium such as paper tape or punched cards. The testing sequence for tests via ROTL is controlled by the input paper tape at the controlling test frame. For testing via ROTL, the test frame must be supplied with the ROTL directory number and five ROTL priming digits. The ROTL priming digits are used in conjunction with additional information that is wired into the ROTL (see Table 23) to force the common control switching equipment to access a particular trunk in a trunk group. The ROTL priming information is used to select one of up to 20 prewired sets of this additional information. The testing capacity of the No. 5 Crossbar ROTL is presently limited to a maximum of 20 trunk groups. The ROTL is shown in SD-27698-01 and SD-27727-01.

TABLE 23

NO. 5 CROSSBAR ROTL — PRE-WIRED INFORMATION

1. NNX code by which the trunk will be reached.
2. Far-end test line number.
3. A class of service which has access to the desired trunk group.
4. The type of translation which has access to the desired trunk group.
5. Type of far-end test line to which the test will be made.

7.02 No identifying information is given to the ROTL. Preamble and caption information is carried on the input tape of the controlling test frame and is copied onto the test frame printout with the test results as discussed in Parts 3 and 4.

7.03 No transmission testing parameters are given to the ROTL. The transmission testing parameters are passed by the controlling test frame from the input tape to the ATMS director in the test frame. The director controls the transmission test and evaluates the results before they are printed on the test frame teletypewriter.

7.04 The input information required by the No. 5 Crossbar ROTL consists of five digits as shown in Fig. 12. Tables 7 and 13 in Parts 3 and 4, respectively, indicate where these digits should be entered on the test frame input tape.

7.05 The first digit of the ROTL priming informs the ROTL of the type of test to be made. The ROTL uses this information to determine which type of far-end test line number to outpulse and what functions to perform during the test. The test frame priming must coincide so that the results will be interpreted correctly.

7.06 The second, third, fourth, and fifth priming digits give the ROTL the information it requires to gain access to a particular trunk. The information required consists of the trunk link frame, trunk test lead, and route translation. Each of these three items has a value in the range 00 through 19, so that six digits are involved. These six digits are coded into four digits to transmit the information to the ROTL. The units digits are transmitted as digits B, D, and E as shown in Fig. 12. The three tens digits can have any one of eight combinations and are coded into the C digit as shown in Table 24.

TABLE 24

PRIMING FOR THE C DIGIT

IF THE THREE TENS DIGITS ARE:			THE C DIGIT IS:
TRUNK LINK FRAME	TRUNK TEST LEAD	ROUTE TRANS.	
0	0	0	0
1	0	0	1
0	1	0	2
1	1	0	3
0	0	1	4
1	0	1	5
0	1	1	6
1	1	1	7

ROTL PRIMING DIGITS				
A	B	C	D	E
1,2	0-9	0-7	0-9	0-9

A Digit = Type of test

Transmission Test: A = 1
Operational Test: A = 2

B Digit = Units Digits of Trunk Link Frame of Desired Trunk

C Digit: See Table 24.

D Digit = Units Digit of Trunk Test Lead of Desired Trunk

E Digit = Units Digit of Route Translation for Desired Trunk

Fig. 12—No. 5 Crossbar ROTL Priming Digits

8. STEP-BY-STEP ROTL

8.01 The Step-by-Step Remote Office Test Line (ROTL) can be controlled from either an APTT test frame or a Step-by-Step AOTT test frame. The ROTL itself has no input medium such as paper tape or punched cards. The testing sequence for tests via ROTL is controlled by the input tape at the controlling test frame. The ROTL can provide access to up to 1000 trunks via its associated test connector. The Step-by-Step ROTL is shown on SD-32521-01.

8.02 Identifying information is provided for use at the controlling test frame. It is not used by the ROTL. Preamble and caption information is placed on the input tape of the controlling test frame and is copied onto the test frame printout with the test results as discussed in Parts 3 and 4.

8.03 Transmission testing parameters are passed from the input tape to the controlling test frame. The test frame uses them in controlling the ROTL and evaluating the ROTL test results before they are printed on the test frame teletypewriter. A detailed description of the required transmission priming data is given in Part 3 for the No. 5 Crossbar APTT and Part 4 for the Step-by-Step AOTT frame.

8.04 The input information used directly by the Step-by-Step ROTL consists of five digits as shown in Fig. 13. Tables 7 and 13 in Parts 3 and 4, respectively, indicate where these digits should be entered on the test frame input tape. Far-end test line numbers are wired into the ROTL and thus do not need to be supplied as part of the ROTL priming.

8.05 The first digit of the ROTL priming informs the ROTL of the type of test to be made. The ROTL uses this information to determine which type of far-end test line number to outpulse and what functions to perform during the test. The test frame priming must be consistent with this digit so that the results will be interpreted correctly. The second, third, and fourth digits supply the test connector number of the trunk to be tested. The fifth digit is a filler and is not used by the Step-by-Step ROTL.

ROTL PRIMING DIGITS				
A	B	C	D	E
1 or 2	0-9	0-9	0-9	2

A Digit = Type of Test
Transmission Test : A = 1
Operational Test : A = 2

B Digit
C Digit
D Digit
} Test Connector Number of Desired Trunk.

E: Digit: Not Used by the ROTL. Enter a 2.

Fig. 13—Step-By-Step ROTL Priming

9. COMPARISON OF INPUT REQUIREMENTS

9.01 Figures 14 through 18 summarize and compare the input requirements of the four automatic test frames. These figures are included as a compact reference for those familiar with the ATMS program and its associated test equipment to use in planning and implementing centralized tape and card preparation. These figures do not contain the complete priming instructions, particularly for the APTT. Refer to Parts 3 through 6 for detailed priming instructions.

9.02 Figure 14 is an overall comparison of the types and formats of the input information for the four test frames. Figures 15 through 18 amplify various parts of this information.

9.03 Figure 15 compares the control characters and arrangements for entering identifying information (preambles and captions). The standard preambles and captions specified in Part 2 are shown at the bottom of the sheet.

9.04 Figure 16 compares the test procedure instruction requirements of the No. 5 Crossbar APTT and the Step-by-Step AOTT. The No. 4 Crossbar ADOIT and AOTT do not require test procedure instructions on the input media. Instead, this information is entered via key settings on the test frames.

9.05 Figure 17 compares the transmission testing parameter requirements. These are similar for all four frames. The main differences are that the Step-by-Step AOTT requires an extra digit specifying the measuring impedance and that the No. 4 Crossbar test frames do not require test pad loss information.

9.06 Figure 18 compares the trunk access instruction requirements and the per trunk identifying information specified for the four test frames. Since the ADOIT produces output cards that can be used individually for trouble records and retest purposes, a larger amount of per trunk identifying information is specified for this test frame than for the others.

A COMPARISON OF THE INPUT REQUIREMENTS OF THE ATMS-EQUIPPED AUTOMATIC TRUNK TEST FRAMES

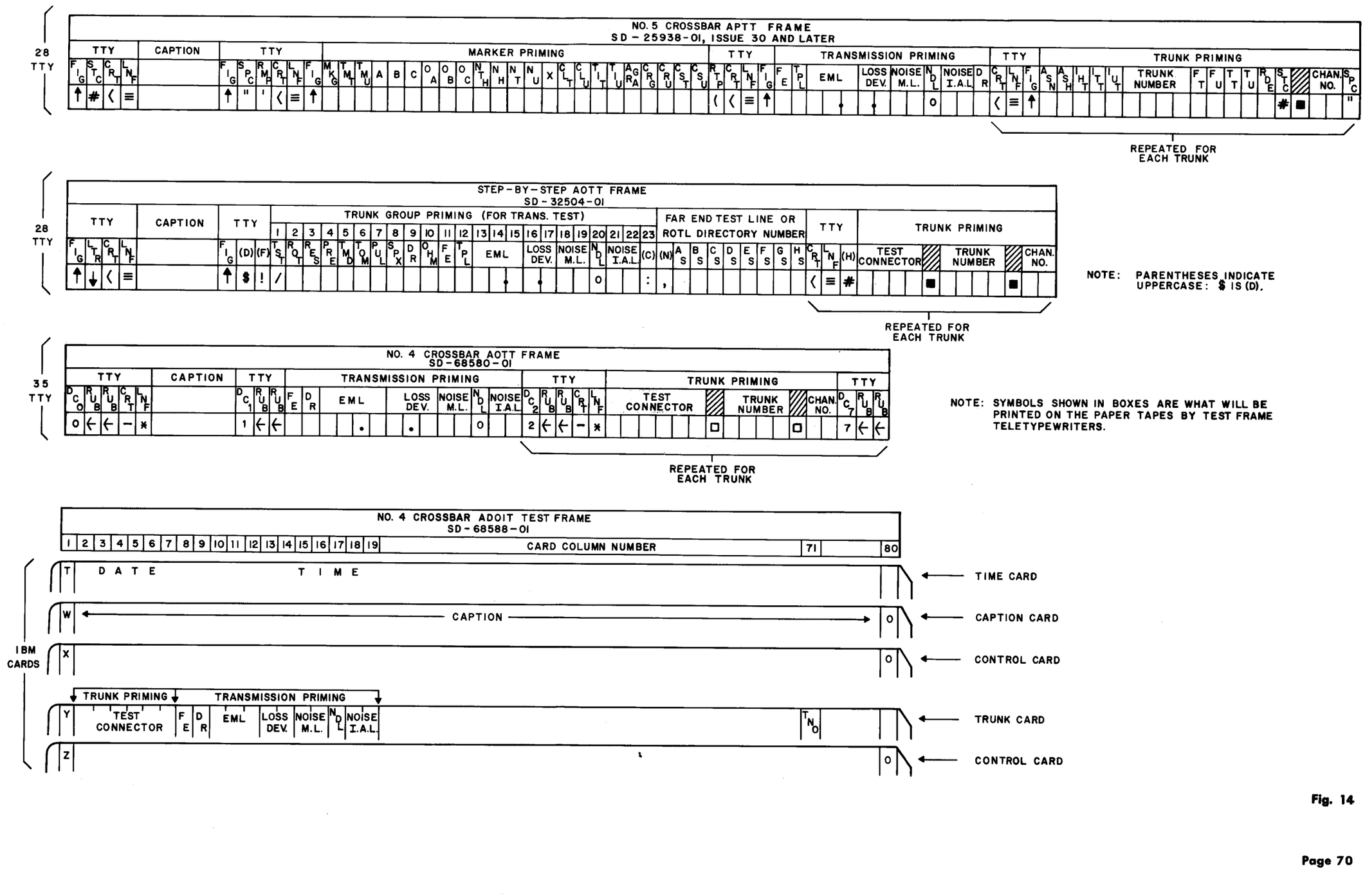


Fig. 14

A COMPARISON OF IDENTIFYING INFORMATION REQUIREMENTS

28 TTY

NO. 5 CROSSBAR APTT FRAME
SD - 25938 - 01, ISSUE 30 AND LATER

TTY				CAPTION	TTY	
FIGURES SHIFT	START COPY	CARR. RET.	LINE FEED	STANDARD PREAMBLE OR CAPTION (SEE BELOW AND NO. 5 CROSSBAR APTT FRAME TAPE PREPARATION WORKSHEET)	FIGURES SHIFT	STOP COPY
↑	#	⟨	≡		↑	//

- IGNORED BY APTT; JUST USED TO POSITION TTY PAGE PRINTER.
- INSTRUCTS APTT TO COPY FOLLOWING INFORMATION.
- UNLOCKS APTT STEERING CIRCUIT SO THAT FOLLOWING CHARACTER WILL BE READ.
- INSTRUCTS APTT TO STOP COPYING.
- NECESSARY IF NOT ALREADY IN FIGURES SHIFT.

28 TTY

STEP-BY-STEP AOTT FRAME
SD - 32504 - 01

TTY				CAPTION	TTY	
FIGURES SHIFT	LETTERS SHIFT	CARR. RET.	LINE FEED	STANDARD PREAMBLE OR CAPTION (SEE BELOW AND STEP-BY-STEP AOTT FRAME TAPE PREPARATION WORKSHEET)	FIGURES SHIFT	CONNECT TST. CIR.
↑	↓	⟨	≡		↑	$

- IGNORED BY AOTT; JUST USED TO POSITION TTY PAGE PRINTER.
- INSTRUCTS AOTT TO DISCONNECT TEST CIRCUIT FROM TTY TRANSMITTER - DISTRIBUTOR;
- IF PRECEDED BY A FIGURES SHIFT, INSTRUCTS THE AOTT TO CONNECT THE TEST CIRCUIT.
- INSTRUCTS THE AOTT TO LOOK FOR A FOLLOWING $.

35 TTY

NO. 4 CROSSBAR AOTT FRAME
SD - 68580 - 01

TTY					CAPTION	TTY		
DC 0	RUB OUT	RUB OUT	CARR. RET.	LINE FEED	STANDARD PREAMBLE OR CAPTION (SEE BELOW AND NO. 4 CROSSBAR AOTT FRAME TAPE PREPARATION WORKSHEET)	DC 1	RUB OUT	RUB OUT
0	←	←	–	*		1	←	←

- IGNORED BY AOTT; JUST USED TO POSITION TTY PAGE PRINTER.
- NEEDED TO INSURE RELAY HAS TIME TO OPERATE.
- INSTRUCTS AOTT TO CLEAR RELAY REGISTERS AND TO COPY THE FOLLOWING DATA.
- NEEDED TO INSURE RELAY HAS TIME TO OPERATE.
- INSTRUCTS AOTT TO CONTINUE COPYING BUT ALSO STORE THE TRANSMISSION PRIMING THAT FOLLOWS.

NO. 4 CROSSBAR ADOIT TEST FRAME
SD - 68588 - 01

1	2	3	...	78	79	80

IBM CARD

W	STANDARD PREAMBLE OR CAPTION (SEE NO. 4 CROSSBAR ADOIT TEST FRAME CARD PREPARATION WORKSHEET RULER)	0

- W: CARD TYPE.
- 0: BUSY SORT CUE.

PREAMBLE :

ORIGINATING OFFICE					TAPE		DATE			TTY		ADDITIONAL PREAMBLE INFORMATION	TTY	
TOWN	STATE	BLDG.	UNIT		TYPE		MONTH	DAY	YEAR	CRT	LNF	SHOULD NOT EXCEED 240 CHARACTERS (3 W CARDS FOR ADOIT TEST FRAME)	CRT	LNF
								/	/					

CAPTION :

ORIGINATING OFFICE					TERMINATING OFFICE						TRUNK TYPE				TTY		TEST GROUP		FACILITY IDENTIFICATION			FACILITY TERMINAL,			TTY	
TOWN	STATE	BLDG.	UNIT		PULSING		TOWN	STATE	BLDG.	UNIT		TRAF. CLASS	OFF. CLASS	TRAF. USE	MODIFIER	CRT	LNF	FACILITY		NUMBER	TYPE		TOWN	STATE	BLDG.	CRT	LNF

Fig. 15

A COMPARISON OF TEST PROCEDURE INSTRUCTION REQUIREMENTS

NO. 5 CROSSBAR APTT FRAME
SD-25938-01, ISSUE 30 AND LATER

28 TTY	TTY				MARKER PRIMING																						
	RELEASE MKR. PRI.	CARR. RET.	LINE FEED	FIGURES SHIFT	MKG	TMT	TMU	A	B	C	OA	OB	OC	NTH	NH	NT	NU	X	CLT	CLU	TIT	TIU	AGRA	CRG	CRU	CST	CSU
	'	⟨	≡	↑	0,1,2	00-19		0-9	0-9	0-9	0-9	0-9	0-9	0-9	0-9	0-9	0-9	0,3-7	00-34		00-29		0-9	00-19		00-99	

NOTE:
ORIGINATING TESTING MODE: CLASS OF SERVICE WHICH HAS ACCESS TO DESIRED TRUNK.
TOLL OR TANDEM TESTING MODE: DETERMINES WHICH TRUNK CLASS LEAD WILL BE GROUNDED TO MARKER.

RELEASE MARKER PRIMING: SETS THE STEERING CHAIN FOR REGISTERING MARKER PRIMING INFORMATION.

NEEDED TO POSITION TTY PAGE PRINTER.

UNLOCKS STEERING CIRCUIT SO THAT FOLLOWING DIGITS WILL BE READ.

MARKER GROUP: THIS GIVES THE MARKER GROUP IN WHICH TRUNKS TO BE TESTED ARE ASSIGNED. IN A SINGLE MARKER GROUP OFFICE THIS WILL ALWAYS BE "0."

TRANSLATION MARK: DETERMINES WHICH TRANSLATION FIELD THE MARKER WILL USE TO GAIN ACCESS TO DESIRED TRUNKS. ALSO MODIFIES OUTGOING SENDER INSTRUCTIONS IN COMBINATION WITH TEST INFORMATION.

FAR END TEST LINE OR ROTL DIRECTORY NUMBER (SEE TABLE 5, PART 3)

EXTRA INFORMATION DIGIT

TRUNK CLASS: ESTABLISHES TESTING MODE OF THE TEST FRAME.

CLASS OF SERVICE: DUAL PURPOSE AREA – SEE NOTE.

RATE TREATMENT: REQUIRED ONLY WHEN MARKER GROUP IS EQUIPPED WITH RATE TREATMENT; OTHERWISE, THESE POSITION ARE OMITTED.

ALLOTED GROUP–ROUTE ADVANCE: USED TO INSTRUCT MARKER TO PROPER SUB-GROUP OF TRUNKS WHEN TRUNK GROUP EXCEEDS 20 TRUNKS PER TRUNK LINK FRAME OR WHEN GROUPS ARE ALLOTED FOR ALTERNATE USE. IN MOST CASES THIS DIGIT WILL BE 4.

TEST INFORMATION: USED TO ESTABLISH PROPER SUPERVISION MODE OF THE TEST FRAME.

STEP–BY–STEP AOTT FRAME
SD–32504–01

28 TTY	TTY			TRUNK GROUP PRIMING (FOR OPERATIONAL TESTING)																				DIRECTORY NUMBER								
	FIG. SHIFT	CONN. CIR.	CLEAR REG.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(N)	AS	BS	CS	DS	ES	FS	GS	HS
	↑	$	!	/, .	0,1	0,1,:	0,1,:	0,1,:	0,1,:	0,1,:	0,1,:	0,1	0,1	0,1	0,1	0,1	:	:	:	:	:	:	:	:	:	:	,	0-9	0-9	0-9	0-9	0-9	0-9	0-9	🔔

INSTRUCTS AOTT TO LOOK FOR FOLLOWING $

IF PRECEEDED BY A FIGURES SHIFT, INSTRUCTS AOTT TO CONNECT THE TEST CIRCUIT

INSTRUCTS THE AOTT TO CLEAR THE RELAY REGISTERS

SPECIFIES TYPE OF TEST:
/ = TRANSMISSION TEST
. = OPERATIONAL TEST

0 = TEST WILL BE MADE BY AOTT
1 = TEST WILL BE MADE VIA ROTL

0 = IF ENTRY 2 = 1
: = FILLER (USED IF ENTRY 2 = 0)

0 = NORMAL TRANS. OR OP. TEST
: = FILLER IF TEST VIA ROTL (ENTRY 2 = 1)

0 = NO PREFIX DIGIT REQUIRED TO REACH ROTL
1 = PREFIX 1 REQUIRED TO REACH ROTL
: = IF TEST MADE BY TEST FRAME

0 = IF TRUNK TERMINATES IN OFF. WITHOUT COM. CONT. EQUIP.
1 = IF TRUNK TERMINATES IN OFF. WITH COM. CONT. EQUIP.
: = FILLER IF TEST VIA ROTL (ENTRY 2 = 1)

0 = IF TRUNK DOES NOT USE MF PULSING
1 = IF TRUNK REQUIRES MF PULSING
: = FILLER IF TEST VIA ROTL (ENTRY 2 = 1)

0 = IF TRUNK DOES NOT USE SIMPLEX SIGNALING
1 = IF TRUNK REQUIRES SIMPLEX SIGNALING
: = FILLER IF TEST VIA ROTL (ENTRY 2 = 1)

POSSIBLE ENTRIES IF OPERATIONAL TEST (ENTRY 1 = .)

SELECTOR REST POSITION (ALWAYS :)

INSTRUCTS AOTT THAT DIRECTORY NUMBER FOLLOWS

MAY BE 1–7 DIGITS

INSTRUCTS AOTT THAT DIRECTORY NUMBER IS COMPLETE. MUST IMMEDIATELY FOLLOW THE DIRECTORY NUMBER.

IF AN OPERATIONAL TEST IS TO BE MADE (ENTRY 1 = .) :

ENTRY 9 = {1 IF TEST IS TO BE MADE TO SYNCHRONOUS TEST LINE; 0 OTHERWISE}

ENTRY 10 = {1 IF TEST IS TO BE MADE TO NON-SYNCH. TEST LINE; 0 OTHERWISE}

ENTRY 11 = {1 IF TEST IS TO BE MADE TO 103 (RING-FORWARD) TEST LINE; 0 OTHERWISE}

ENTRY 12 = {1 IF THE TRUNK TO BE TESTED IS A CENTREX TRUNK; 0 OTHERWISE}

ENTRY 13 = {1 IF A BUSY LINE TEST IS TO BE MADE; 0 OTHERWISE}

ENTRIES 14-22 = :(FILLER)

Fig. 16

A COMPARISON OF TRANSMISSION TESTING PARAMETER REQUIREMENTS

28 TTY

NO. 5 CROSSBAR APTT FRAME
SD-25938-01, ISSUE 30 AND LATER

TTY				TRANSMISSION PRIMING												
RELEASE TRS. PRI	CARR. RET.	LINE FEED	FIGURES SHIFT	FE	TPL	EML			LOSS DEV.		NOISE M.L.		NDL	NOISE I.A.L.		DR
(	⟨	≡	↑					•		•			0			

- ↑ UNLOCKS APTT STEERING CIRCUIT SO THAT FOLLOWING DIGITS WILL BE READ.
- ⟨ IGNORED BY APTT; JUST USED TO POSITION THE TTY PAGE PRINTER.
- (SETS THE STEERING CHAIN TO REGISTER TRANSMISSION PRIMING.

28 TTY

STEP-BY-STEP AOTT FRAME
SD-32504-01

TRUNK GROUP PRIMING (FOR TRANSMISSION TEST)													
9	10	11	12	13	14	15	16	17	18	19	20	21	22
DR	OHM	FE	TPL	EML			LOSS DEV.		NOISE M.L.		NDL	NOISE I.A.L.	
	6,9				•			•			0		

- 6,9 INDICATES THE IMPEDANCE AT WHICH MEASUREMENT IS TO BE MADE, 600 OR 900 OHMS.

35 TTY

NO. 4 CROSSBAR AOTT FRAME
SD-68580-01

TTY			TRANSMISSION PRIMING													
DC I	RUB OUT	RUB OUT	FE	DR	EML				LOSS DEV.			NOISE M.L.		NDL	NOISE I.A.L.	
I	⟵	⟵					•			•				0		

- ⟵ NEEDED TO INSURE RELAY HAS TIME TO OPERATE.
- I INSTRUCTS AOTT TO STORE THE TRANSMISSION PRIMING DIGITS THAT FOLLOW.

NO. 4 CROSSBAR ADOIT TEST FRAME
SD-68588-01

1		8	9	10	11	12	13	14	15	16	17	18	19	20
IBM CARD														
Y		FE	DR	EML			LOSS DEV.		NOISE M.L.		NDL	NOISE I.A.L.		

- Y INSTRUCTS THE ADOIT THAT THIS CARD CONTAINS PRIMING INFORMATION.

EXPLANATION OF TRANSMISSION DIGITS THAT ARE PASSED TO THE ATMS DIRECTOR

FE – FAR END TEST LINE TYPE:

THIS ENTRY INDICATES WHETHER THE TEST WILL BE MADE TO A 100-, 102-, 104-, OR 105-TYPE TEST LINE.

DR – DEVIATION REGISTERS:

THIS ENTRY IS 1 IF THE LOSS AND NOISE DEVIATION MEASUREMENTS ARE TO BE SCORED ON THE ATMS DEVIATION REGISTERS OR 0 IF THE MEASUREMENTS ARE NOT TO BE SCORED.

TPL – TEST PAD LOSS:

THIS ENTRY INDICATES WHETHER THE TRUNK IS TO BE TESTED DIRECTLY OR THROUGH A 2 DB TEST PAD.

EML – EXPECTED MEASURED LOSS:

ANY VALUE, 00.0 – 11.3 DB. SEE PARA. 3.25 REGARDING LOSSES OVER 11.3 DB.

LOSS DEV. – LOSS DEVIATION LIMIT:

MAY BE ONE OF 10 VALUES – 0.4, 0.6, 0.8, 1.0, 1.2 DB, 1.5, 2.0, 2.5, 3.0, 3.5 DB.

NOISE M.L. – NOISE MAINTENANCE LIMIT:

ANY VALUE, 20 – 48 DBRNC.

NDL – NOISE DEVIATION LIMIT:

ALWAYS 0.

NOISE I.A.L. – NOISE IMMEDIATE ACTION LIMIT:

MAY BE ONE OF 10 EVEN NUMBERS – 30, 32, 34, 36, 38 DBRNC, 40, 42, 44, 46, 48 DBRNC.

Fig. 17

A COMPARISON OF TRUNK ACCESS INSTRUCTION REQUIREMENTS

28 TTY

NO. 5 CROSSBAR APTT FRAME
SD-25938-01, ISSUE 30 AND LATER

TTY			TRUNK PRIMING																		
CARR. RET.	LINE FEED	FIG. SHIFT	ASN	ASH	IHT	ITT	IUT	TRUNK NUMBER				FT/ RDA	FU/ RDB	TT/ RDC	TU/ RDD	RDE	START COPY	SPACE	CHANNEL NUMBER		STOP COPY
⟨	≡	↑	0-9	0-9	0-9	0-9	0-9					0-2	0-9	0-7	0-9	0-9	#	■			"

OMITTED UNLESS REQUIRED FOR OPERATIONAL TEST

OMITTED UNLESS REQUIRED FOR ROTL TEST.

FT, FU - TRUNK LINK FRAME NUMBER FOR APTT TEST.
TT, TU - TRUNK TEST LEAD NUMBER FOR APTT TEST.
RDA-RDE - ROTL PRIMING FOR ROTL TEST.

NOTES: IF A TRUNK NUMBER HAS FEWER THAN FOUR DIGITS, THE UNUSED LEADING POSITIONS SHOULD BE FILLED WITH PERIODS.

IF A CHANNEL NUMBER HAS ONLY ONE DIGIT, THE FIRST POSITION SHOULD BE FILLED WITH A PERIOD. IF THERE IS NO CHANNEL NUMBER, THE POSITIONS SHOULD BE LEFT BLANK AND NOT PUNCHED.

28 TTY

STEP-BY-STEP AOTT FRAME
SD-32504-01

| TTY | | | TRUNK PRIMING (AOTT TEST) | | | | | | | | | | | OR | TTY | | | | | TRUNK PRIMING (ROTL TEST) | | | | | | | | | | | | | | | | | |

10. INPUT DATA FORMS AND EXAMPLES OF USE

10.01 Three different sets of forms are provided herein for use in data compilation for tape or card preparation. The three sets are:

(a) Tape or Card Preparation Worksheets intended to be used with the manual/mechanized procedures described in Part 11.

(b) Trunk Maintenance File Worksheets intended for entering change information in either of the two computer processes described in Part 11.

(c) Office Description Forms for use in assembling information such as arrangements for automatic trunk testing in each office, ROTL directory numbers, and test connector assignments.

10.02 The tape and card preparation worksheets (Fig. 35 through 42) and the ruler (Fig. 23) have been assigned E numbers and may be ordered through Western Electric Company. Other forms in this section may be obtained by duplicating them locally.

10.03 Examples of completed worksheets are illustrated using the office configuration shown in Fig. 19.

A. Tape and Card Preparation Worksheets

10.04 These forms are designed to aid in assembling the required information in the proper format for manual tape or card preparation. The format is that required by the test frames, including control characters. Trunks must be listed on these worksheets in the desired test sequences as specified in Part 2. Table 27 provides more detail on the three sequences: facility, trunk group by facility, and trunk group by trunk number. Table 28 provides a detailed list of facility types that correspond to the various testing intervals.

10.05 Figure 35 is a worksheet for preparing preamble information for any of the three types of test frames which are controlled by paper tapes. The format for preambles on the ADOIT is shown on the Card Preparation Worksheet Ruler, Fig. 23. For the SXS AOTT, a series of three sets of FIGURES SHIFT followed by LETTER SHIFT (6 characters) must be punched on the tape. Each FIGURES SHIFT—LETTERS SHIFT pair causes the test circuit to be disconnected from the teletypewriter transmitter-distributor and causes the printer and reperforator to be connected to the TD. Since the reperforator is not connected until the completion of the first FIGURES-LETTERS pair, additional pairs are required to enable a retest tape to print the caption information. The three pairs specified above will permit the use of up to two retest tapes.

Caution: If a preamble is not used for the SXS AOTT, the sequence of FIGURES SHIFT-LETTERS SHIFT described above must be inserted first prior to the first caption information.

10.06 An example of the use of each of these worksheets has been constructed to correspond to the sample printouts in Parts 3 through 6. Table 25 lists the figures that correspond for each type of test frame. Note that, in these examples, trunks have been listed by facility in channel number order.

10.07 The Step-by-Step worksheets shown in Fig. 38 and 39 have two different sets of columns for trunk priming information. If the tests are to be made via ROTL, the right hand set is used. Otherwise the left hand set should be used. On the corresponding forms for the APTT and the No. 4 Crossbar AOTT, only one set of columns is required.

10.08 The key at the top of the worksheet for the ADOIT, Fig. 24, gives the format for trunk (Y-type) cards. The ruler shown in Fig. 23 is designed to match the columns of this worksheet and contains the format for preamble (W-type), time (T-type) and caption (W-type) cards. Whenever preamble, time, or caption data must be entered on a line of the worksheet, the appropriate edge of the ruler is placed just above the line. The cards will then be in order for the test frame when they are punched.

10.09 Although not discussed elsewhere in this section, Tape Preparation Worksheets have also be provided for earlier versions of the APTT and are shown in Fig. 43 and 44. These latter forms are for operational testing only since earlier versions of the APTT do not work with ATMS.

B. Trunk Maintenance File Worksheets

10.10 The three worksheets shown in Fig. 45, 46, and 47 are designed for entering change information in either of the two computerized preparation procedures described in Part 11. The format of these forms has been arranged for convenience and is not in the order required by the test frames. Control characters and information such as test line numbers that can be obtained from table look-ups are not entered on the forms but are inserted automatically by the computer. Trunks may be listed on these forms in whatever sequence is most convenient. The computer takes care of providing the requisite tapes and sequences specified in Part 2. Figures 25, 26, and 27 contain example data entered on these forms.

10.11 The worksheet shown in Fig. 45 represents Common File Information required by all of the test frames. This includes trunk group identification, facility group identification, transmission testing parameters, and trunk priming. This sheet is all that is required for the No. 4 Crossbar AOTT and ADOIT. It is used in conjunction with Fig. 46 for the APTT and with Fig. 47 for the Step-by-Step AOTT. The trunk location address entries, Columns 11 through 16 in the trunk priming field on Fig. 45, will vary depending on the type of test frame or ROTL by which the trunk is tested. Table 26 defines the format for these entries.

10.12 The worksheet shown in Fig. 46 is used for entering additional information required by the No. 5 Crossbar APTT. This includes marker priming digits for line-link pulsing trunks and CAMA incoming trunk circuit tests. The trunk group identification and the trunk number are repeated on this form to key the information on this form with related information on the Common File Information Form, Fig. 45. For entering transmission testing information, both worksheets are needed. For entering operational testing information, only the No. 5 Crossbar Worksheet, Fig. 46, is needed.

10.13 The worksheet shown in Fig. 47 is used for entering additional information required by the Step-by-Step AOTT test frame. This includes test frame priming for both transmission and operational tests. The trunk group identification and trunk priming fields are repeated on this form to key the information on this form with related information on the Common File Information Form, Fig. 45. For entering transmission testing information, both worksheets are required. For entering operational testing information, only the worksheet of Fig. 47 is needed.

10.14 The entries on these worksheets are divided into separate data fields each preceded by a code letter. The trunk group identification field is preceded by one of five action codes. These codes are used to indicate the type of change being made in the Trunk Maintenance File as follows:

A = addition of a new trunk group to the file

B = addition of trunks to a trunk group already in the file

C = change in file information for one or more trunks from the file

D = deletion of one or more trunks from the file

E = change in trunk group identification or trunk number for one or more trunks already in the file.

An E entry identifies the file to be changed and must be immediately followed by a C entry indicating the corrected identification.

10.15 Whenever an A or B entry occurs on any of these forms, all other fields on that form must also be entered for the first trunk. For subsequent trunks, only those fields that have changed from the preceding trunk need be entered. (See examples 1 and 2 on Fig. 25, 26, and 27.)

10.16 Change entries (C code) must contain the trunk group identification and the trunk number. Other data fields need be entered only if changes are to be made in those fields. Fields omitted will remain unchanged in the file. (See example 3 on Fig. 25.) If the change applies to all trunks in the trunk group, the word ALL may be entered in the trunk number field. If it applies to several trunks, successive H fields may be used.

10.17 Delete entries (D code) only require the trunk group identification and trunk number. If an entire trunk group is to be deleted from the file, the word ALL may be entered in the trunk number field. (See examples 4 and 5 on Fig. 25.)

10.18 If a change in trunk group identification or trunk number is required, first locate the identification to be changed and then change it. The purpose of the E code is to locate the appropriate trunks according to their old identification. An E entry must be immediately followed by a C entry containing the corrected identification. (See examples 6 and 7 on Fig. 25 and 26, respectively.) Here also, if the change applies to all trunks in a trunk group, the word ALL may be entered in the trunk number field.

C. Office Description Forms

10.19 These forms shown in Fig. 28 through 34 are provided to aid in assembling information required at Tape and Card Administration Centers. These forms will be needed initially and from time to time as changes occur in testing arrangements, but will not be needed as frequently as the worksheets described previously.

10.20 Form ODF-A (Fig. 28) is a summary sheet to be completed for each office. It indicates the type of test arrangement and determines what other ODF forms must be completed and attached. In the example of Fig. 19, the MIAMFLMA642 office would check the first space since it is a No. 5 Crossbar office equipped with an APTT.

10.21 Form ODF-B (Fig. 29) is used to assemble data that is necessary to test CAMA incoming trunk circuits from an APTT frame. These trunk circuits are assigned in terms of relay rack and circuit. The APTT requires the related CAMA test switch assignments. See Part 3 for definitions of these entries.

10.22 Form ODF-C (Fig. 30) is used to record the route translation assignments for the 20 trunk groups that can be tested via a No. 5 Crossbar ROTL.

10.23 Form ODF-D (Fig. 31) is provided for use with either the Step-by-Step AOTT or the Step-by-Step ROTL. Both of these testing arrangements use a test connector to gain access to trunks. Since

the test connector positions are directly cabled to the trunk relay equipment, the test connector assignments should be entered on this form.

10.24 Form ODF-E (Fig. 32) is used with No. 4XB ADOIT or AOTT frames to record the test connector assignment that corresponds to the trunk appearance of each trunk to be tested. No. 4 Crossbar test connectors are wired to trunk equipment at installation. Ordinarily, this relationship will not be changed unless there is a major office revision. Additions do not affect existing assignments as a rule.

10.25 In the case of No. 5 Crossbar offices the relationship between trunk equipment assignment (switch, level, and appearance) and the test access information (busy test lead) is required as part of the APTT priming. It may be either fixed or flexible. (See Table 8 in Part 3.) Forms ODF-F (Fig. 33) and ODF-G (Fig. 34) provide the information necessary to translate from one to the other.

TABLE 25

TAPE AND CARD PREPARATION WORKSHEETS

TEST FRAME	WORKSHEET EXAMPLE	RESULTING PRINTOUT	BLANK FORMS
1. No. 5 Crossbar APTT	Fig. 20	Fig. 5 (part 3)	Figs. 36, 37
2. Step-by-Step AOTT	Fig. 21	Fig. 6 (part 4)	Figs. 38, 39
3. No. 4 Crossbar AOTT	Fig. 22	Fig. 7 (part 5)	Figs. 40, 41
4. No. 4 Crossbar ADOIT	Fig. 24	Fig. 8, 9 (part 6)	Fig. 42
5. Earlier APTTs (non-ATMS)	—		Figs. 43, 44

TABLE 26

TRUNK LOCATION ADDRESS FORMATS FOR USE WITH TRUNK MAINTENANCE FILE COMMON FILE INFORMATION WORKSHEET*

TEST UNIT	COLUMN 11	COLUMN 12	COLUMN 13	COLUMN 14	COLUMN 15	COLUMN 16
APTT-5XB			FT	FU	TT	TU
AOTT-SXS			Test Connector Number			
AOTT-4XB	Train	Test Connector Number				**
ADOIT-4XB	Train	Test Connector Number				
ROTL-5XB	Route Trans.		FT	FU	TT	TU
ROTL-SXS				Test Connector Number		

* See Fig. 25 and 45, Trunk Priming Field.

**For AOTT arranged only for 10,000 trunk access, completely disregard column 16. (See 5.14.)

TABLE 27

THE THREE TRUNK TEST SEQUENCES

(F) Facility Sequence

— Originating Office of the Trunk
Subgrouped by

— Terminating Office of the First Link Facility
Subgrouped by

— Facility Identification (Number and Type)
Arranged by

— Facility Channel (if carrier)

(TF) Trunk Group By Facility:

— Originating Office of the Trunk
Subgrouped by

— Terminating Office of the Trunk
Subgrouped by

— Trunk Type
Subgrouped by

— Type of Pulsing
Subgrouped by

— Terminating Office of the First Link Facility
Subgrouped by

— Facility Identication (Number and Type)
Arranged by

— Facility Channel (if carrier)

(T) Trunk Group By Trunk Number:

— Originating Office of the Trunk
Subgrouped by

— Terminating Office of the Trunk
Subgrouped by

— Trunk Type
Subgrouped by

— Type of Pulsing
Arranged by

— Trunk Number

TABLE 28

TEST INTERVALS FOR VARIOUS FACILITY TEST GROUPS

TEST INTERVAL SECT. 660-402-300	FACILITY TEST GROUP COMMON LANGUAGE IDENTIFICATION SECT. 005-220-101
Daily	C, D, G, H, J, K, N, N1 OA, OB, OC, OD, ON L, R, without Group Regulation 23A, 33A, 42A, 45A, 45C, AD AC, BP, BU, CG, CN, ER, FH, GE, KE, LM, LY, MT, NE, PH, PN, RC, RY, SC
Weekly	L, R with Group Regulation N2, N3, T1, T2
Semimonthly	E13, E23, E6, V4, 24V4, 44V4 Other VF Repeaters
Monthly	CA, OW (Non-Repeatered)

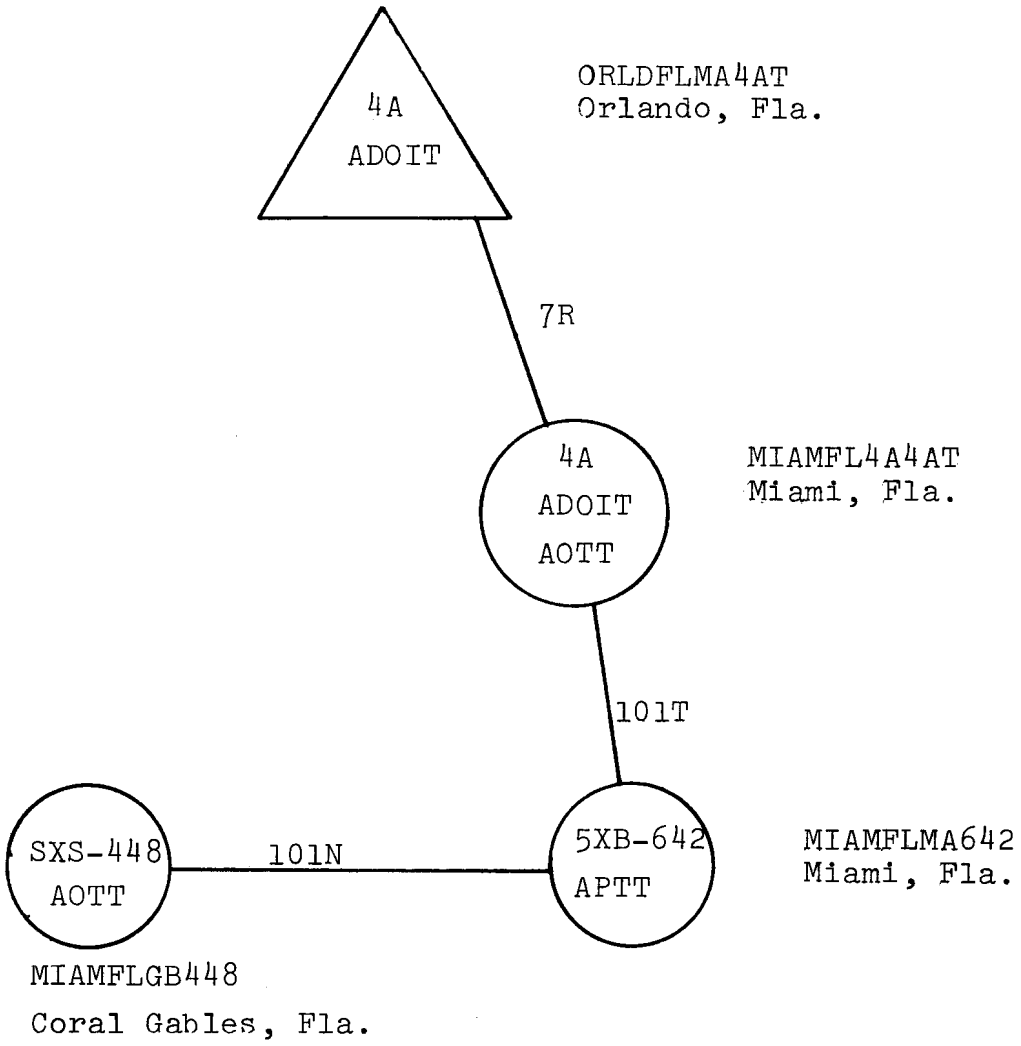


Fig. 19—Office Configuration for Example Date Entered on Worksheets

BSP 218 – 220 – 301
218 – 220 – 303
800 – 102 – 100

TAPE PREPARATION WORKSHEET
NO. 5 CROSSBAR APTT FRAME
SD – 25938 – 01, ISSUE 30 AND LATER, WITH TAPE SIMPLIFICATION

E – 6122 (1/72)
Sheet 1 Of 1
Date 10/15/69
Tape Type T1

GROUPING METHOD	TEST GROUP FACILITY	TEST LINE TYPE	ACCESS MODE
X F TF T	N1	105	Subscriber

| TTY | CAPTION INFORMATION | | |

TAPE PREPARATION WORKSHEET
STEP – BY – STEP AOTT FRAME

SD – 32504 – 01

BSP 226 – 591 – 300
800 – 102 – 100

E – 6126 (4/72.)
Sheet 1 Of 1
Date 10/15/69
Tape Type TS

GROUPING METHOD	TEST GROUP FACILITY	TEST LINE TYPE
X F TF T	N1	105

TTY	CAPTION INFORMATION																																TTY	
	ORIGINATING OFFICE											TERMINATING OFFICE											TRUNK TYPE											
↑	↓	<	=	»	»	TOWN				STATE		BLDG.		UNIT			PLUS ING		TOWN				STATE		BLDG.		UNIT			TRAFFIC CLASS	OFFICE CLASSES	TRAFFIC USE								<	=
↑	↓	<	=	≡	≡	M	I	A	M	F	L	G	B	4	4	8		D	D		M	I	A	M	F	L	M	A	L	4	2		H	U	5	5	I	E					<	=

TTY		TEST GROUP		FACILITY IDENTIFICATION												FACILITY TERMINAL										TTY	
		FACILITY				NUMBER						TYPE				TOWN				STATE		BLDG.				<	=
<	=	N	1							1	Ø	1	N	1						M	I	A	M	F	L	M	A	<	=

INDICATES SPACE

TTY						TEST FRAME PRIMING																							FAR END TEST LINE OR ROTL DIRECTORY NUMBER *									
<	=	↑	↕	!		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	,	AS	BS	CB	DS	ES	FS	GS	HS
FOR TRANSMISSION TESTING –																																						
<	≡	↑	$	!		/	Ø	:	:	Ø	1	Ø	Ø	Ø	9	5	Ø	Ø	2	5	Ø	8	2	8	Ø	4	Ø	:	,	1	2	9	9	Δ					
FOR OPERATIONAL TEST LINE TESTING –																																						
						.												Ø	:	:	:	:	:	:	:	:	:	:												
FOR OPERATIONAL BUSY LINE TESTING –																																						
						.												0	0	0	0	1	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:

* A BELL SYMBOL (UPPER CASE S) MUST IMMEDIATELY FOLLOW THE LAST DIGIT OF THIS NUMBER

| TTY | | | TRUNK PRIMING | | | | | | | | | | | | | | | | | | |

E – 6128 (12/72)
Sheet 1 Of 1
Date 10/13/69
Tape Type T1

TAPE PREPARATION WORKSHEET
NO. 4 CROSSBAR AOTT FRAME

SD – 68580 – 01

BSP 212 – 512 – 301
800 – 102 – 100

GROUPING METHOD					
X	F		TF		T

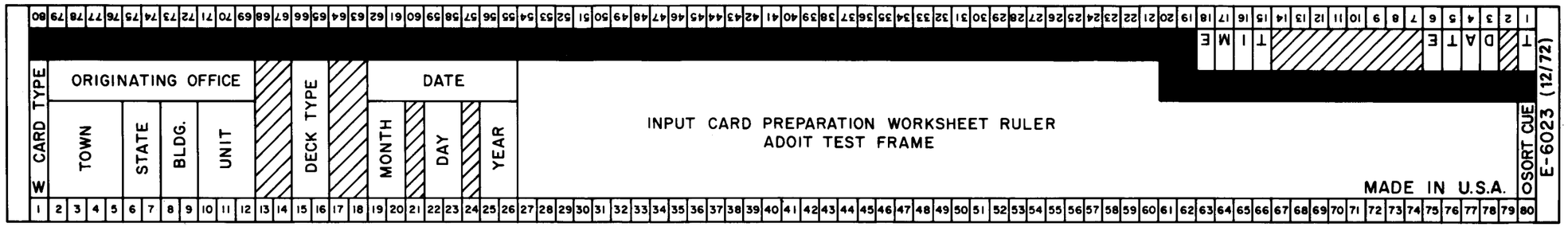
TEST GROUP FACILITY
T1

TEST LINE TYPE
105

| TTY | | | | | | | CAPTION INFORMATION | | | | | | |

INPUT CARD PREPARATION WORKSHEET RULER
ADOIT TEST FRAME
PREAMBLE, TIME, AND CAPTION CARD FORMATS

FRONT PANEL:



BACK PANEL:

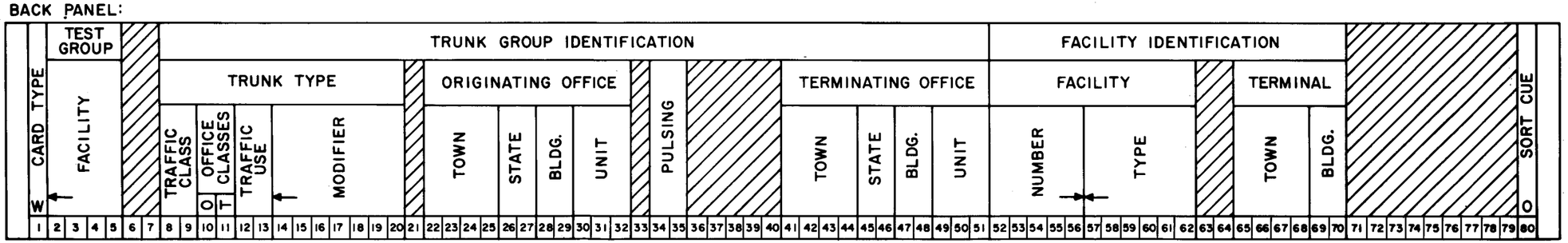


Fig. 23

ADOIT-4XB: BSP 212-514-301

INPUT CARD PREPARATION WORKSHEET
ADOIT TEST FRAME
TRUNK (Y-TYPE) CARD FORMAT

E-6022 (12/72)

SHEET 1 OF 1

DATE 10/15/69

CARD TYPE	TEST FRAME PRIMING																			TEST INTERVAL	TRUNK IDENTIFICATION																FACILITY IDENTIFICATION							TEST NUMBER	DATE			
									LOSS LIMITS				NOISE LIMITS				ORIGINATING OFFICE				TRAFFIC			TERMINATING OFFICE							TERMINAL															
	TRAIN	TEST CONNECTOR NUMBER						F.E. TEST LINE	DEV. REG.	EML		DEVIATION		MTCE.	DEVIATION	IMMED. ACT.			TOWN	STATE	BLDG.	UNIT	CLASS	USE	TRUNK NUMBER	TOWN	STATE	BLDG.	UNIT			NUMBER		TYPE		CHANNEL		TOWN	BLDG.			MONTH	DAY	YEAR		
Y																																							O					
1	2	3 4 5 6 7						8	9	10 11		12 13 14		15 16	17	18 19		20	21	22 23 24 25		26 27	28 29	30 31 32		33 34	35 36	37 38 39 40		41 42 43 44		45 46 47 48		49 50 51		52 53 54 55		56 57 58 59 60 61 62		63 64	65 66 67 68		69 70	71	72 73 74 75 76 77		78 79 80
W	M	I A M F L						4	A	4	A	T		T	I					1 Ø / 1 5 / 6 9																											
T	D	A T E												T	I	M	E																													
W	R						H	U	3	2	I	T								M I A M F L		4	A	4	A	T	M	M				O	R	L	D	F	L	M	A	4	A	T			7	R						O	R	L	D	M	A						
Y	A	Ø 2 2 1		2 5 1		Ø 4 5		Ø	8	4	1	Ø 4 6							1	M I A M F L		4	A	4	A	T	H	U	I	T	.	.	1	8	O	R	L	D	F	L	M	A	4	A	T			7	R				Ø	2	O	R	L	D	M	A						
Y	A	Ø 2 2 1		Ø 5 1		Ø 4 5		Ø	8	4	1	Ø 4 6							1	M I A M F L		4	A	4	A	T	H	U	I	T	.	.	3	Ø	O	R	L	D	F	L	M	A	4	A	T			7	R				Ø	3	O	R	L	D	M	A						
Y	A	Ø 2 2 1		3 5 1		Ø 4 5		Ø	8	4	1	Ø 4 6							1	M I A M F L		4	A	4	A	T	H	U	I	T	.	.	2	4	O	R	L	D	F	L	M	A	4	A	T			7	R				Ø	4	O	R	L	D	M	A						
Y	A	Ø 2 2 Ø		9 5 1		Ø 4 5		Ø	8	4	1	Ø 4 6							1	M I A M F L		4	A	4	A	T	H	U	I	T	.	.	1	2	O	R	L	D	F	L	M	A	4	A	T			7	R				Ø	5	O	R	L	D	M	A						

** SEE CARD PREPARATION WORKSHEET FOR FORMAT OF W- AND T- TYPE CARDS

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Fig. 24

ACTION CODES:
A = ADD, TRUNK GROUP IDENT. NEW IN FILE
B = ADD, TRUNK GROUP IDENT. ALREADY IN FILE
= CHANGE, FILE DATA OTHER THAN TRUNK IDENT.
D = DELETE
E = CHANGE, TRUNK IDENT.

TRUNK MAINTENANCE FILE WORKSHEET
COMMON FILE INFORMATION
ATMS TAPE AND CARD PREPARATION, BSP 800-102-100

SHEET 1 OF 3
DATE 10/15/69

| TRUNK GROUP IDENTIFICATION | | |

ACTION CODES
A = ADD TRUNK GROUP IDENT NEW IN FILE
B = ADD TRUNK GROUP IDENT ALREADY IN FILE
C = CHANGE FILE DATA OTHER THAN TRUNK IDENT
D = DELETE
E = CHANGE TRUNK IDENT

TRUNK MAINTENANCE FILE WORKSHEET
NO. 5 APTT FRAME FILE INFORMATION
ATMS TAPE AND CARD PREPARATION, BSP 800-102-100

SHEET 2 OF 3
DATE 10/15/69

TRUNK GROUP IDENTIFICATION															MARKER PRIMING													MARKER PRIMING													MARKER PRIMING													TRUNK PRIMING																	
ACTION	ORIGINATING OFFICE					TERMINATING OFFICE					TRUNK TYPE																

ACTION CODES:
A = ADD. TRUNK GROUP IDENT. NEW IN FILE
B = ADD. TRUNK GROUP IDENT. ALREADY IN FILE
C = CHANGE. FILE DATA OTHER THAN TRUNK IDENT.
D = DELETE
E = CHANGE. TRUNK IDENT.

TRUNK MAINTENANCE FILE WORKSHEET
SXS AOTT FRAME FILE INFORMATION
ATMS TAPE AND CARD PREPARATION, BSP 800-102-100

SHEET 3 3
DATE 10/15/69

| TRUNK GROUP IDENTIFICATION | | |

OFFICE DESCRIPTION FORM

ODF-A

TRUNK MAINTENANCE FILE DATA
SUMMARY OF OFFICE INFORMATION

DATE: _____

OFFICE LOCATION: |_|_|_|_|_|_|_|_|_|_|_|

NNX NUMBERS ASSIGNED TO THIS OFFICE: ____,____,____,____

ITEM (√)	TEST ARRANGEMENT	INFORMATION REQUIRED
____	NO. 5 XB APTT	TEST FRAME ISSUE _____ ADDITIONAL TEST FEATURES: _____ (√) CAMA INCOMING OR INTERMARKER GROUP TRUNKS. (FORM ODF-B ATTACHED) _____ (√) LINE LINK PULSING-TRUNK LINK FRAME APPEARANCE OF APTT FRAME _____
____	NO. 5 XB ROTL	CONTROL OFFICE |_|_|_|_|_|_|_|_|_|_|_| ROTL DIRECTORY NUMBER _____ (FORM ODF-C ATTACHED)
____	SXS AOTT	TEST CONNECTOR ASSIGNMENTS (FORM ODF-D ATTACHED)
____	SXS ROTL	TEST CONNECTOR ASSIGNMENTS (FORM ODF-D ATTACHED) CONTROL OFFICE |_|_|_|_|_|_|_|_|_|_|_| ROTL DIRECTORY NUMBER _____
____	NO. 4 XB ADOIT-AOTT	TRUNK BLOCK TO TEST CONNECTOR ASSIGNMENT (FORM ODF-E ATTACHED)

ROTL RESULTS TELETYPE NUMBER _____

PREPARED BY _____ TELEPHONE NUMBER _____

Fig. 28

OFFICE DESCRIPTION FORM

TRUNK MAINTENANCE FILE DATA
NO. 5XB APTT OFFICE
CAMA INC. OR IMG TRUNKS

ODF-B

DATE: _____

APTT OFFICE

CAMA TEST SWITCH ASSIGNMENT								
TRUNK EQUIPMENT		MACHINE TRUNK NUMBER			TEST SWITCH			
RELAY RACK	CKT.	IHT	ITT	IUT	TT O/1	CST ASN	CSU ASH	TU SSN

PREPARED BY _____ TELEPHONE NUMBER _____

Fig. 29

OFFICE DESCRIPTION FORM

ODF-C

TRUNK MAINTENANCE FILE DATA
NO. 5XB ROTL OFFICE

DATE: _____

ROTL OFFICE |_|_|_|_|_|_|_|_|_|_|

DIRECTORY NUMBER _____

ROUTE TRANSLATION ASSIGNMENT		
ROUTE TRANSLATION NUMBER	TERMINATING OFFICE	TRAF. CLASS AND USE
00		
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		

PREPARED BY _____ TELEPHONE NUMBER _____

Fig. 30

OFFICE DESCRIPTION FORM

ODF-D

TRUNK MAINTENANCE FILE DATA
SXS AOTT OR ROTL OFFICE

DATE: _____

OFFICE |_|_|_|_|_|_|_|_|_|_|

ROTL DIR. NO. _____

TEST CONNECTOR ASSIGNMENT				
TRUNK EQUIPMENT LOCATION	TEST CONNECTOR			
	CONTROL CONNECTOR		TRUNK CONNECTOR	

PREPARED BY _____ TELEPHONE NUMBER _____

Fig. 31

OFFICE DESCRIPTION FORM

ODF-E

TRUNK MAINTENANCE FILE DATA
NO. 4XB ADOIT OR AOTT OFFICE

DATE: _____

OFFICE |_|_|_|_|_|_|_|_|_|_|

___ AOTT

___ ADOIT

TEST CONNECTOR ASSIGNMENT											
CONNECTOR _____ TRAIN _____											
TRUNK BLOCK _____											
RELAY	*	GP.	SW.	HZ.	VT.	RELAY	*	GP.	SW.	HZ.	VT.
00						20					
01						21					
02						22					
03						23					
04						24					
05						25					
06						26					
07						27					
08						28					
09						29					
10						30					
11						31					
12						32					
13						33					
14						34					
15						35					
16						36					
17						37					
18						38					
19						39					

*For ADOIT Test Frame connectors and AOTT Test Frame connectors arranged for access to 20,000 trunks, a 0 or 1 must be entered here. Disregard with AOTTs arranged for only 10,000 trunks.

PREPARED BY _____ TELEPHONE NUMBER _____

Fig. 32

OFFICE DESCRIPTION FORM

ODF-F

TRUNK MAINTENANCE FILE DATA
NO. 5 CROSSBAR APTT OFFICE
TRUNK LINK FRAME TRUNK ASSIGNMENT
TO TEST ACCESS CONVERSION TABLE

A

Appearance

Sw.	Lv.	Busy Test	Sw.	Lv.	Busy Test	Sw.	Lv.	Busy Test
	0	00		0	04		0	08
	1			1			1	
	2			2			2	
	3			3			3	
0	4		4	4		8	4	
	5			5			5	
	6	00		6	04		6	08
	7	10		7	14		7	18
	8	00		8	04		8	08
	9	10		9	14		9	18
	0	01		0	05		0	09
	1			1			1	
	2			2			2	
	3			3			3	
1	4		5	4		9	4	
	5			5			5	
	6	01		6	05		6	09
	7	11		7	15		7	19
	8	01		8	05		8	09
	9	11		9	15		9	19
	0	02		0	06			
	1			1				
	2			2				
	3			3				
2	4		6	4				
	5			5				
	6	02		6	06			
	7	12		7	16			
	8	02		8	06			
	9	12		9	16			
	0	03		0	07			
	1			1				
	2			2				
	3			3				
3	4		7	4				
	5			5				
	6	03		6	07			
	7	13		7	17			
	8	03		8	07			
	9	13		9	17			

Fig. 33

OFFICE DESCRIPTION FORM

ODF-G

TRUNK MAINTENANCE FILE DATA
NO. 5 CROSSBAR APTT OFFICE
TRUNK LINK FRAME TRUNK ASSIGNMENT
TO TEST ACCESS CONVERSION TABLE

B

Appearance

Sw.	Lv.	Busy Test	Sw.	Lv.	Busy Test	Sw.	Lv.	Busy Test
	0	10		0	14		0	18
	1			1			1	
	2			2			2	
	3			3			3	
0	4		4	4		8	4	
	5	10		5	14		5	18
	6	00		6	04		6	08
	7	10		7	14		7	18
	8	00		8	04		8	08
	9	10		9	14		9	18
	0	11		0	15		0	19
	1			1			1	
	2			2			2	
	3			3			3	
1	4		5	4		9	4	
	5	11		5	15		5	19
	6	01		6	05		6	09
	7	11		7	15		7	19
	8	01		8	05		8	09
	9	11		9	15		9	19
	0	12		0	16			
	1			1				
	2			2				
	3			3				
2	4		6	4				
	5	12		5	16			
	6	02		6	06			
	7	12		7	16			
	8	02		8	06			
	9	12		9	16			
	0	13		0	17			
	1			1				
	2			2				
	3			3				
3	4		7	4				
	5	13		5	17			
	6	03		6	07			
	7	13		7	17			
	8	03		8	07			
	9	13		9	17			

Fig. 34

E – 6121 (4/72,)
Sheet ____ Of ____
Date _____

TAPE PREPARATION WORKSHEET
PREAMBLE INFORMATION

NO. 5 CROSSBAR APTT FRAME, ISSUE 30 AND LATER
NO. 4 CROSSBAR AOTT FRAME
STEP – BY – STEP AOTT FRAME

APTT – 5 x B: BSP 218 – 220 – 301 & – 303
AOTT – 4 x B: BSP 212 – 512 – 301
AOTT – S x S: BSP 226 – 591 – 300
ALL: BSP 800 – 102 – 100

APTT – 5XB: ↑ #

AOTT – 4XB: CTL DCO | RUB OUT | RUB OUT

AOTT – SXS: ↑ ↓ ↑ ↓ ↑ ↓

ALL:

| CRT | LNF | LNF | LNF | LNF | LNF | | |

BSP 218 – 220 – 301
218 – 220 – 303
800 – 102 – 100

TAPE PREPARATION WORKSHEET
NO. 5 CROSSBAR APTT FRAME

SD – 25938 – 01, ISSUE 30 AND LATER, WITH TAPE SIMPLIFICATION

E – 6122 (1/72)
Sheet _____ Of _____
Date _____
Tape Type _____

GROUPING METHOD					
	F		TF		T

TEST GROUP FACILITY

TEST LINE TYPE

ACCESS MODE

| CAPTION INFORMATION | | | | |

BSP 218 – 220 – 301
218 – 220 – 303
800 – 102 – 100

SUPPLEMENTARY TAPE PREPARATION WORKSHEET
NO. 5 CROSSBAR APTT FRAME

SD – 25938 – 01, ISSUE 30 AND LATER, WITH TAPE SIMPLIFICATION

E – 6123 (1/72)
Sheet_____Of_____
Date_____
Tape Type _____

TTY			TRUNK PRIMING																				
<	=	↑	ASN CST	ASH CSU	ITH	IHT	ITT	IUT	TRUNK NUMBER					FT/ RDA	FU/ RDB	TT/ RDC	TU/ RDD	RDE	*		CHAN NO.		→

NOTE: INFORMATION IN SHADED AREAS SHALL NOT BE PERFORATED ON THE TAPE

TTY			TRUNK PRIMING																				
<	=	↑	ASN CST	ASH CSU	ITH	IHT	ITT	IUT	TRUNK NUMBER					FT/ RDA	FU/ RDB	TT/ RDC	TU/ RDD	RDE	*		CHAN NO.		→

INDICATES SPACE

Fig. 37

TAPE PREPARATION WORKSHEET
STEP – BY – STEP AOTT FRAME

SD – 32504 – 01

E – 6126 (4/72.)
Sheet____Of____
Date_____
Tape Type_____

BSP 226 – 591 – 300
800 – 102 – 100

GROUPING METHOD					
	F		TF		T

TEST GROUP FACILITY

TEST LINE TYPE

| CAPTION INFORMATION | | | | |

BSP 226 – 591 – 300
800 – 102 – 100

| TTY | | | TRUNK PRIMING | | |

E – 6128 (12-72)
Sheet ____ Of ____
Date ____
Tape Type ____

TAPE PREPARATION WORKSHEET
NO. 4 CROSSBAR AOTT FRAME

SD – 68580 – 01

BSP 212 – 512 – 301
800 – 102 – 100

GROUPING METHOD					
	F		TF		T

TEST GROUP FACILITY

TEST LINE TYPE

| CAPTION INFORMATION | | | | |

BSP 212 – 512 – 301
800 – 102 – 100

SUPPLEMENTARY TAPE PREPARATION WORKSHEET
NO. 4 CROSSBAR AOTT FRAME
SD – 68580 – 01

E – 6129 (12-72)
Sheet ___ Of ___
Date ___
Tape Type ___

TTY					TRUNK PRIMING			TTY		
CTL DC2	RUB OUT	RUB OUT	CRT	LNF	TEST CONNECTOR	TRUNK NUMBER	CHAN. NO.	CTL DC2	RUB OUT	RUB OUT

NOTE: DC2 RUB OUT RUB OUT MUST BE PUNCHED AT THE END OF THE TAPE AFTER THE LAST TRUNK GROUP

NOTE: INFORMATION IN SHADED AREAS SHALL NOT BE PERFORATED ON THE TAPE

TTY					TRUNK PRIMING			TTY		
CTL DC2	RUB OUT	RUB OUT	CRT	LNF	TEST CONNECTOR	TRUNK NUMBER	CHAN. NO.	CTL DC2	RUB OUT	RUB OUT

INDICATES SPACE

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Fig. 41

E-6022 (12/72)

SHEET ____ OF ____

DATE _____

ADOIT-4XB: BSP 212-514-301

INPUT CARD PREPARATION WORKSHEET
ADOIT TEST FRAME
TRUNK (Y-TYPE) CARD FORMAT

CARD TYPE	TEST FRAME PRIMING																			TEST INTERVAL	TRUNK IDENTIFICATION																			FACILITY IDENTIFICATION										TEST NUMBER	DATE			
	TRAIN	TEST CONNECTOR NUMBER					F.E. TEST LINE	DEV. REG.	LOSS LIMITS		NOISE LIMITS										ORIGINATING OFFICE				TRAFFIC			TERMINATING OFFICE					NUMBER				TYPE				CHANNEL	TERMINAL													
									EML		DEVIATION		MTCE.		DEVIATION		IMMED. ACT.				TOWN		STATE	BLDG.	UNIT	CLASS	USE	TRUNK NUMBER	TOWN		STATE	BLDG.	UNIT												TOWN		BLDG.			MONTH		DAY		YEAR			
Y																																																			
–	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

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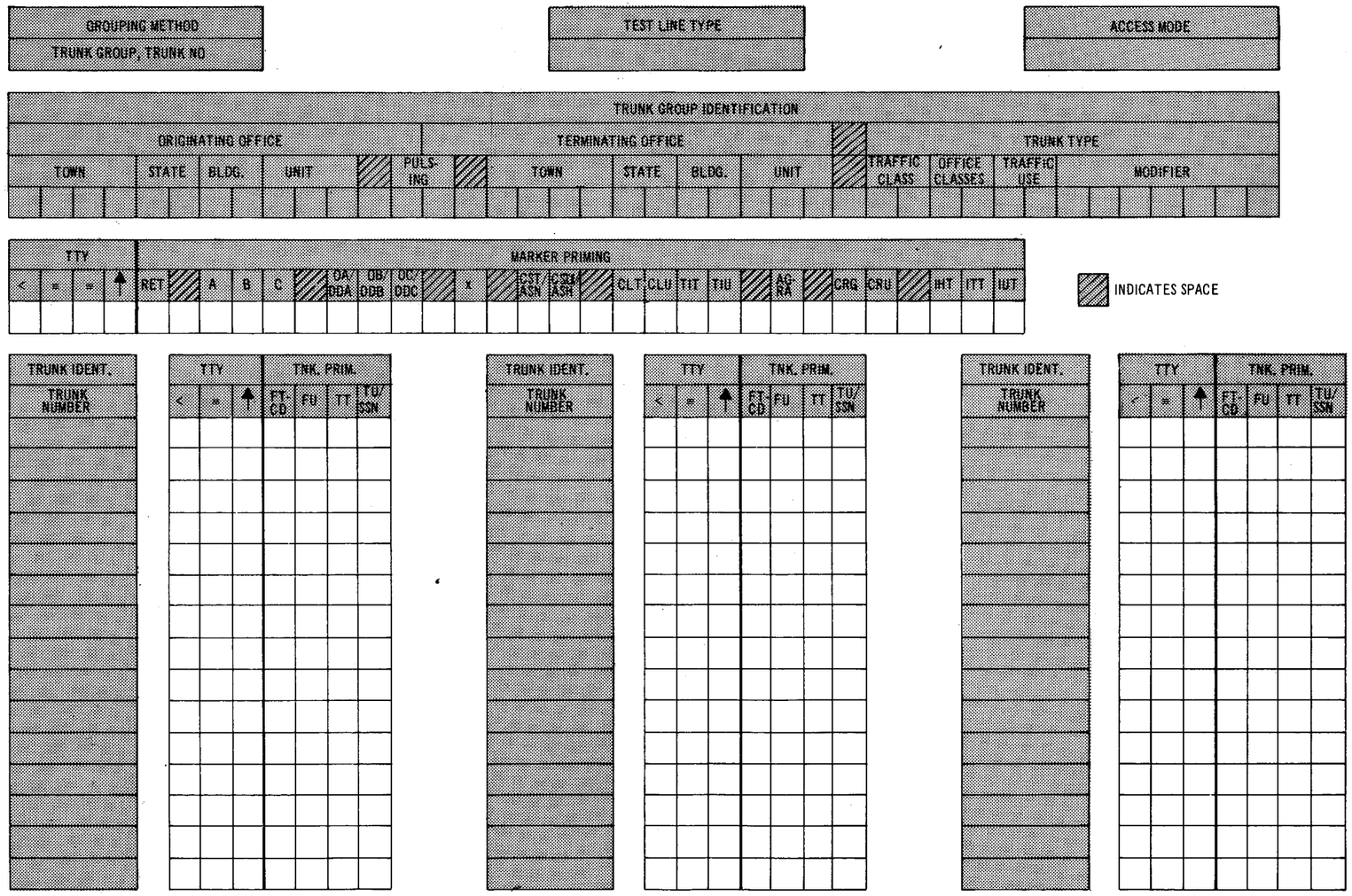
Fig. 42

BSP 218 – 220 – 301
800 – 102 – 100

TAPE PREPARATION WORKSHEET
NO. 5 CROSSBAR APTT FRAME
SD – 25938 – 01, ISSUE 23 – 29, WITH TAPE SIMPLIFICATION

E – 6124 (4/72)
Sheet ____ Of ____
Date _____



NOTE: INFORMATION IN SHADED AREAS SHALL NOT BE PERFORATED ON THE TAPE

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Fig. 43

E – 6125 (1/72)
Sheet ____ Of ____
Date ____

TAPE PREPARATION WORKSHEET
NO. 5 CROSSBAR APTT FRAME

SD – 25938 – 01, PRIOR TO ISSUE 23, NO TAPE SIMPLIFICATION

BSP 218 – 220 – 301
800 – 102 – 100

GROUPING METHOD
TRUNK GROUP, TRUNK NO.

TEST LINE TYPE

ACCESS MODE

| TRUNK GROUP IDENTIFICATION | | |

ACTION CODES:
A = ADD. TRUNK GROUP IDENT. NEW IN FILE
B = ADD. TRUNK GROUP IDENT. ALREADY IN FILE
= CHANGE. FILE DATA OTHER THAN TRUNK IDENT.
D = DELETE
E = CHANGE. TRUNK IDENT.

TRUNK MAINTENANCE FILE WORKSHEET
COMMON FILE INFORMATION
ATMS TAPE AND CARD PREPARATION, BSP 800-102-100

SHEET ____ OF ____

DATE _____

| TRUNK GROUP IDENTIFICATION | | |

ACTION CODES:
A = ADD. TRUNK GROUP IDENT. NEW IN FILE
B = ADD. TRUNK GROUP IDENT. ALREADY IN FILE
C = CHANGE. FILE DATA OTHER THAN TRUNK IDENT.
D = DELETE
E = CHANGE. TRUNK IDENT.

TRUNK MAINTENANCE FILE WORKSHEET
NO. 5 APTT FRAME FILE INFORMATION
ATMS TAPE AND CARD PREPARATION, BSP 800-102-100

SHEET ____ OF ____

DATE _____

| TRUNK GROUP IDENTIFICATION | | |

ACTION CODES:

A = ADD. TRUNK GROUP IDENT. NEW IN FILE
B = ADD. TRUNK GROUP IDENT. ALREADY IN FILE
C = CHANGE. FILE DATA OTHER THAN TRUNK IDENT.
D = DELETE
E = CHANGE. TRUNK IDENT.

TRUNK MAINTENANCE FILE WORKSHEET

SXS AOTT FRAME FILE INFORMATION

ATMS TAPE AND CARD PREPARATION, BSP 800-102-100

SHEET ____ OF ____

DATE _____

| TRUNK GROUP IDENTIFICATION | | |

11. TAPE AND CARD ADMINISTRATION PROCEDURES

11.01 As recommended in Part 1, Tape and Card Administration Centers should be established to monitor plant rearrangement and change activities and to furnish updated control media for each office in a timely manner. Part 11 outlines the responsibilities of these centers and describes procedures for establishing and maintaining a data base for automatic trunk testing known as the Trunk Maintenance File (TMF) and for periodically updating the control media for each office.

11.02 Although there is a considerable amount of work involved in establishing the data base and preparing the initial tapes or card decks for each office, the major reason for these procedures is to provide for keeping these tapes or card decks up-to-date. Thus, the emphasis throughout this description is on updating procedures rather than initial preparation.

A. Information Sources

11.03 The information required to produce a control tape or card deck can be classified as (a) trunk identification, (b) test frame priming, (c) transmission priming, (d) trunk access, (e) test line numbers, and (f) facility identification. As shown in Fig. 48, information is available from three primary functions*: (a) the function of facility assignment, referred to as the Engineering or circuit layout function, (b) the function of trunk equipment assignment, referred to as the Traffic function, and (c) the Plant maintenance function. The appropriate Engineering, Traffic and Plant groups should be requested to forward copies of all circuit orders, traffic orders, and in-effect notices with changes in test connector, test line, or test line access information to the Tape and Card Administration Center.

11.04 While the activities of these various functional groups are often correlated, each source may also act independently. The facility assigned to a specific trunk may be changed without a corresponding change in trunk equipment assignment and vice versa. A machine load and balance adjustment may occur independently as a result of changing traffic patterns in an office. Screening and coordinating these orders to determine what changes are necessary in the TMF is the responsibility of the center.

* Actual organization of these functions will vary between companies.

11.05 Initially, much of the information required to establish the TMF will have to be obtained from the central offices involved. However, after centralized tape and card preparation is under way, as much of the information as possible should be obtained from the other sources so that the information required from the Plant forces is minimized.

B. Functions of Tape and Card Administration Centers

11.06 To establish operations, office description forms, Fig. 28 through 34, Part 10, should be completed for each location showing:

(a) the automatic trunk testing arrangements at each office

(b) the controlling location for each ROTL office

(c) test connector assignment tables

(d) CAMA test switch assignments for No. 5 Crossbar offices

(e) No. 5 Crossbar ROTL route translation assignments.

These forms will also be needed when automatic trunk test equipment is put in service in additional offices.

11.07 Other supporting information that will be required includes:

(a) Test line directory numbers

(b) Section 660-402-300 for loss deviation guides

(c) Section 660-403-500 for noise limits if not provided on the circuit layout record card.

11.08 On receipt of copies of in-effect traffic and circuit orders, the center should screen out those that do not affect trunks originating in test frame- or ROTL-equipped offices or which are not amenable to automatic testing (see Table 29). It should identify associated traffic and circuit orders. Pertinent change information should be entered on the appropriate worksheets, as described in Part 10, for entry into one of the three updating processes to be described.

11.09 At intervals normally not longer than one month and perhaps weekly, the TMF should be updated and new cards or tapes issued for each office. Responsibilities of the center in this updating process include editing and checking input information, maintaining the completenss and accuracy of the TMF, producing and distributing control tapes and card decks, and correcting any errors that occur. Well-defined arrangements should be made for using offices to notify the center directly of any errors in tapes or cards.

11.10 The storage medium for the TMF and the hardware configuration used in the updating procedure is a matter for individual companies to determine based on local considerations. Three alternative processes will be described.

(a) A manual/mechanized process suited to a relatively small operation.

(b) A small computer process suitable for a somewhat larger operation. Use of the computer extends the workload that can be handled by the personnel at the center and decreases the likelihood of error in the process.

(c) A process using a large computer with random access mass storage which is suitable for high-volume tape and card production such as might be needed for an entire company.

The main features of these three processes are summarized in Fig. 49.

C. Flow Charts for a Manual/Mechanized Process

11.11 Figure 50 illustrates a manual/mechanized updating procedure at a tape and card administration center. Copies of circuit layout records (CLR) or trunk orders are received from the engineering groups. Copies of trunk-assignment records are received from the traffic groups. The records which apply to offices which are equiped for automatic testing and to trunk groups which can be tested automatically are placed in pending files. Since the CLR and trunk assignment records come from different sources and may arrive at different times, the central group must be sure that all the information is available and that the work is completed before the TMF is updated. Therefore, the information is sorted and matched (or coordinated) to develop a file of completed records. Since further processing is required, supporting information (the ODF forms and various BSP sections) is needed in order to make up a change record. In this process, change information should be entered on the various Tape or Card Preparation Worksheets provided in Part 10, Fig. 36 through 44.

11.12 A single change may apply to more than one card deck or tape. For example, if a change occurs in the machine appearance of a specific trunk having N1 carrier as the facility test group, then the records for tape or deck T1, T4, and T6 as well as for any operational tapes must be changed. If the trunk has more than one mode of access, then the T5 record must also be changed. In the

manual/mechanized process, the file listing is simply a page copy of each of the various control tapes and cards administered by the center. The appropriate file listings are pulled from the file and changes are marked on these listings as indicated from the change record.

11.13 In order to change the tape or card file (the TMF) the appropriate tape or card deck is taken from the file and changes are entered. To update tapes, the recommended procedure is to duplicate the tapes with the duplicating process stopped at the appropriate points to enter or delete information. The tape thus produced becomes the new master tape. A second duplication or conversion is required to obtain a tape to send to the field. Two page copies are provided, one of which becomes the new master record and is returned to the file; the other is sent to the field.

11.14 To update cards, the change process for addition involves punching a new card with enough duplicates to update each of the affected card files as well as to provide cards to the field. Deletions require pulling cards from each of the affected file decks. A listing of cards to be removed is sent to the field as an indication to make appropriate deletions in local decks. In the center, a listing of a new master deck is made and returned to the master record file. Upon request, complete new decks and listings can be provided to the field.

11.15 The simplicity of the manual/mechanized procedure resides in the fact that the master file is always kept in order and that within the file there is one tape or deck for each of the test tapes or decks required. Although this involves a certain amount of duplication, the advantage is that the master file never requires sorting. Since both cards and tapes are perishable, a duplicate master file may be desirable. In the case of card decks which may be inadvertently shuffled, the duplicate deck can be used rather than require a sorting procedure which would be quite time consuming due to the difficulty of performing mechanized alphabetic sorting on the large common language field.

D. Flow Chart for a Process Using a Small Computer

11.16 Figure 51 illustrates a process using a small computer for tape preparation. The process of establishing pending CLR and Trunk Assignment files and sorting and coordinating pending changes is still a manual process as in Fig. 50. However, changes to the Trunk Maintenance file are entered on the simpler TMF Worksheets, Fig. 45, 46, and 47, Part 10, instead of the Tape or Card Preparation Worksheets. From these change records, a punched paper tape is prepared for each originating office. As the change records are read in, the computer performs simple edit checks. On a second pass through the computer, an updated file tape is prepared in common file format. Computer programs insert the change information into the new file tape automatically.

11.17 In order to prepare tapes for distribution to the field, the tape preparation program and test line table are loaded, the appropriate file tape is mounted, and the computer instructed to prepare a particular tape. The program reads the file information and puts it in the proper format to operate the test frame. Three tape files are required per office, one in each of the three sequences specified in Table 27, Part 10. The computer automatically selects the appropriate trunks from the file tape, inserts control characters and test line numbers, and produces the desired standard tape (eg, T1). The procedure for producing cards is identical except that the output medium is a card deck instead of a tape and, if desired, may include only cards that are added, changed, or deleted instead of the entire deck.

11.18 The main advantages of this process over the manual one is that change information need be entered only once to update all the tapes for an office, the data entry forms are easier to use, and simple editing and error checking is done automatically.

E. Flow Chart for a Process Using a Large Computer

11.19 For companies or areas with a large number of ATMS installations, the difficulty of handling a large tape library and of making multiple passes through the computer can be eliminated through

the use of a larger computer with random access mass storage. Figure 52 is an overall view of such a process. In concept, it is identical to the small computer process shown in Fig. 51. Its major advantage is that it eliminates the need for loading programs and mounting tapes and reduces the number of manual operations required to produce an updated set of tapes for an office. It also provides the opportunity for more complete edit checking and auditing procedures for the TMF.

F. Information Exchange Between Companies or Areas

11.20 Figure 53 illustrates the preferred arrangement for exchanging information between companies or areas within a company. The example shown is that of a 2-way trunk which is to be tested from either end. The trunk was designed by company or area A but terminates at the east end in a machine that is administered and maintained by company or area B. Note that the group responsible for trunk maintenance at the east end reports to company or area A. The procedure for providing cards or tapes at the east end is for the standard circuit layout card to be forwarded to the central circuit layout group in company or area B. This is copied and included with copies of other circuit layout cards that are to be forwarded to the Tape and Card Administration Center in company or area B. Circuit in-effect notices are passed through the same channels. The information needed to access the trunk is provided by the Traffic groups (shown to be located at the switching office locations) and cards or tapes are produced and distributed by company B to the company A trunk maintenance group at the company B switching office location.

11.21 One advantage of this arrangement is that, except for test line numbers which change infrequently, only circuit layout record cards need be exchanged between companies. Since standards for circuit layout record cards have been established in Section 682-000-011, intercompany exchange of information can then be on a standard basis. Secondly, Tape and Card Administration Centers only need to deal with traffic groups within their own companies. Since machine assignment records are not standard throughout the Bell System, this has the distinct advantage that nonstandard information need not be exchanged between companies. For example, if machine load and balance activity by a company or area B traffic organization affects the company A trunk, no information is exchanged between companies. A copy of the traffic order from the company or area B organization is simply forwarded to the company or area B Tape and Card Administration Center and the updated cards or tapes are distributed to the company A trunk maintenance group.

11.22 The obvious implication of this arrangement is that, in some cases, one company may be preparing cards or tapes for another company to use. It may be impractical in the beginning for various reasons to organize the centers in this manner. However, in the long run, it is expected that such an arrangement will be the most efficient for all concerned.

TABLE 29

TRUNK SCREENING TABLE
TRUNKS THAT CAN BE TESTED AUTOMATICALLY

TRAFFIC USE(8)		TRAFFIC CLASS(8)						
		FINAL		NON-ALT. ROUTE			HIGH USAGE	OTHER
CATEGORY	CODE	AF(1)	CF(1)	IF	DF(1)	FG	HU	TR
Intertoll	IT		X	X		X	X	X
Toll Connecting	CA				X(2)			
	DD	X(3)		X	X		X	
	OO				X(4)			
	TC				X		X	
	TM				X		X	
Interlocal	IA	X			X		X	
— Direct	IE				X		X	
	IM	X			X		X	
— Tandem	MT(3)	X		X	X		X	
	TG(5)				X		X	
	TO(3)	X		X	X		X	
Centrex	DI				X(6)			
	DO				X(7)			

Notes:

1. If No. 5 Crossbar originated, may require route-advance information.
2. If ANI equipped.
3. Some limitations on terminating ability —May require dummy test codes.
4. If machine accessible via auxiliary trunk circuits.
5. Must have access to the tandem end of the trunk.
6. If CU Centrex equipped with test lines.
7. If Centrex has testing ability.
8. See Section 005-200-100 for definitions of Traffic Class and Traffic Use.

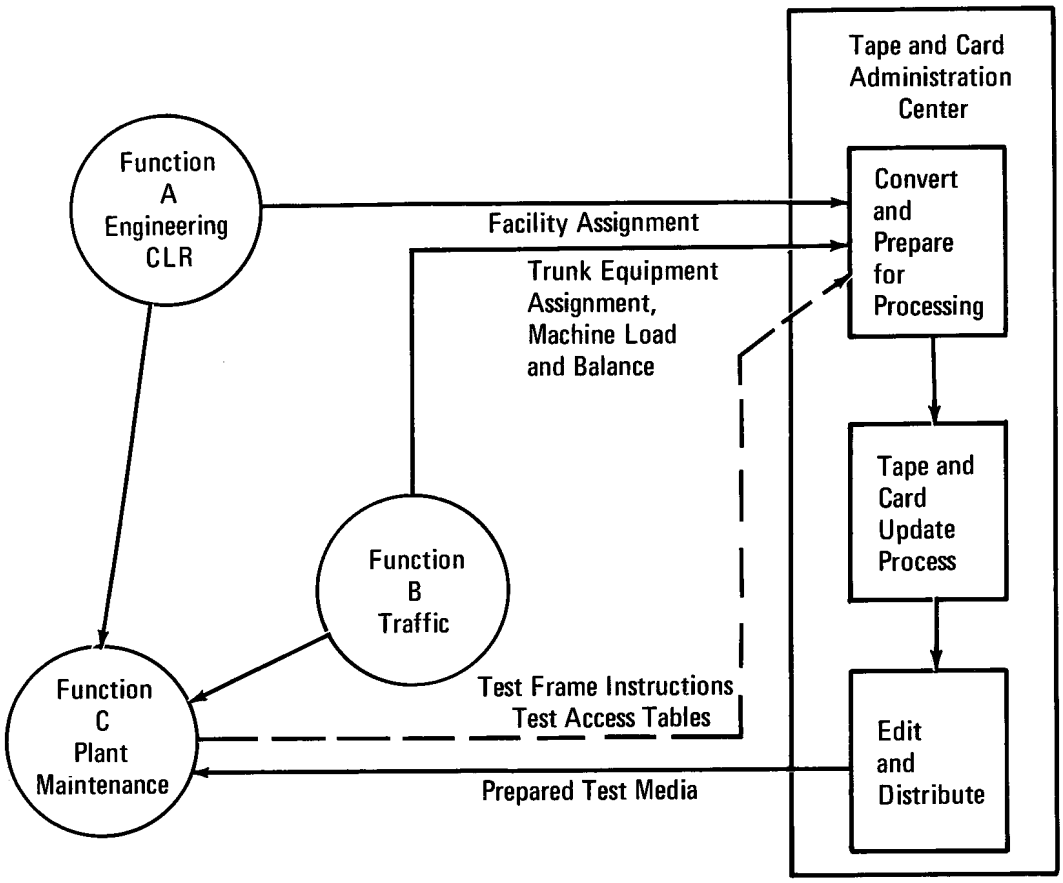
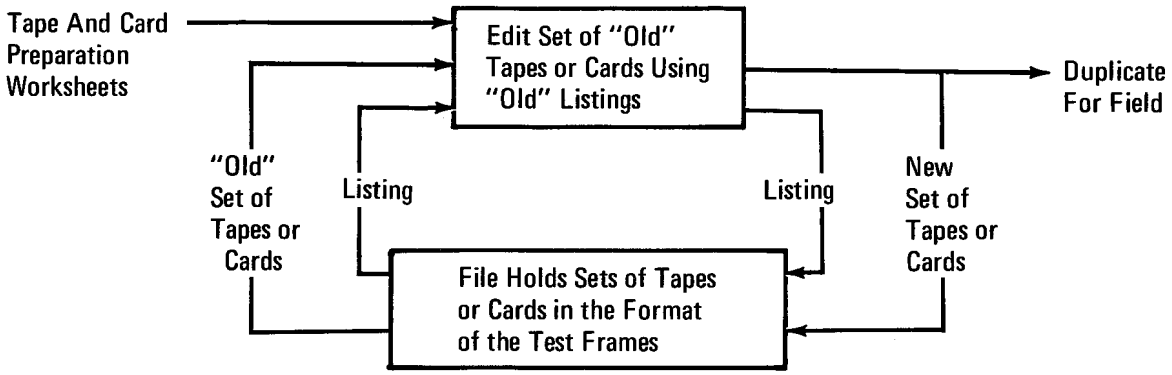
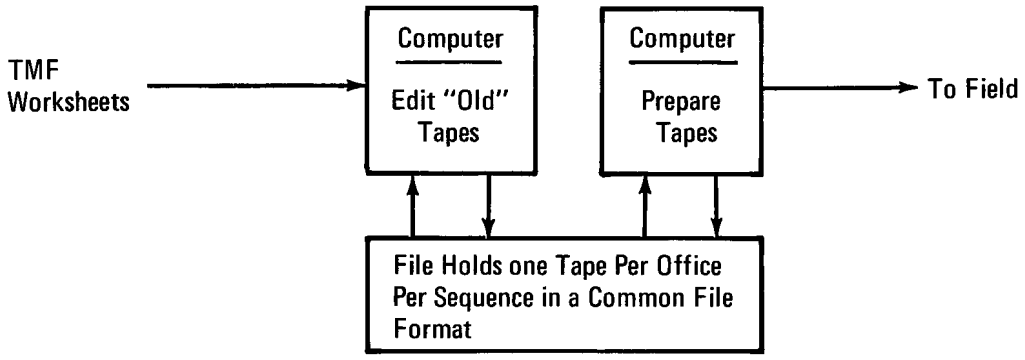


Fig. 48—Information Flow

Manual-Mechanized Preparation:



Automatic (Small Computer) Processing:



Automatic (Large Computer) Processing and Filing:

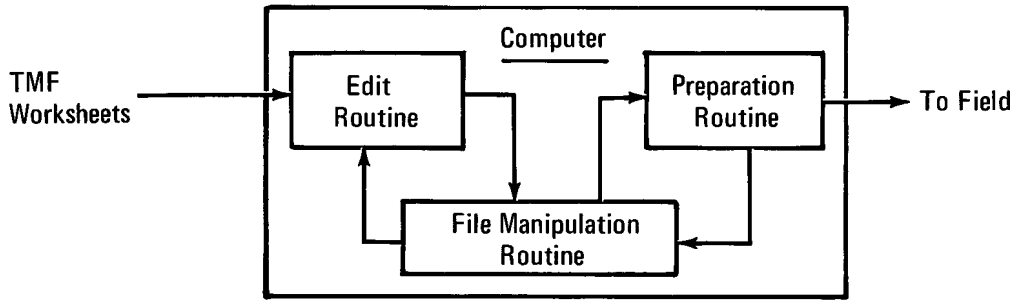


Fig. 49—Three Processes for Preparing Updated Tapes and Cards

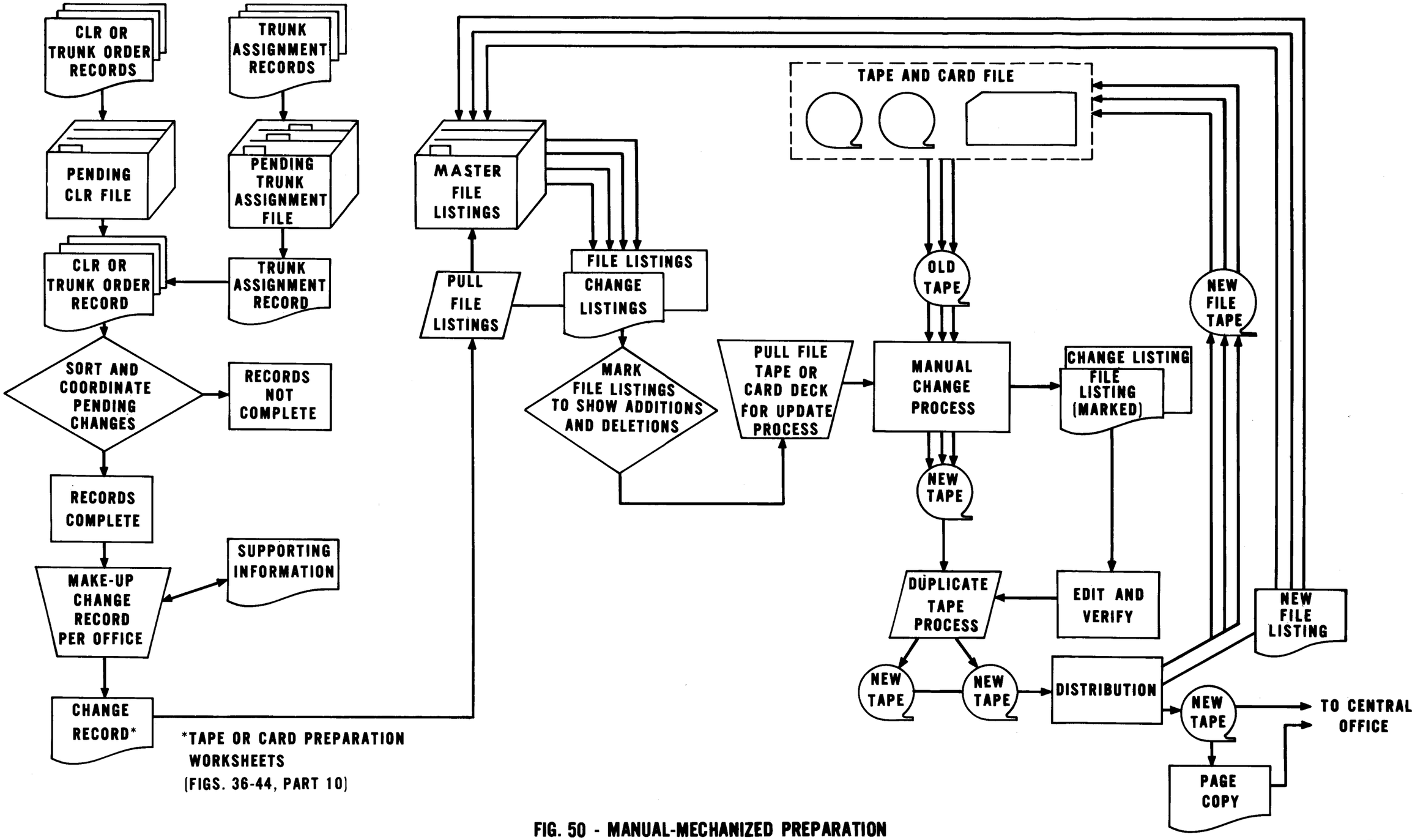


FIG. 50 - MANUAL-MECHANIZED PREPARATION

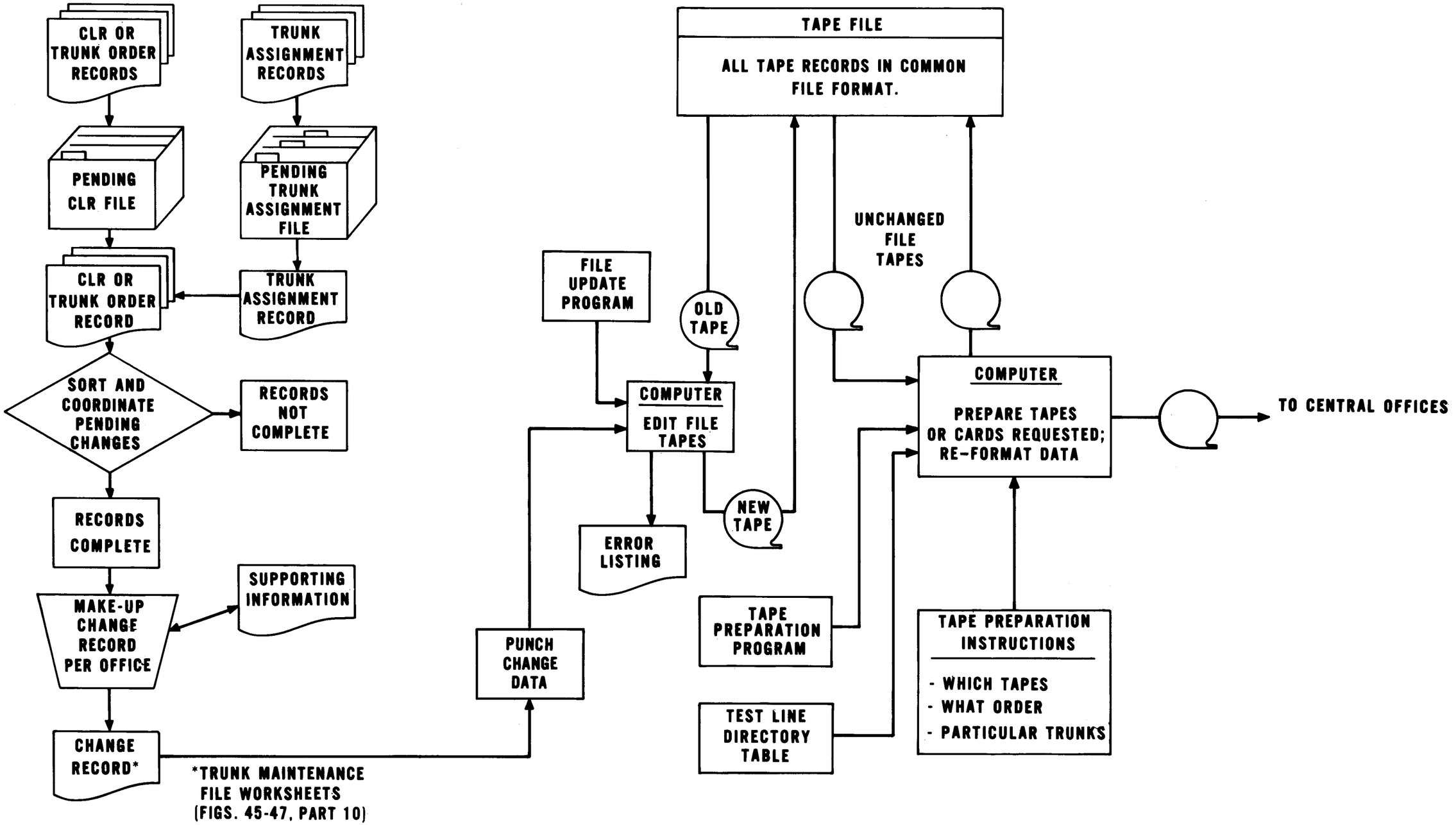


FIG. 51 - AUTOMATIC (SMALL COMPUTER) PROCESSING

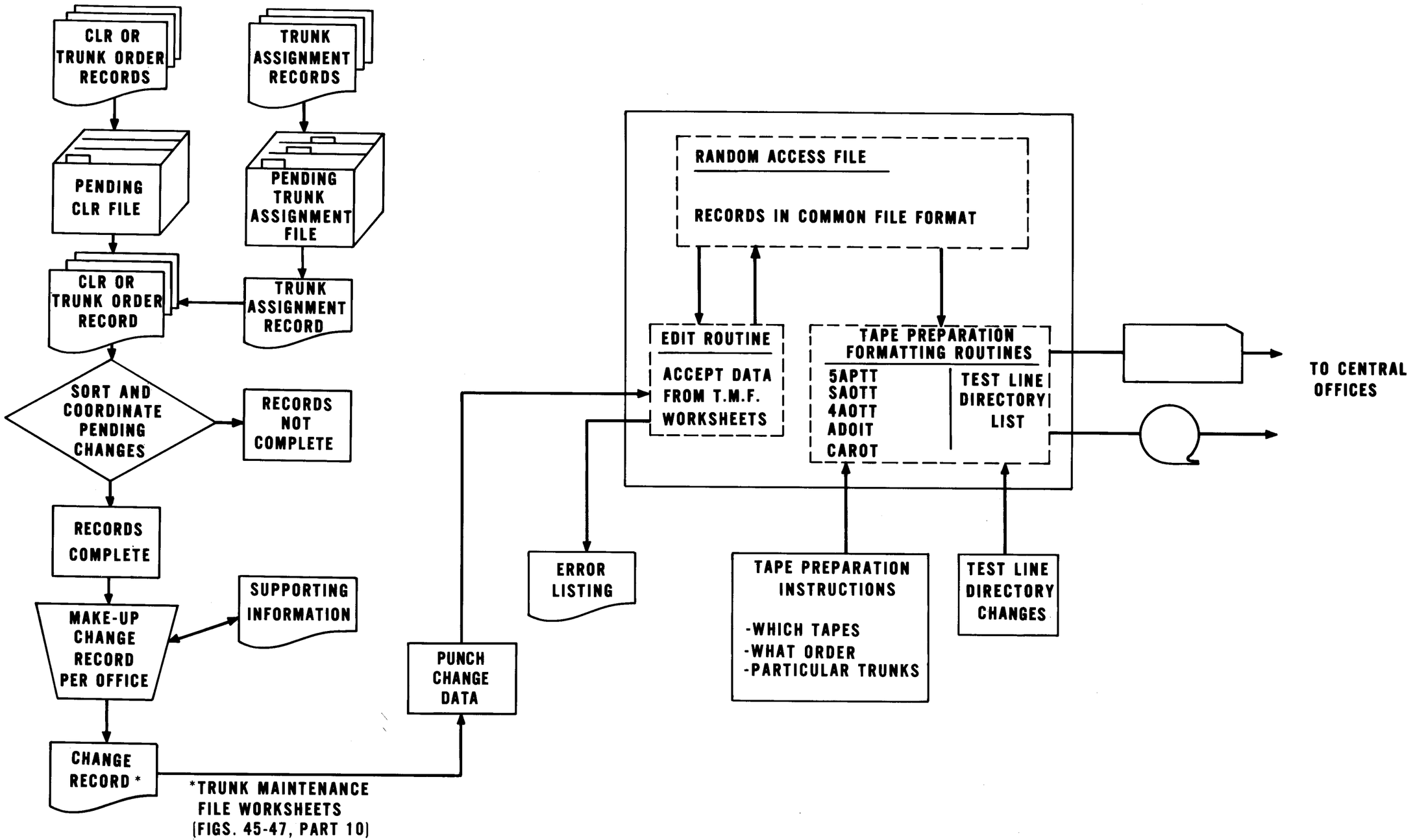


FIG. 52 - AUTOMATIC (LARGE COMPUTER) PROCESSING AND FILING

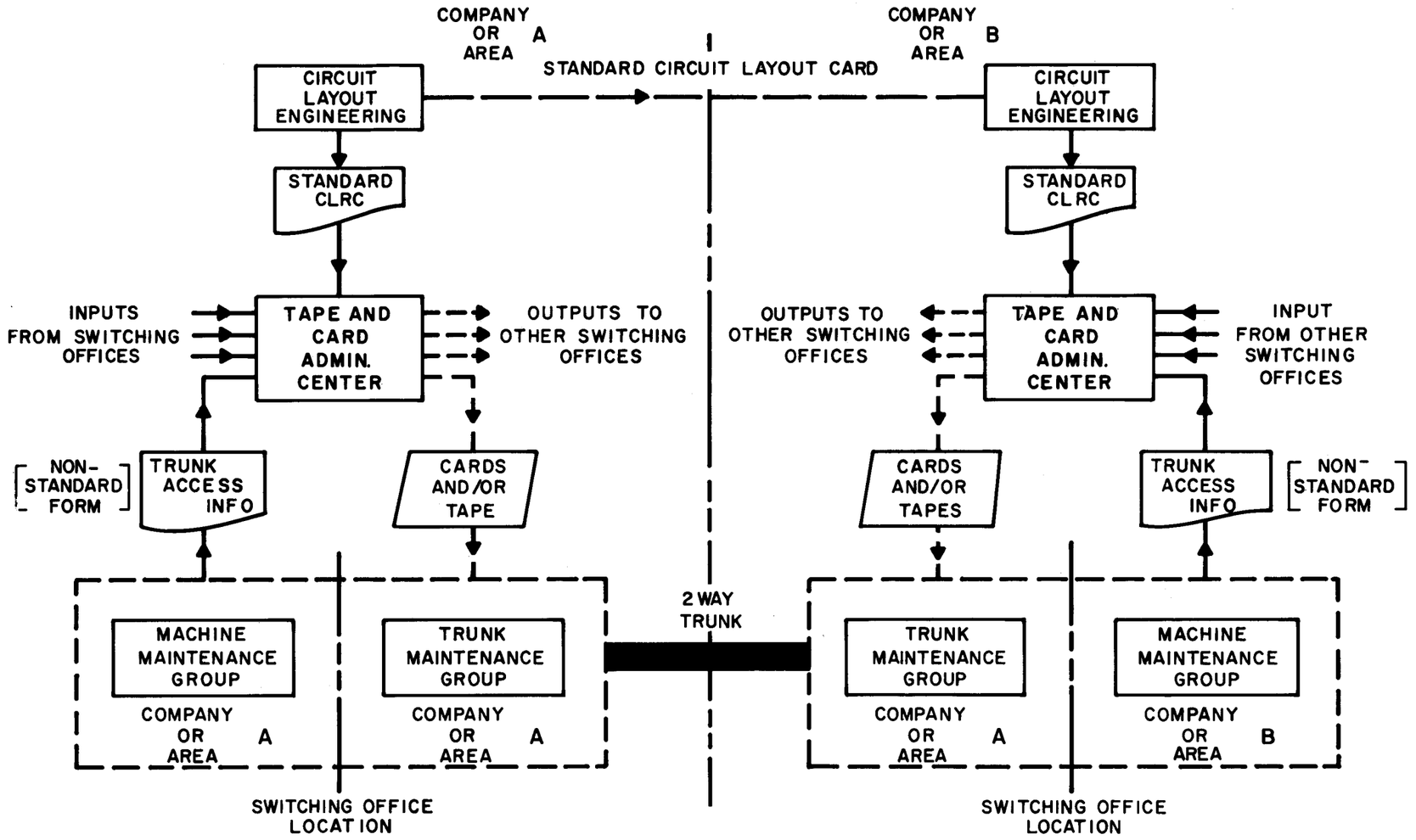


Fig. 53—Information Exchange

12. IDENTIFICATION AND DISTRIBUTION OF TAPES AND CARDS

12.01 To expedite the handling of tapes, it is desirable to have means by which a tape can be identified without having to run the tape through a teletypewriter to get a listing. Therefore, the 25 characters of the fixed part of the preamble should be put on the tape leader in readable form for tape identification. This can be done in one of three ways. First, a printing tape punch can be used. As the fixed part of the preamble if first on a tape, it would be the first printing after the tape leader. A second method is to write the preamble identification on the tape leader or on a label that is affixed to the tape leader. The third approach is to have the preamble information punched in the tape leader in the easily readable form shown in Fig. 54. This can be done by selecting the correct combination of holes to form block letters.

12.02 The punching of readable block letters can be easily implemented in an automatic tape preparation process that uses a computer program to output selected data to the tape punch to form the desired block letters. However, the punching of block letters also can be done quite easily on a 5-level manual punch using the key provided in Table 30 to construct the block letters. When such a tape is run through a teletypewriter, however, the block letters will produce a meaningless listing.

12.03 When preparing tapes by computer, similar 5-level block letters can be punched on an 8-level tape as shown in Fig. 54.

12.04 There is no identification problem for card decks as the first card in a deck will be the preamble card. The convention of using the preamble as the deck identification is most convenient.

A. Distribution By Data Transmission

12.05 If the information required to prepare the tapes and cards is contained and processed in a centrally located card and tape preparation center, some means is required to get the tapes or cards from the center to the test frame locations. The tapes and cards can be either physically transported or sent via data transmission. Following are guidelines for data transmission for those centers who wish to use this distribution technique.

12.06 5-Level Tapes Transmitted on the 5-Level TWX Network. A normal 5-level TWX arrangement can be used to transmit either a 5-level control tape or a test results tape. An identical tape will be punched at the receiving station, but the received page copy will not be correct. The following changes will occur:

(1) The page printer goes to the "letters" mode upon receiving a space. In a sequence of priming figures (upper-case characters) and spaces, the figures following the FIGURES SHIFT will be printed as figures, but after the first space the figures will be printed as letters (corresponding lower-case characters).

(2) If the receiving teletypewriter has upper-case type arrangement "A," in addition to the letters/figures substitution described in (1), a ")" will be printed in place of each "+" in test frame tape data.

(3) If the receiving teletypewriter has upper-case type arrangement "C" (which is the one commonly used in 5-level TWX), in addition to the letters/figures substitution described in (1), the following differences in upper-case characters will appear:

Test Frame TTY Page Copy	?	:	!	'	(	+	,	;	#
TWX Upper Case "C" Page Copy	5/8	1/8*	1/4	,	1/2	3/4	7/8**	3/8	***

*Some machines have Maltese cross.

**Some machines have /.

***No printed character.

12.07 8-Level Tapes Transmitted on the 8-Level TWX Network. A normal 8-level TWX arrangement can be used to transmit the content of an 8-level input or results tape for the No. 4 crossbar AOTT frame. The tape and page copy produced at the receiving station will both be correct. The EOT control character at the end of each AOTT frame tape will cause the teletypewriters to disconnect and shut off; therefore, the connection will have to be re-established if more than one tape is to be transmitted.

12.08 Other data transmission schemes for tape distribution such as those involving 8-level to 5-level conversion are not compatible with ATMS tapes. The ESS-ADF network is not usable for ATMS tape transmission because of conflicts between the control characters required by the network and those required by the test frames.

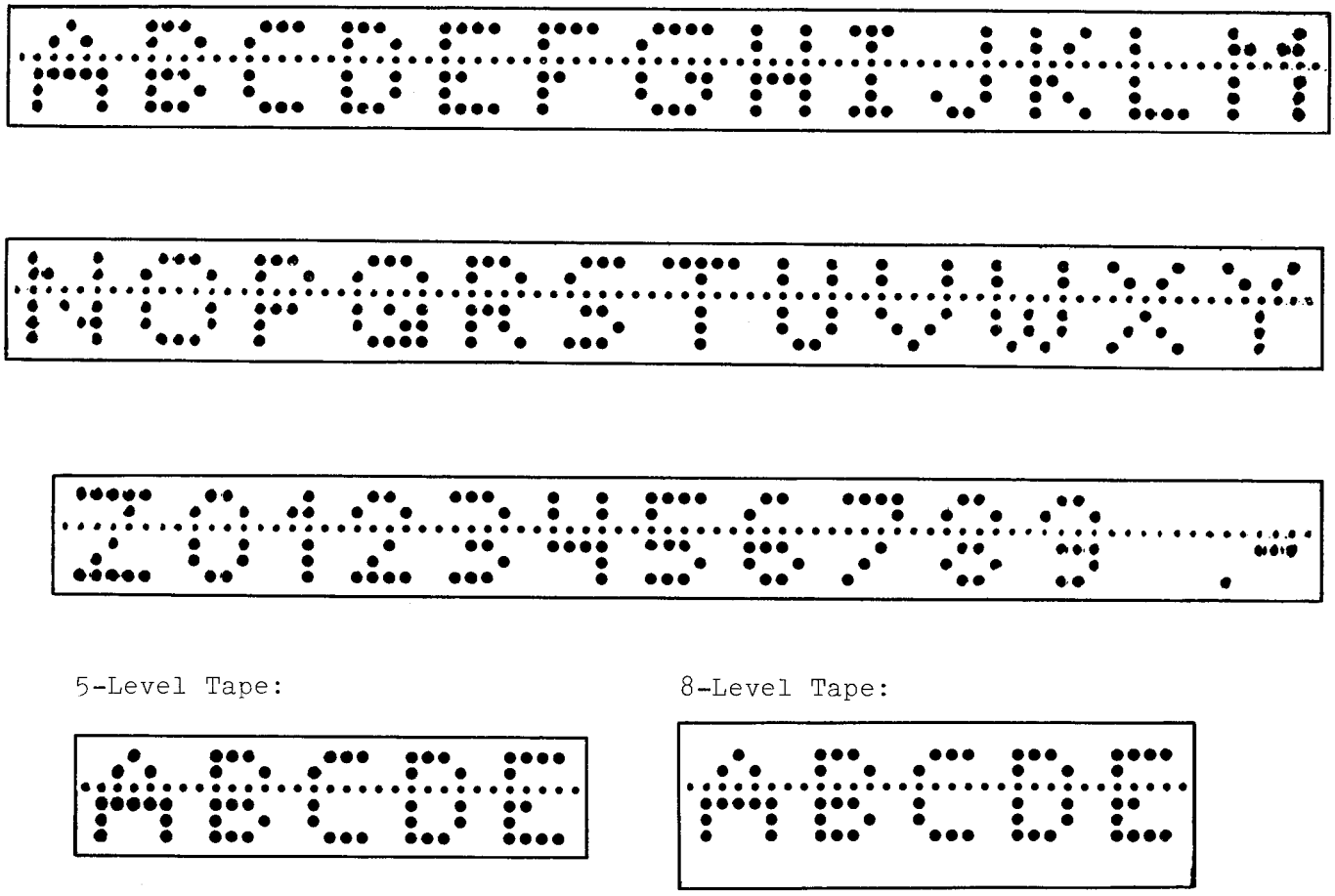


Fig. 54—The 39 Block Characters for Tape Identification