# D.D.D. SERVICE BUREAU

## 1.0 GENERAL

**1.01** This Section describes the structure, operating procedures and responsibilities of the *"DDD Service Bureau"*.

**1.02** DDD Service Bureaus are a focal point for collecting and analyzing DDD and local performance data.

**1.03** In *common control* areas and S x S areas with single completing train operation, DDD failures, D.S.A. reports and code 5, 7, and 8 reports can be merged to enlarge the data base. This assists in developing trouble patterns and performing TF (trouble found) and NTF (no trouble found) analysis to improve end link performance. Rearranging the data allows the analyzers to perform terminating and originating analysis, first link analysis and switchboard or TSPS analysis.

1.04    The Bureau is cautioned to be extremely accurate when analyzing input data so that any patterns or requests for work which are sent to the field are productive.

1.05    It is important for the field to be fully aware of Bureau methods, objectives and responsibilities. Visits by the field forces to the Bureau are suggested to promote this need for cooperation.

## 2.0    NUMBER AND LOCATION OF DDD SERVICE BUREAUS

2.01    Each Company via its DDD Steering Committee must survey its territory and determine the number of DDD Bureaus required, and their locations. The number of Bureaus are to be kept at a minimum consistent with the economical and efficient handling of operator reports and other data. There are decided advantages and economies to be realized by the concentration of skills and data processing arrangements in as few Bureaus as possible.

2.02    Some things to be considered when making these decisions are:

(1) Company and Area (single and multi-Area Companies) Corporate boundaries.

(2) Geography of operating area and NPA boundaries.

(3) Toll switching system layout including terminating switching areas and principle city routing.

(4) Traffic flow and homing arrangements.

(5) Volume of operator traffic in home NPA's.

(6) Number of traffic operating centers including trunk groups and sizes, trunk groups selected in multiple, and those machines selected.

(7) Long range TSPS program.

(8) Operator report volumes.

(9) Manual versus mechanized reporting.

(10) Data Processing arrangements in the territory.

(11) Ultimate expansion into multifunctional operations center. (See Section 010-401-010 Par. 2.03)

(12) Location of major switching machines (Class 1, 2, 3)

(13) Location of mechanized "Reorder Traps".

(14) Number of switchboards reporting.

**2.03** Most NPAs contain either Class 1, 2, or 3 toll switching machines, (called CSPs), several outward and inward operating locations (Class 4), and many end offices (Class 5). (See BSP 800-100-100, Section 3 for further definition.) Class 1, 2, or 3 offices are usually good candidates for the location of DDD Service Bureaus. Depending on routing arrangements and call volumes, one Bureau can do the trouble analysis job for all of the machines serving the NPA, and for adjacent NPAs which fall within the Company or Area corporate boundaries. (See attachments 1 and 2).

**2.04** Multiple Bureau operation may be justified where an NPA has one or more large population centers served by more than one Class 2 or 3 office, and traffic volumes produce enough data for analysis. The determining factors should be the amount of data available, the effectiveness of analysis by one Bureau or a multiple Bureau operation and the economy and concentration of skills offered by centralization.

**2.05** A "report receiving center" may be established at any Toll Center or CSP which has traffic patterns substantially different from those of the nearest Bureau. These centers simply take operator reports and conduct selective hold and trace trouble procedures. They are considered part of the prime area of the nearest Bureau.

## 3.0 PRIME AREA

**3.01** The *Prime Area* is that area for which the Bureau undertakes responsibility for detailed DDD analysis and for assistance to the field forces in locating DDD troubles.

**3.02** The prime area will encompass the designated NPAs and CSPs, all class 4 and 5 offices homing on those CSPs, and all inter-toll and toll connecting trunks associated with them.

## 4.0 PRIME AREA EXTENSION

**4.01** Some locations have little or no operator or customer *DDD traffic originating and terminating* in their own areas. In these cases it is advisable to request an adjacent Bureau to extend its Prime Area to include them. The Bureau receiving the operator reports then performs the analysis and holds and traces, as requested, into the extension of its Prime Area.

**4.02** When establishing "Prime Area Extensions" –

(1) Select a Bureau in the same NPA or same administrative area for better control.

(2) If it is necessary to go beyond the same NPA or Bureau administrative boundaries choose an adjacent high DDD volume NPA.

(3) Consider placing the entire NPA in the Prime Area extension. This eliminates the need for operators to route reports for different NNXs to different Bureaus.

(4) When the extensions remain in the same administrative boundaries, consideration should be given to the consolidation of Bureaus.

**4.03**  In areas which are largely common control or single train S X S, analysis of DSA and code 5, 7 and 8 reports can be done by the Plant Service Center. This will improve end link performance for both DDD and local traffic and eliminate the need for *requesting extension of a neighboring* Bureau's Prime Area.

## 5.0  HOURS OF OPERATION

**5.01**  Each Bureau must tailor its hours of operation to fit the territory it serves and to provide maximum operator reports for analysis.

**5.02**  Where DDD results and customer reports indicate a need for additional maintenance assistance, the Bureau should extend its hours to receive more operator reports. These reports can be taken selectively or in their entirety and recorded on recorders, punched cards, or some form of computer input as determined by the Bureau.

**5.03**  Consideration should be given to off hour Bureau operations during periods of special activity such as cutovers or annual major circuit order activity.

## 6.0  SIZE OF FORCE

**6.01**  It is important that the Bureau be staffed with adequate personnel who have necessary knowledge and skills to assure the effectiveness of the Bureau. Factors to be considered when determining *the number* of employees needed to operate an effective Bureau are —

(1)  The number of toll and switching centers in the Prime Area and any Prime Area Extensions.

(2)  Size of the Inter-toll network.

(3)  Volume of operator reports.

(4)  Amount of input data to be analyzed.

(5)  Method of receiving operator reports (live reporting versus mechanized).

(6)  Hours of operation.

(7)  Current failure rate.

(8)  D.S.A. analysis

**6.02**  Section 010-401-010 Attachment #1 shows the basic number of assignments in a fully operational DDD Service Bureau.

## 7.0  BUREAU CHIEF

**7.01**  The Bureau Chief is selected for his knowledge of switching machines and facilities, toll and local. His background should include line and staff assignments in switching or toll operations. The acceptance of the Bureau by the line forces will depend a great deal on the Bureau Chief.

**7.02** The Bureau Chief is responsible for the collection and arrangement of input data in orderly fashion for analysis. This requires close coordination with the Data Processing Center and with other groups furnishing input. He supervises and trains the Bureau personnel in methods of proper analysis and weak spot detection. His duties include the publishing of reports, Bureau results, and membership on various interdepartmental committees.

## 8.0 ANALYSIS PERSONNEL

**8.01** The personnel responsible for analysis and the preparation of patterns for trouble correction must have a range of skills which cover all types of switching and toll equipment in the Prime Area. They should be aware of such items as traffic routing patterns and call volumes, engineered capacities (machine and trunks), and have a general overall knowledge of the area maintenance arrangements.

**8.02** Analyzing personnel must accurately interpret input data and make practical decisions which result in a high rate of troubles found on the patterns issued.

**8.03** Personnel should be rotated in this assignment after a period of 18-24 months to spread the DDD knowledge acquired in the Bureau over wider areas.

## 9.0 CLERKS

**9.01** Bureau clerks should have knowledge of traffic operating procedures and clerical aptitudes. Where some form of mechanization has been established for receiving operator trouble reports, they may also require certain mechanical aptitudes. They may be required to operate sorters, key punch machines, printers, optical scanners, as well as TTY machines and recorders.

**9.02** The duties of the Bureau clerks will vary, depending upon the method of receiving operator trouble reports (verbal versus mechanized). If verbal reporting of trouble is used, the clerks receive the reports and advise the traffic operator of the disposition of the report. Where "hold and trace" trouble activity is warranted, the clerks will advise the operators and turn the trace over to designated personnel as directed locally. Other duties will include maintaining stroke records, preparing referral data, and general clerical operations.

## 10.0 QUARTERS AND EQUIPMENT

**10.01** The DDD Bureau should be located in quarters which are separated from equipment rooms, and where possible be adjacent to or have access to the General or Area Staff Groups of all Departments. This will eliminate the duplication of Plant, Engineering and Traffic practices. Any long range planning for space should include the space required for expansion of the Bureau into a "multifunctional operations center", as mentioned in Section 010-401-010, Paragraph 2.03.

**10.02** The environment of the Bureau quarters must be conducive to analysis work and should provide separate space for the DDD Service Bureau, the Network Trouble Analysis Supervisor, and a well equipped conference room. (Blackboards, easels, tape recorder, projection screen, etc.)

**10.03** The Network Trouble Analysis Supervisor is located adjacent to the DDD Bureau to allow him to devote his entire time to DDD maintenance improvement efforts.

**10.04** The provisions of adequate communications facilities is vital to successful Bureau operations. Basic requirements are a sufficient number of trouble reporting trunks to minimize Traffic reporting time, and proper outgoing facilities to permit the Bureau to conduct field contact work. Call directors with headset jacks are recommended as standard equipment if live operator reports are received.

**10.05** Equipment required for processing operator trouble reports is discussed in Section 010-401-013, however, when local conditions permit, arrangements should be made to have the DPC perform all data processing required for Bureau operations. This will allow all DDD personnel to devote full time to the trouble analysis job.

**10.06** Telephone answering sets can be provided for overflow of operator trouble reports, and extended hours of operation.

**10.07** Private lines to maintenance groups where high calling rates exist are recommended to insure prompt answering.

**10.08** Suitable portable service observing equipment and pulse analizers are required for the use of the DDD Task Force for performing detailed analysis and gathering of additional data.

**10.09** Magicall, or other semi-automatic test sets are required for selective call-thru testing. Dial tone sources as well as trunks terminating on the major switching machines must be provided along with means of inter-connection.

**10.10** Rapid communications with the field for transmittal of data require that a reproduction machine and a data phone be available in the Bureau.

**11.0 DDD SERVICE BUREAU DUTIES**

**11.01** The DDD Steering Committee determines the number, location, structure, etc. of Network Trouble Analysis Bureaus, and will outline any special duties not included in this BSP.

**11.02** A fully operational DDD Service Bureau has the following responsibilities.

(1) *Analysis of Service Observations*

One measurement of DDD performance is the proportion of ineffective call attempts assertained from Service Observing Data. The analysis of incoming trunk, out-going trunk and DDD Line observations provide plant trouble indications which can be significant as they occur or combined with other data to form trouble patterns. (See Section 010-401-017).

(2) *Receiving Operator and Customer Relayed DDD and DSA Trouble Reports*

The decision to receive local DSA reports along with DDD trouble reports is generally based on the local completing arrangements in the area (common control or S X S single train). Operator DDD reports represent the only media of major magnitude that give a current picture of

trouble conditions on the overall network. While customer trouble reports show that trouble conditions exist, they do not show how serious the trouble condition is since not all troubles encountered are reported by customers. Consequently, each trouble report is usually far more significant than just one report would indicate. Therefore, every effort must be made to obtain *maximum operator trouble reporting* on all failures on the intertoll, toll-completing, or local inter-office trunking. (Latter if local DSA reports are arranged for). The operator report represents a major source of professional and reliable trouble reporting. (See Section 010-401-013).

(3) *Connection Appraisal Survey*

Arrangements should be made with the Engineering department to forward to the Bureau all "Connection Appraisal" test calls which do not meet the loss and noise objectives. These are merged with the credit requests and/or operator reports of poor transmission and noise, thus providing an improved data base for analysis. Any failures to complete the test calls are also reported to the Bureau *as they occur.* These failures are similar to DDD Dial Line observations and provide additional data for analysis of originating failures *as* encountered by the customer.

(4) *Pre and Post Billing Credit Requests*

One of the objectives of good DDD service is to render a correct bill to the customer. From the Company viewpoint the value of a correct bill is also apparent since there is considerable expense involved in handling and clearing up cases of incorrect billing.

Since the requests for *pre-billing credit* must be made to the operator and ticketed by her, they can be reported to the Bureau as they are received and analyzed with other data.

The data can be made available from the Data Processing Center (DPC) during the billing process and can be provided to the Bureau in both originating and terminating listings by type of failure, such as wrong number reached, poor transmission, or cut off's.

The Wrong Number reports are computer matched against the billing file to cancel the message and its charge. The basis for the matching is the number the customer was trying to reach. The computer re-works the number making common dialing errors (such as transpositions) to locate the call to the wrong number. The same ticket, which produces the credit can also be a chargeable message if the operator places the subsequent call for the customer.

The analysis of *post-billing* complaints is done in conjunction with the Commercial Department. These complaints consist of "deny all knowledge" and "didn't answer" or "busy". The latter two are generally very short interval calls and involve minimum billing. The Bureau tape analysis team can request "to number" and "from number" scans from the billing tapes, and match the calls against the trunks handling short duration calls.

Typical problems detected are cases of improper supervision causing charge conditions on busy number and don't answer conditions.

(5) *Coordinate Selective Hold and Trace*

The Bureau conducts limited holding and tracing of operator reported plant troubles in its *Prime Area.* When the analyzer has been unable to correct a trouble condition with a pattern referral or the trouble is intermittent in nature, the selective tracing of operator encountered failures in the prime area is warranted.

Failures beyond the Prime Area are referred via a pattern transmittal to the distant Bureau which can then correct the troubles through analysis of its own data. If the troubles are not found through this procedure arrangements can be made to hold failures to assist them (See Section 010-401-015).

(6) *Selective Call-Thru Testing (Prime Area)*

The Bureau conducts selective call-thru testing on a limited basis, to assist in determining the condition or performance of a particular route or termination. When used in this fashion, every failure is of course held and traced.

Call-thru testing can be used to expand the quantity of calls to a given location to assist in locating an intermittent trouble not corrected by pattern analysis. One limited use of call-thru testing would be to place calls to a CDO while routine maintenance activity is taking place at a normally unmanned office. Call-thru testing beyond the Bureaus "Prime Area" is only done at the request of the distant Bureau.

Some very sophisticated call-thru test sets are available which do automatic calling and holding on failures, perform transmission tests to a limited degree, and also monitor supervision and flash. Since call-thru testing is done very selectively, and only in the Bureau's Prime Area, a creditable job can be accomplished with the use of an automatic dialer, (Magicall, etc.) Trunks from the major machines in the territory plus a dial tone source should be made available to the Bureau for inter-connection to the call-thru equipment as required.

Experience has shown that reports of transmission, noise and improper supervision can be readily *patterned by the Bureau and corrected by the field forces.*

The Bureau should review Central Office administration of the automatic test frames which perform transmission, noise and supervisory tests (ADOIT, APTT, AOIT etc.). Reports of test results, troubles found, hours of operation, out of service reports for the test frames and the terminations should be logged in the Bureau.

(7) *Supplementary Observing*

Supplementary service observing produces additional data to end offices to better determine performance levels and assist in analyzing trouble conditions. Excellent use can also be made of supplementary observing to substantiate to the machine supervisor of class 4 or higher switching machines that the failure rate of calls entering the machine exceed those leaving the machine, thus indicating call blocking situations in the machine itself.

When supplementary observing is required the Traffic member of the Task Force will contact the service observing group to make the necessary arrangements. Standard reporting forms are returned to the Bureau for analysis.

If supplementary observing is required in Independent Company territory the Independent Relations man on the DDD Task Force can make the necessary arrangements. Trained observers should be provided by the Independent Company when possible.

(8) *Operator Encountered Reorders*

An operator encountering a reorder signal is instructed to mark the "RO" bubble on the operator mark sense ticket. During the billing process these reorders are collected and printouts are prepared which arrange the reorders in originating and terminating order.

Analysis of operator-encountered reorders provides information which can be compared to trunk usage data to establish priorities for completion of toll circuit order work. It is also used to locate and correct machine blockages due to lack of channels in common control type offices and inter-selector blockages in SXS.

With removal of "flash" the operator report of reorder is an excellent source for reorder data toward the end links. Traffic Operating Practice, Division G, Section 10 covers the procedures for reporting of operator encountered reorders. Further information on analysis of operator encountered reorders is found in Section 010-401-018.

(9) *Mechanized Reorder Trap Analysis — #4XB, XBT, and #5XB*

In #4XB and XBT Toll Switching Offices, the volumes of reorders encountered have made it practical to provide the offices with fully mechanized reorder traps. All reorders encountered are reproduced on an IBM card through the use of an IBM Summary card punch. Depending upon the location of the card punch (See Section 010-401-018) either the Bureau or other forces can rapidly identify trunk failures by sorting these cards.

RO trap cards are forwarded daily or weekly to the Data Processing Center to provide more detailed listings for analysis. This analysis can be performed by the Bureau and the Traffic machine administration people.

#5XB traps are not mechanized and analysis of trouble reorder cards can be time consuming. The Bureau should request that the trap be scheduled to be run during busy hours and assist the field with the analysis.

(10) *Billing Tape Analysis*

The DDD objective of "Billing — 100% Accurate — Nothing Less" is generally considered to refer primarily to the correctness of the subscriber's bill. However, the ability to bill for *every* revenue producing completed message was also intended.

A review of the "Selected AMA Statistical Data" found in the "Interdepartmental Billing Service Results" publication shows that considerable revenues are lost due to the cancellations of charges, both initial and overtime. While some losses are generated during the processing of the billing tapes, the major portions of the cancellations are due to billing equipment malfunctions.

With the introduction of C.R.B. (Customer Records and Billing — See Comptrollers Letter M-284) which is the preparation of the customers bill via the use of magnetically stored data, considerable information can be made available which can be used by trained analyzers in the Bureau to effectively reduce the number of cancel charge messages.

The data becomes available during the Electronic Data Processing (EDP) of magnetic tapes which are converted from perforated paper tapes generated by AMA calls in CAMA and LAMA offices. (See Attachment #4). Attachment #5 shows some reports which are produced and the types of troubles which the Bureau analyzer refers to the Central Office for correction.

The results of detailed analysis is easily tracked by trending the failures which are summarized daily on the "Central Office Error Record", and attaching average dollar value to each type of call (intrastate, interstate and overtime on each) to determine amounts of revenue losses which have been *corrected.*

The recovery of idle trunks and the use of the data in cases of fraud (coordination with the Security Group is required) are other uses which result from active tape analysis efforts.

Centralizing the tape analysis operation and performing the investigations with a trained group under the control of the DDD Bureau will improve billing results and control revenue losses. The advantages of centralized investigation are:

A. Less delay in discovering irregularities.

B. Better control of equipment malfunctions.

C. Fewer messages not billed.

D. More significant error patterns.

E. Greater dissemination of productive trouble locating techniques.

F. Quicker detection of fraud.

(11) *Analyze 555-1212 Data*

555-1212 is the universal directory assistance number used by customers who need numbers in foreign numbering plan areas. The call is a non-charge call. If a charge entry is detected on the tape during the billing process, the call is considered an "Unmatched Message" since the master rate records do not contain any rating information to that termination. (See Item (12) Analysis of Unmatched Messages).

The DPC produces a printout monthly or at a frequency determined jointly by the DPC and DDD Bureau listing the failures. These failures can be caused by several conditions —

A. Equipment trouble

B. Fraudulent use (Refer to Security Group)

(12) *Analysis of Unmatched Messages*

The unmatched messages are records of messages that are "Unmatched" in the rating operation.

The toll message and the rate records are matched by area code and the terminating central office prefix, and those for which there are no rate records are rejected as "unmatched." These unmatched messages are classified in the following categories:

A. Prefix changes (not up-dated)

B. Plant test calls.

C. Reaching operator (unblocked T.C. code)

D. Wiring errors

E. Local or extended area calls not blocked.

F. Wrong code patterns,

G. Prefix not in DDD guide.

H. Straddle ticket errors

I. Customer misuse

J. Fraud

L. POTS to TWX

M. TWX to POTS

N. NPA – NNX – 0000 rejects

Upon receipt of the "unmatched message" records the analyzer reviews the messages in the various failure categories and compares them to previous months records to determine equipment problems, record errors, customer irregularities and suspected fraud cases. A check of the unmatched record statistics will disclose the quantity of unmatched messages which are rejected and thus the degree of involvement required. Large volumes indicate not only revenue losses but unnecessary processing by the DPC, and repeated attempts on the network.

Throughout the entire billing process, the message data is continually edited. When incomplete data or invalid conditions are encountered, error records are produced and the message is rejected from the flow for analysis and correction. These errors, in addition to the unmatched message record (no valid terminating point) and 555-1212 data, can include the following:

A. Call made before service order connect date.

B. Call made after service order disconnect date.

C. No account on file.

D. AMA call terminating at a SMU or MMU point and recorded as toll.

E. TWX call – account not TWX.

F. AMA call terminating at a SMU point and recorded as MMU.

G. AMA call terminating at a toll point and recorded as MMU.

All of the preceding are caused by service order discrepancies or by wiring or cross-connect errors in

    A. Markers

    B. Line Link Frames

    C. Transverters

    D. Billing Indexers

    E. Senders

    F. Number Networks

    G. Translators

They represent pre-billing errors and trouble should be found on every investigation.

#### (13) *Inwats, Outwats, Data and International Dialing Trouble Reports*

Customer and operator encountered troubles in the above categories are referred to the DDD Bureau or Data Service Bureau as instructed locally, where they are associated with other data for analysis. When sufficient volumes of reports exist, consideration can be given to a mechanized program which can produce a print-out arranged in originating and terminating order by type of failure. Since the user of these services generally represents a customer who relies heavily upon them, prompt attention must be given to their analysis. Each Bureau receives a report from St. Louis monthly listing all Inwats failures which are the results of a one week sample of operators requesting conversion numbers from the Inwats assistance operator. These are analyzed for proper translations in the serving machines. See Section 010-401-013 for instructions on trouble reporting.

#### (14) *Improper Supervision*

Improper trunk supervisory signals are generally considered to be the result of malfunctioning equipment. However, they could be the result of fraudulent use of telephone service. All cases of irregular or unusual supervisory signals are investigated by the DDD Bureau. Cases of improper supervision encountered by operators or observers are reported to the DDD Bureau as arranged for locally. In addition to recording these reports and merging them with other data, a separate printout will be provided so the details and disposition of the reports can be forwarded to the Security Department. Good judgment and discretion is mandatory in the handling of these reports, and *no effort* should be made by Bureau personnel to contact the calling or called party.

Calls to Free Line Service (FLS) numbers will appear to an operator or observer as improper supervision. The Bureau should have access to all authorized FLS numbers in its territory, and contact other Bureaus for verification of *repeated reports* of improper supervision in their territory.

The extent of investigative effort must be adequate, but tempered with good judgment. One report of improper supervision that involves a large trunk group does not necessarily justify a

special test of that trunk group. The same applies to extensive testing of trunks to an end office. A definite pattern pointing to a trunk group or distant office should, however, result in thorough testing.

(15) *Exchange of Data With Other Bureaus*

Each Bureau assembles data which allows it to analyze the "inter-toll" and "end link" performance in its own Prime Area and Prime Area Extensions. Data is also assembled for adjacent and non-adjacent high volume calling areas. This information is exchanged with *adjacent* Bureaus on a *regular* basis and with other Bureaus as *requested* or as *performance indicates.*

It is important that the data be exchanged as quickly as possible so that it can be merged with the Bureaus results for pattern analysis. Where delays are unavoidable due to differences in processing dates, it may be productive to compare data of coincident intervals, or to merge the data with newer data to determine if performance has improved.

The format of the data exchanged will generally differ between Bureaus until all Bureaus adopt standard Formats. However there is sufficient uniformity in "Bureau language" and "recording of information" to make the conversion if an explanation accompanies the information.

Data and pattern transmittals are mailed to the Bureau serving the NPA involved as indicated in the DDD Bureau Directory. Where a *pattern* is analyzed to an adjacent area and a reply is expected, 3 copies of a "Network Service Improvement" form are prepared and two copies forwarded. Upon completion of investigation one copy is returned to sender. (See Attachment #6, Exhibit 1 and 2.)

An extra copy of attachment #6 has been provided which can be reproduced locally to standardize the transmittal of information between Bureaus.

(16) *Identification of ANI Errors (4A — XBT — 5XB)*

Failure to identify the calling party on toll and multi-message unit calls causes the call to be routed to an operator for identification. The CAMA equipment associated with operator identification is equipped with a "identification failure" trap, which when activated produces a trouble record. #4XB and XBT have a standard trap available which produces a trouble recorder card, and an IBM card similar to the RO trap. The IBM card can be processed to aid in reducing identification errors. Analysis of ANI failures by central office forces in other offices is time consuming since the trap is not mechanized. However DDD Bureaus are in a position to do this analysis because they are equipped to convert information into records which can be sorted and summarized. The trap is run under control of the Bureau which will determine the availability of clerical and DPC machine time and do the pattern analysis. The troubles will generally fall into three categories:

A. Station equipment

B. Number networks or translators

C. Out-pulsers or registration trouble

Accurate records must be kept on failures to determine the need for activating the trap.

Locations having TSPS operation can arrange to have the operators report ANI failures to the DDD Bureau using standard trouble report codes reserved for local company use.

Unreasonable levels of ANI failures cause excessive holding time at both local and CAMA offices, a need for additional operators at CAMA switchboards, failure to utilize our investment in ANI equipment, and customer dissatisfaction.

(17) *Collection and Integration of Data*

The Steering Committee, having determined the range of operations of the DDD Bureau, delegates to the Bureau the responsibility for the *collection* and *integration of all trouble data.*

The Bureau along with the DPC member of the Task Force and other members as required, will determine the data collection, assembly, and listing procedures which are to be used, and prepare a job definition for the approval of the Steering Committee.

Once input and output procedures have been determined and formats generalized, consideration can be given to the integration of various inputs into a consolidated listing to be used for *pattern analysis.*

Although limited analysis can be performed as the trouble reports are received, the volumes should be sufficiently large to allow patterns to be formed with reasonable assurance (50-70 percent) of locating trouble. The integration of data from sources such as —

    A. Employee Reports

    B. Operator reports (All types)

    C. Customer Reports

    D. Service Observing

    E. Data from other Bureaus

    F. Data from area Network Service Centers (Longlines)

Local volumes will also determine how long all reports should be accumulated before being discarded. A four week rolling accumulation with a listing provided weekly for analysis can also be used to determine the effect of found troubles. (Did it disappear?)

DDD Service Bureau activity should be maintained on a calendar month basis.

(18) *Major Problem Report*

The DDD Service Bureau is responsible for identifing the conditions contributing to large numbers of trouble reports. As problems are identified, the Bureau refers them to the proper group for correction using a pattern transmittal form. For various reasons, some problems may not be fixed immediately. If regular referral procedures are unable to prompt a reply or to clear the trouble, the Bureau issues a MAJOR PROBLEM REPORT to inform higher management of the problem.

"Major Problem" reports are issued by the Bureau from information accumulated in the Bureau, and previous Pattern Referrals.

"Network Maintenance Service Improvement" form Attachment #6 Exhibit 1 and 2 can be used to transmit the "Major Problem" report.

(19) *Service Bureau Activity Summary*

Each Bureau will maintain detailed records of its activities to aid in determining where its efforts are most productive, and to allow it to trend trouble types and class, and their disposition.

A less detailed report is required to keep management informed of the various activities. An example of such a report is shown in Attachment #7. The Bureau should maintain the suggested format for System comparison purposes, but local additions may be made.

(20) *Abnormal Plant Conditions*

All major service affecting failures are reported to the Bureau and posted on the status board and logged on a special log. (See Attachment #8).

Upon receiving the report the Bureau will stop all activity which might further jeopardize service, and the analyzers will make note of the date and time of failure when building patterns.

(21) *Summary of Work Errors*

Troubles which are found while holding and tracing or on trouble patterns are classified and a written record is made by the field forces according to the CM Plan. Those due to "man made" conditions are also summarized by the Bureau and reviewed with the "Work Error" coordinator. All unreasonable levels of man-made troubles are reviewed by the Steering Committee and discussed with the responsible department i.e. Western Electric Co., Long Lines, Plant Maintenance Forces. (Associated and Independent Company)

(22) *Administrative Report*

The DDD Bureau is responsible for keeping all levels of management informed about its results, departmental participation, problem areas, and other information on Service Bureau activities. The report should contain only information pertinent to the people receiving it. The Bureau should guard against making the report too voluminous or difficult to interpret. The report should include the following items

A. Service Bureau Activity Summary

B. Major Service Affecting Failures

C. Work Error Summary

It should also include its activities in relation to:

A. Incoming Service Observing Results

B. Outgoing Service Observing Results

C. DDD Dial Line Results

D. SAM (DDD Results)

E. Operator Reorder Summary

F. AMA Tape Completion Report

G. Ineffective Machine Attempts Summary

Weak areas for each item on the "Administration Report" are identified, and plans for corrective action must be stated.

(23) *Analysis of AMA Tape — % Completion Study*

Arrangements are made with the DPC to furnish % completion studies for all recorder groups on a given day in each month. Analysis of this data by the Bureau will furnish a comparison of its out-trunk performance to a given location with that of others and vice-versa. Both originating and terminating problems can be analyzed and trended with other data such as incoming and outgoing trunk performance and can be used to pattern trunk group, recorder group, and end link troubles. Where all groups but one complete at an acceptable rate to a particular location, analysis on the originating end, may point to originating type troubles.

(24) *Special Analysis of New Switching Offices (Toll and Local)*

Effective with the cut-over of a new switching office, the DDD Bureau concentrates its trouble analysis efforts on that office. All resources of the Bureau are made available to assist the field forces. If special summaries are required, arrangements are made with the DPC.

# SWITCHING PLAN

## (Routing Pattern)



CSP'S
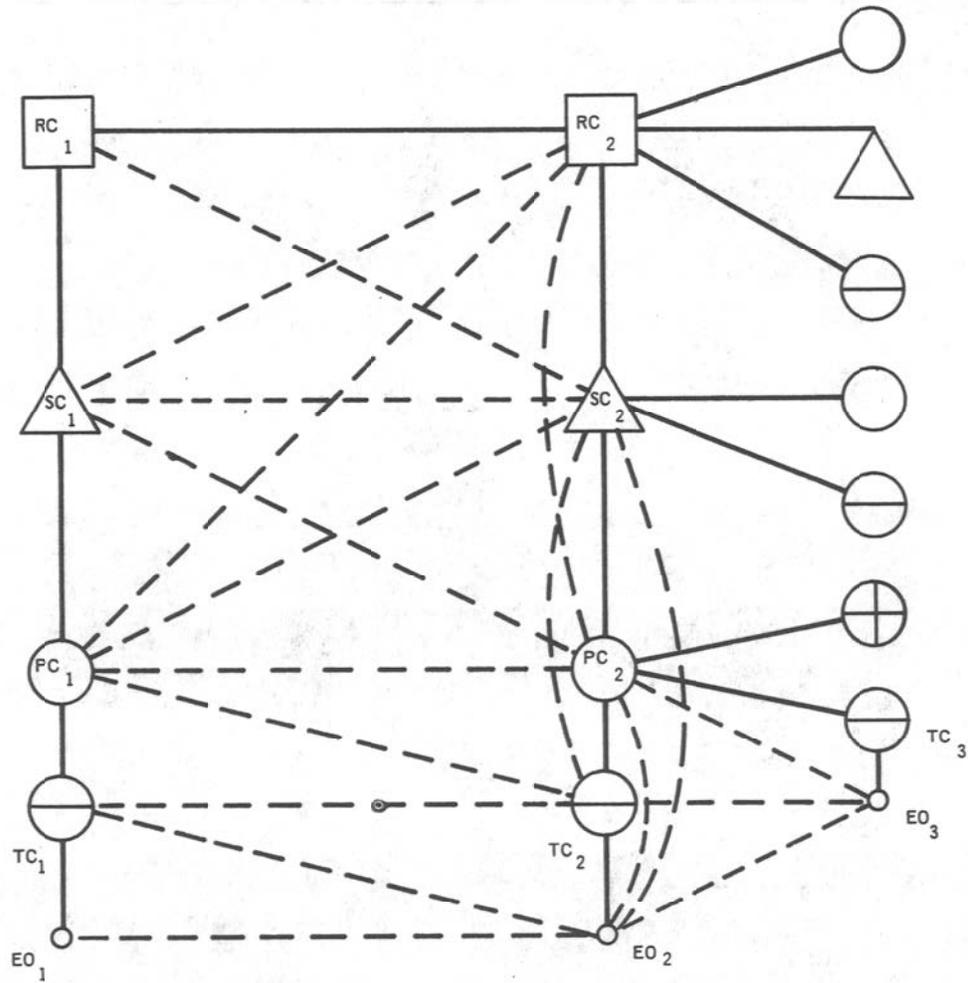
| Symbol | Description |
|--------|-------------|
| □ | RC – Class 1 Regional Center |
| △ | SC – Class 2 Sectional Center |
| ◯ | PC – Class 3 Primary Center |
| ◯ | TC – Class 4C Toll Center |
| ◯ | TP – Class 4P Toll Point |
| ○ | EO – Class 5 End Office |
| ——— | Final Group |
| – – – | Possible High Usage Group |

Note:

An HU trunk group may be established between any two offices, regardless of location or rank, whenever the traffic volume justifies.

# SWITCHING PLAN

## (Basic Principle)

Class 4P
(TP)

CLASS 3
(PC)

CLASS 4C
(TC)

CLASS 2
(SC)

CLASS 1
(Regional)
(Center)

CLASS 1
(RC)

CLASS 5
(End Office)

CLASS 2
(SC)

CLASS 5
(End)
(Offiec)

CLASS 4C
(Toll)
(Center)

CLASS 5
(End)
(Office)

CLASS 5
(EO)

CLASS 4C
(TC)

CLASS 3
(PC)

CLASS 2
(Sectional)
(Center)

CLASS 4P
(TP)

CLASS 2
(SC)

CLASS 3
(PC)

CLASS 4P
(Toll)
(Point)

CLASS 5
(End)
(Office)

CLASS 3
(Primary)
(Center)

CLASS 4C
(TC)

CLASS 4C
(TC)

CLASS 4P
(TP)

CLASS 5
(EO)

CLASS 5
(EO)

CLASS 5
(EO)

CLASS 5
(EO)

| Symbol | Class | Name | Abbreviation |
|--------|-------|------|--------------|
| ▢ | 1 | Regional Center | RC |
| △ | 2 | Sectional Center | SC |
| ◯ | 3 | Primary Center | PC |
| ⊖ | 4C | Toll Center | TC |
| ⊕ | 4P | Toll Point | TP |
| ○ | 5 | End Office | EO |
| — | Final | Trunk Group | |

# EDP MEDIA FLOW



C.O. AMA PAPER TAPE → PAPER TAPE TO MAG TAPE CONVERSION → 7 TO 9 TRACK TAPE CONVERSION → AMA ASSEMBLY STATISTICS & ANALYSIS → BUREAU REPORTS → REPORTS

PAPER TAPE TO MAG TAPE CONVERSION → C.O. TRANSMITTAL & TROUBLE REFFERALS

AMA ASSEMBLY STATISTICS & ANALYSIS → TWX OBSERVED & LOCAL / UNRATED TOLL / STATISTICS

Reports branch:
- DAILY STRADDLE REPORT
- DAILY DETAIL REPORT OF FAILURES
- DAILY SUMMARY REPORT OF FAILURES
- DAILY IDLE TRUNK REPORT
- DAILY TAPE ANALYSIS TRUNK EXCEPTION REPORT
- AS REQUIRED TAPE ANALYSIS SPECIAL REPORTS NOTE 1

REFFERALS TO CENTRAL OFFICES ← FOUR INTERIM SUMMARY REPORT OF TAPE FAILURES 4 HOUR-INTERIM TREND

**NOTE 1**

ASSEMBLED CALL
VERBATIM
NPA LIST
NPA LIST PER HOUR
TRUNK SCAN
FROM NUMBER SCAN
TO NPA SCAN
TO CENTRAL OFFICE SCAN
TO NUMBER SCAN
TRUNK USAGE NO EXCEPTIONS

```
                        ┌─────────────────┐
                        │     REPORTS     │
                        │      FROM       │
                        │  AMA ASSEMBLY   │
                        └────────┬────────┘
                                 │
┌──────────────┬─────────────────┴──┬──────────────┬──────────────┐
│ DETAIL &     │                    │   TRUNK      │ OTHER SPCEIAL│
│ SUMMARY      │   IDLE TRUNK       │ EXCEPTION    │ TAPE ANALYSIS│
│ REPORT OF    │   REPORT           │  REPORT      │   REPORT     │
│ FAILURES     │                    │              │              │
└──────────────┴────────┬───────────┴──────────────┴──────────────┘
                        │
                ┌───────┴─────────┐
                │  AMA ANALYZER   │
                └───────┬─────────┘
```

**DETAIL & SUMMARY REPORT OF FAILURES** | **IDLE TRUNK REPORT** | **TRUNK EXCEPTION REPORT** | **OTHER SPCEIAL TAPE ANALYSIS REPORT**

**AMA ANALYZER**

**NOTIFICATION TO C.O. OF TAPE ERRORS**

TRANS. NON-SYNC.
EXTRA "O" LINES
TRD
STL
ETL
MUT "O" LINE
MUT 1 OR 3 LINE
MUT 2 LINE
MUT 28 LINE
MUT UNIDENTIFIED
BLANK LINE
285400 (CHG. GUARD)
285600 (NON-SYNC.)
285700 (TRANS. NON-SYNC.)
2857000 (CANCEL "O" LINE)
287100 (CANCEL "1" LINE)
287200 (CANCEL "2" LINE)
281899 (MUTILATED HOUR)
281999 (MISSING HOUR)
TRO. PER 1000 CALLS
CANCEL CHG. CASES
CANCEL CHG. MSGS.
CANCEL OVT. CASES
CANCEL OVT. MSGS.

**NOTIFICATION TO C.O. OF TRUNK TROUBLES**

NO USAGE
LOW COMPLETION (40% OR LESS)
HIGH COMPLETION (91% OR MORE)
SINGLE TIME LINES
TIMED RELEASE DISC.
.2 MIN CALLS
1 MIN CALLS
AVE. USAGE TIME
TOTAL USAGE TIME

## NETWORK SERVICE IMPROVEMENT

DATE _____     CASE NUMBER _____

☐ INTRA-COMPANY TRANSMITTAL

☐ INTER-COMPANY TRANSMITTAL

☐ MAJOR PROBLEM|TRANSMITTAL

☐ REPLY REQUESTED – REPLY BY _____

TO _____     INFORMATION COPIES TO _____

_____     _____

_____     _____

_____     _____

_____     _____

ANALYSIS OF _____

PROVIDED THE FOLLOWING PATTERN _____

_____

_____

_____

_____

ISSUED BY _____     RETURN TO _____

TELEPHONE NO _____     _____

ATTACHMENTS – ☐     _____

_____     _____

ACTION TAKEN-TROUBLE FOUND _____

_____

_____

_____

DATE & TIME CLEARED          ☐ FOUND BEFORE RECEIPT OF PATTERN

_____     _____
                              SIGNED          TITLE

## NETWORK SERVICE IMPROVEMENT

DATE __July 11, 1970__   CASE NUMBER ___4-121___

☐ INTRA-COMPANY TRANSMITTAL

☒ INTER-COMPANY TRANSMITTAL

☐ MAJOR PROBLEM TRANSMITTAL

☒ REPLY REQUESTED – REPLY BY __July 18, 1970__

TO __DDD Service Bureau__   INFORMATION COPIES TO _____

___Eastern Telephone Co.___   ___Division Traffic Supervisor___

___1422 No. Ring Street___   ___Western Telephone Co.___

___10 Flr.  Rm. 102___

___Reorder, New York   28913___

ANALYSIS OF __Billing tapes and 555-1212 print-out__

PROVIDED THE FOLLOWING PATTERN ___Repeated cases of charge condition causing___

___"Unmatched Messages" to 409-555-1212 - All intertoll trunks from Overflow___

___4A to Reorder XBT T/OK on supervision - Please investigate source of "off-___

___hook" supervision on these calls and advise.___

ISSUED BY __John Brown__   RETURN TO __DDD Service Bureau__

TELEPHONE NO __718-421-0819__   ___Western Telephone Co.___

ATTACHMENTS – ☒   ___1211 No. Answer Street___

___Copy to 409-555-1212 print-out___   ___6th Flr.   Rm. 630A___

___Overflow, Wisconsin  82914___

ACTION TAKEN-TROUBLE FOUND _____

_____

_____

_____

_____

DATE & TIME CLEARED   ☐-FOUND BEFORE RECEIPT OF PATTERN

_____   SIGNED_____   TITLE_____

# NETWORK SERVICE IMPROVEMENT

DATE __July 11, 1970__                    CASE NUMBER ___4-121___

☐ INTRA-COMPANY TRANSMITTAL

☒ INTER-COMPANY TRANSMITTAL

☐ MAJOR PROBLEM|TRANSMITTAL

☒ REPLY REQUESTED – REPLY BY ___July 18, 1970___

TO __DDD Service Bureau__          INFORMATION COPIES TO _____

__Eastern Telephone Co.__              Division Traffic Supervisor

__1422 No. Ring Street__               Western Telephone Co.

__10 Flr.  Rm. 102__

__Reorder, New York    28913__

---

ANALYSIS OF ___Billing tapes and 555-1212 print-out___

PROVIDED THE FOLLOWING PATTERN ___Repeated cases of charge condition causing___

___"Unmatched Messages" to 409-555-1212 - All intertoll trunks from Overflow___

___4A to Reorder XBT T/OK on supervision - Please investigate source of "off-___

___hook" supervision on these calls and advise.___

---

ISSUED BY __John Brown__                RETURN TO ___DDD Service Bureau___

TELEPHONE NO __718-421-0819__           ___Western Telephone Co.___

ATTACHMENTS – ☒                         ___1211 No. Answer Street___

__Copy of 409-555-1212 print-out__      ___6th Flr.   Rm. 630A___

                                        ___Overflow, Wisconsin  82914___

---

ACTION TAKEN-TROUBLE FOUND ___Found incorrect option on 3 of 28 information___

___trunks between Reorder XBT and Smokey #5 Office causing improper operation___

___of SV relay.  Please advise if condition continues or reoccurs.___

---

DATE & TIME CLEARED                ☐ FOUND BEFORE RECEIPT OF PATTERN

__July 14, 10:30 AM__              ___I. Foundit - Plant Supv. - DDD___

                                   SIGNED                    TITLE

## DDD BUREAU ACTIVITY SUMMARY

COMPANY_____ BUREAU_____
PRIME AREA _____

| OPERATOR REPORT DATA | 19 | | | | | |
|---|---|---|---|---|---|---|
| TOTAL OPERATOR REPORTS | | | | | | |
| NO. OF PRIME AREA REPORTS | | | | | | |
| % PRIME AREA OF TOTAL | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| OPERATOR HOLD & TRACE  INCLUDES ABANDONS | | | | | | |
| NO. OF TRACES -PRIME AREA | | | | | | |
| NO. OVER 30 MINUTES-PRIME AREA | | | | | | |
| NO. OF TROUBLES FOUND-PRIME AREA | | | | | | |
| % FOUND TROUBLES-PRIME AREA | | | | | | |
| NO. OF TRACES OUTSIDE PRIME AREA | | | | | | |
| NO. OVER 30 MINUTES-OUTSIDE PRIME AREA | | | | | | |
| NO. OF TROUBLES FOUND-OUTSIDE PRIME AREA | | | | | | |
| % FOUND TROUBLES-OUTSIDE PRIME AREA | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| PATTERN REFERRAL DATA | | | | | | |
| NO. PATTERNS REFERRED-ALL SOURCES | | | | | | |
| NO. PATTERNS WITH FOUND TROUBLES | | | | | | |
| % PATTERNS WITH FOUND TROUBLES | | | | | | |
| | | | | | | |
| NO. PATTERNS-MECH. RO. TRAP | | | | | | |
| % PATTERNS WITH FOUND TROUBLES | | | | | | |
| NO. E.B.A.C. PATTERNS REFERRED | | | | | | |
| % PATTERNS WITH FOUND TROUBLES | | | | | | |
| | | | | | | |
| | | | | | | |
| CALL-THRU TEST DATA | | | | | | |
| NO. OF TESTS IN PRIME AREA | | | | | | |
| % FOUND TBLS – PRIME AREA | | | | | | |
| NO. OF TESTS OUTSIDE PRIME AREA | | | | | | |
| % FOUND TBLS – OUTSIDE PRIME AREA | | | | | | |

## MAJOR SERVICE-AFFECTING FAILURES

| Failure | Location | Date | Duration | Extent Service Was Affected |
|---------|----------|------|----------|------------------------------|
|  |  |  |  |  |
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