NETWORK DESIGN ORDER PREPARATION
NO. 1/1A ELECTRONIC SWITCHING SYSTEM

CONTENTS

EXHIBITS

1. GENERAL

1.01 This section covers the preparation of a Network Design Order (NDO) for No. 1/1A Electronic Switching System (ESS) equipment, and is a total replacement for TDI 45, Section E, and the parts of A, B, and C which relate to 1/1A ESS. As such, it shall be the primary source document for all Southwestern Bell Telephone Company policies in regard to No. 1/1A ESS NDO preparation. It specifies a uniform format that should be followed for all such NDOs.

1.02 This section is reissued to provide, in part, a revised Network Design Order format, to eliminate redundant D&F information, and to revise several NDO forms.

USE OF COEES-MO

1.03 All No. 1/1A ESS NDOs shall make use of the Central Office Equipment Engineering System--Mechanized Ordering (COEES-MO) as both a tool during the Network Design process and as the vehicle for production of the basic content of the order. However, it is the responsibility of the network designer to assure adherence to all applicable Southwestern Bell policies and practices, whether or not they agree with COEES-MO routines.

ESS RESOURCE MATERIAL

1.04 The fundamentals of Network Design as applied to No. 1/1A ESS Central Office Equipment (COE) are explained in Bell System Practices (BSPs) 231-XXX-XXX. Further information may be obtained by consulting the following Bell System Practices and publications:

66X-XXX-XXX -- Test Center Operation
680-XXX-XXX -- Plant Assignments
820-XXX-XXX -- Equipment Design and General Requirements
966-XXX-XXX -- General Description
759-1XX-XXX -- Central Office Equipment Engineering System (COEES)
TG1A - No. 1 ESS 2-Wire Translation Guide
E-8056 -- Questionnaire for No. 1 ESS Equipment
-- D&F DBS Users Manual

J1A063A-1	-- Trunk and Service Circuit Engineering Specification
E-8056A	-- Equipment Notes for E-8056 Questionnaire
E-8056P	-- Preplanning Questionnaire for No. 1 ESS Equipment
E-8070	-- Questionnaire for Junctor Assignments in No. 1 ESS 2-Wire Offices
E-8086	-- Questionnaire for No. 1 ESS Translation Data Recovery and Reprocessing System Services
E-8123	-- No. 1A ESS Questionnaire
PG-1	-- Parameter Guide-No. 1 ESS
PG-1A	-- Parameter Guide-No. 1A ESS
PG-6A001	-- No. 1A ESS Translation Output Configuration
IM-1A001	-- Input Message Manual
OM-1A001	-- Output Message Manual
PA-591001	-- No. 1 ESS Parameter Specification
PA-591003	-- Translation Output Configuration
PA-591092	-- TAA and TRR Users' Manual
PA-591099	-- Growth Recent Change (GRC) Forms

Southwestern Bell Correspondence File Subjects ND 10.331 and 225.01XX, and AT&T system letters.

2. ASSUMPTIONS

JOB NEED, BUDGET & EQUIPMENT ALLOCATION

2.01 This section assumes that the need for a COE job has been determined by standard company policy and practices and that it has been properly and accurately scheduled. This also assumes that the job has been included in the budget, and the equipment has been allocated.

3. NETWORK DESIGN RESPONSIBILITY

3.01 It is the designer's responsibility to cover all aspects of traffic sensitive COE provisioning according to published system and SWBT Company policies and procedures, and to provide adequate correct information to be input to the Demand and Facility Chart Data Base System (D&F DBS).

4. PURPOSE OF THE NETWORK DESIGN ORDER

4.01 A NDO, also referred to in System documentation as a traffic order, is the basic summary of amounts and arrangements of traffic sensitive switching and trunking equipment required to meet established service objectives for a given group of customers. The NDO contains the historical data, projections, computations and judgement decisions that are used to determine the basic office configurations. Where applicable, it should also quote the policies and practices necessary for authorizations. With advanced mechanization of data, much of the tedious manipulation and repetition of information can be left to computer programs, saving time and effort for the network designer. The COEES-MO is the only recognized method for preparation of a No. 1/1A ESS Network Design Order. It is designed to provide a large portion of the content of a complete NDO.

5. TYPES OF NETWORK DESIGN ORDERS

5.01 There are four types of NDOs identified by a sequential number of the form 8X-S-X to XXX (where 8X is the year of preparation, S is the section, area, or other design group designation, and X to XXX represents the sequence number).

COMPLETE ORDER (80-S-1)

5.02 A Complete NDO for 1/1A ESS Equipment is composed of, at least, the following pages and reports. These reports and pages must be in the order given.

Basic Data:

- Facesheet (See Exhibit 1)
- General Notes and CTX Information
- CAPFIT Run (Required for No. 1A ESS Upgrades)
- Summary of Basic Data (See Exhibit 2)
- Forecast of Lines and Main Telephones
- Originating and Terminating Trunk Group Summaries (forecasts)
- Line Capacity Worksheet (See Exhibit 3)
- No. 1/1A ESS Utilization Report (See Exhibits 4 and 5)
- "GØ Plan" Output Report (COEES Planning)
- Traffic Growth Chart (See Exhibit 6)
- Service Circuit Loads and Trends (See Exhibit 7)
- Data Conversion Worksheets (Initial Office Jobs Only)
- Input List (Report No. 1)
- Edit and Override List (Report No. 2)
- Service Check Report (Report No. 3)
- Call Capacity Analysis (Report No. 4)
- Network Analysis (Report No. 5)
- Detailed Equipment List (Report No. 6)
- Office Capability List (Report No. 7)
- E-8070 - Junctor Assignment Program (JAP) Questionnaire

Wherever feasible, the network designer should issue a Complete Order via COEES-MO.

A Complete Order insures that essential details of the office configuration will not be overlooked in the order-writing process. In addition, issuance of a Complete Order simplifies its use as a source of information about the office by Network Administrators or others. Whenever an NDO that physically modifies the office and changes the facesheet and/or the D&F DBS capacities is written, it must be a Complete Order.

It should be noted that a supplement order will be required approximately 12 weeks prior to the Western Electric ship date in order to transmit the final version of the Parameter Requirements and Set Card Order.

PARTIAL ORDER (80-S-3P)

5.03 Partial Orders are issued for relatively minor changes or additions to an office when there is no outstanding Network Design Order (unfinished job-in-progress). A Partial Order is never acceptable when the work to be done will effect a change on the facesheet or D&F DBS (i.e., capacity or exhaust date). A Partial Order is composed of only the particular pages of a previous Complete Order that are added to or changed. It is important that all pages relating to the changes initiated by the Partial Order be included in the NDO. The reissued pages should be numbered identically with the pages from the Complete Order that they replace. Additional pages should be given a letter suffix so they may be inserted in the proper sequence. The numbers of the NDO pages changed by the Partial Order should be indicated on its facesheet, and the next (subsequent) Complete Order should incorporate all of the changes. A Partial Order should not be issued following another Partial if a Complete Order has not been issued within 18 months.

SUPPLEMENT (APPENDIX) ORDER (80-S-2 S1)

5.04 The appendix function of COEES-MO is designed to make it possible for the network designer to make corrections, changes, and/or minor additions to outstanding NDOs. It is also used to issue the final Set Card Order 12 weeks prior to the Western Electric ship date. A Supplement may be used to provide corrections to the facesheet and/or D&F DBS on jobs that have not been completed. As in the case of a Partial Order, all pages of the Complete Order which are affected by the Supplement's changes should be included, and their numbers listed on the facesheet. Lastly, a Supplement Order is to be used whenever it becomes necessary to cancel an outstanding job.

5.05 A Supplement shall not be used to change any part of a completed job, nor should it be employed to make major changes in an outstanding job (examples: change concentration ratio, extend the life of the job with a major component, or retrofit to a 1A processor).

REVISED ORDER (80-S-4R)

5.06 A Revised Order is a total reissue of an outstanding Complete or Partial Network Design Order when changes are significant. The suffix R should also be used when it is necessary to correct the NDO of a completed job for record purposes. The sequence number should be the same as that of the NDO which is being replaced.

6. OBJECTIVES OF NETWORK DESIGN

KIND, PLACE, TIME AND QUANTITY

6.01 Good network design has as its objective the provision of the right kind of equipment at the right place at the right time and in the right quantity to give high quality service to all network customers with a minimum of capital dollar investment. In estimating equipment requirements, the network designer must predict busy hour usage (and/or attempts) at some future point in time, perhaps three or four years away. The designer must decide when the equipment should be installed and when the growth for which it is provided has been attained.

LOAD SERVICE RELATIONSHIP

6.02 It is the policy of Southwestern Bell to provide switching equipment and facilities in such quantity, type and location that there is a reasonable balance between the quality of service rendered and the cost to the Company to give that service. Design methods and the tables which serve as engineering bases have been developed on that relationship.

6.03 Aside from good mechanical and electrical performance in setting up calls and freedom from human error, customers are interested in two principal phases of their telephone service:

1. The frequency with which connections to the desired telephone are established on the first attempt.

2. The length of time required to complete the connection.

These areas of customer concern may be restated as several network design considerations:

1. The elapsed time during which each call occupies switching facilities.

2. The number of talking channels available in any group to handle the total calls offered.

3. The efficiency of the groups of channels.

4. The grade of service which can be provided to a given call load of certain established characteristics.

These considerations must translate to estimates of future traffic levels that can be handled by the switching office at the desired grade of service. Capacity and blocking tables have been developed by the Bell Telephone Laboratories and are included in the No. 1/1A ESS BSPs. The following service criteria have been authorized in Southwestern Bell ESS offices for Busy Season, Busy Hour, at the peak of the engineering interval:

Busy Hour Dial Tone Delay over 3 seconds - no more than 1.5%
Busy Hour Originating Matching Loss - no more than 1.0%
Busy Hour Incoming Matching Loss - no more than 2.0%
Busy Hour Incoming First Failure to Match - no more than 2.3%

DEFINITION OF BUSY SEASON

6.04 The busy season for local offices is defined as the three months, not necessarily consecutive, during a 12 consecutive month period, with the highest average busy hour CCS load per main station (M+EMT).

EFFECTIVE USE OF SERVICE RESULTS INFORMATION

6.05 Recognition of the fact that network design criteria are based upon System averages means the network designer must, as soon as possible after the conversion of an office to ESS, begin to track its service results. These results may indicate a significant deviation in its load/service characteristics from those averages, for which compensation may be indicated in growth additions. For example, an office which is nearing its stated capacity but which consistently performs with 0% matching loss is obviously not as close to its actual switching capacity as one of a similar size and configuration which is experiencing some matching loss. On the other hand, a machine that is continually experiencing noticeable matching loss may need attention even though it has not yet reached the main station quantity stated as its switching capacity. It is important for the designer to be aware of both the service results condition and its potential effect on customer satisfaction and capital dollar investment.

7. PREPARATION OF THE NETWORK DESIGN ORDER

FIRST STEP

7.01 The first step in the development of a NDO for No. 1/1A ESS equipment is the assembly of all data pertinent to the office. This involves receipt of a validated Wire Center Area Forecast and appropriate trunk forecasts as well as the acquisition of sufficient validated historical data to develop a CCS/MS projection. As much PBX/CTX projected information as possible should be obtained at the beginning of the process.

CAPACITIES IN M+EMT

7.02 The M+EMT switching equipment capacity of an ESS entity is the maximum number of main plus equivalent main telephones that can be served by the switching equipment of that office without exceeding the service objectives (either originating or terminating) for the average busy hour in the busy season just prior to the entity's exhaust. Switching equipment is the inclusive term for the various items of common control ESS equipment in the machine. The smallest

"maximum number of M+EMT" is the limitation defined as the "Switching Equipment Capacity" of the office. The number of M+EMT multiplied by the projected CCS/MS represents the office switching capacity expressed in CCS. The term "main station capacity" is used interchangeably with capacity in M+EMT.

APPROACH TO ADMINISTRATIVE MARGINS

7.03 Since interoffice trunk forecasting and engineering is separate from individual wire center network design, the capacity of a dial entity should not be limited by trunk circuits. In general, a 5% "administrative" allotment of TLN terminations should be provided over and above the requirements stated in the current trunk forecast for the peak of the engineering interval. In no case should the 5% figure be used to justify the expenditure for an additional frame. Further, this 5% should not be added if the trunk forecast is already supplemented with 5% spare TOCs. Certainly as the office increases in size, engineering judgement would dictate that the objective TLN fill be modified upward where required due to frame breakage.

7.04 Frame breakage has an even greater impact upon LLNs because of the various concentration ratios and possible configurations of fractional networks. The objective administrative line fill should be no lower than 95% unless justified by the history of the office and supported by an administrative line study. In all cases, the percent fill should be computed on the form illustrated by Exhibit 3, recognizing the need to adjust the percent so as to prevent "breaking over" into additional frames.

USE OF DATA

7.05 For an initial ESS conversion job, the historical data should be assimilated via Data Conversion Worksheets (refer to BSP 231-061-110) into comparable ESS data. In the case of a growth addition to an existing ESS, validated COER (formerly PATROL) data is used to project usage (CCS/MS) and/or attempts (CR/MS) for various service circuits as well as line link networks, trunk link networks, and junctors. These projections in graphical form are a required part of each Complete NDO and, after their preparation during the initial office conversion, should require only that the network designer assure that they are current and appropriately projected in the light of recent actual data. Exhibits 6 and 7 illustrate some of these graphs. Data Profiles, a data base containing COER data, can be used to generate mechanized graphs to comply with the aforementioned requirements. Before use, the designer should insure the validity of the Data Profiles data base.

COEES-PLANNING

7.06 These data items then become inputs to the No. 1/1A ESS COEES Planning System wherein the network designer is able to determine the most favorable length of engineering interval for the job to be designed. (Refer to BISPs 759-150-124 and 759-120-120.) Ordinarily, the sizing recommendation resulting from the planning run is the interval around which the job should be designed and a copy of the "GØ PLAN" output report should be included in each Complete NDO. There may be circumstances which require a different selection, such as the limitation imposed by building size, an area cut, or even an unusual change in economic situation; therefore, the decision as to engineering interval length cannot be made unilaterally. Although Network Design is charged with the responsi-

bility for the capacities and exhaust dates for the job, the designer must coordinate with all those directly concerned with the scheduling of central office equipment and facilities. Any deviation from the "GØ PLAN" report must be documented in the NDO.

COEES-MECHANIZED ORDERING

7.07 Once the data has been validated and assimilated, the concentration ratio selected or verified, and the job size established, the network designer should proceed to the determination of inputs to COEES-MO. BISP 759-120-140 (No. 1/1A ESS Mechanized Ordering--Traffic Engineering Considerations, User and Administrative Guide) explains the functions and outputs of this system. The network designer must be particularly aware of the default values so as to prevent errors in or misunderstandings of the final equipment configurations. A thorough understanding of the hierarchial structure of the COEES algorithms is also essential to proper use of this network design tool.

HARMONY

7.08 Harmony is defined as that condition where all components (major and minor) exhaust at the same point in time. Major components consist of Networks, Stores, major frames, etc. Minor components consist of Service Circuits, IAO trunks, miscellaneous units, etc. The objective of the network designer shall be to achieve harmony where practical, and most COE jobs should be designed so as to limit the proposed office on a major component. Success in this endeavor will be evidenced by efficient use of the equipment provided, as projected on No. 1/1A ESS Utilization Report. It may also have a decided impact upon the actual design length of the job. Once harmony, if indicated, has been achieved, the order can be "frozen". The printed reports can be requested from the system, and the network designer may begin finalizing the NDO.

GENERAL NOTES

7.09 The General Notes pages should explain numbering plans, unusual arrangements of hardware or software, and requirements for optionally loaded (extra-cost) feature packages, as well as any other pertinent information of an explanatory nature. Schematic diagrams, particularly of centrex arrangements, are often helpful.

CAPACITY DETERMINATION WORKSHEETS

7.10 The preparation of Capacity Determination Worksheets is covered in BSP 231-061-130. These worksheets serve as an excellent tool for communicating to those concerned, the capacities of all significant items in the ESS machine. Although necessary for NDO preparation, they are not required as a part of the NDO.

NO. 1/1A UTILIZATION REPORT

7.11 From the Capacity Determination Worksheets/COEES Service Check, it is necessary to obtain certain items of information for inclusion in the No. 1/1A ESS Utilization Report. (See Exhibits 4 and 5.) This report must be submitted as a part of each NDO and will be forwarded to the AT&T Company separately for analysis purposes. In HILO machines, separate Utilization Reports for the 2-wire and 4-wire equipment will be required. It is the responsibility of the network designer to assure that the central office job is designed to meet as nearly as possible the objectives of having the right kind of equipment in the right place at the right time and in the right quantity. Obviously, the objectives are best met when the utilizations are high. (That is, as near to 100% as is

possible and practical. In very small circuit groups, breakage may be such that it is impossible to achieve a utilization in the 95 to 100% range.) The network designer should insure that any equipment which will not be fully utilized by the end of the current and subsequent design intervals will be removed from the office. This policy should be applied to all components of COE (Universal Trunk Circuits, Miscellaneous Trunk Circuits, HILO Trunk Circuits, Line Equipment, Recorded Announcement Frames, etc.).

7.12 The equipment should be physically removed from the office to recover processor real time in scanning. If removal costs are prohibitive, the equipment may be retired-in-place.

8. FURTHER EXPLANATIONS

8.01 The following paragraphs describe some of the required components of a Complete Network Design Order. Some of the forms at the end are blank copies suitable to be reproduced in local copy bureaus. Other exhibits are merely representative and may be modified to suit sectional requirements.

FACESHEET (SW-7626)

8.02 Exhibit 1 illustrates the facesheet required for No. 1/1A ESS offices. Definitions for most of the items of information in the boxed in capacities section are listed in the Demand and Facility Data Base System (D&F DBS) Input Manual. However, the Most Limiting Item is not necessarily the Limiting Switching Equipment Item as encoded for D&F DBS, but rather the item which first limits the growth of the office. (lines, numbers, LLN load or MF Xmtrs, for example.) The heading of an ESS Network Design Order should always contain the Entity Name, the Equipment Type, the Common Language Location Identification (CLLI) Code, Estimate Request Number, the Job Record Sheet Number, and the Required for Service Date of the job.

8.03 The CLLI Code is an 11-character mnemonic code that uniquely identifies a specific location. It is broken down for local switching equipment generally as follows:
City - 4 characters, State - 2 characters, Building - 2 characters, Entity - 3 characters.
The entity name in No. 1/1A offices will frequently be stated CGX, where X represents the Control Group Number.

8.04 Refer to BSP Section 795-000-000 Index listing for the BSP for individual states' CLLI codes if one has been established for the switching office. If one has not yet been established, the network designer should contact the CLLI Coordinator in the appropriate Network Engineering group.

8.05 The Nature and Necessity for Work area of this facesheet should reflect careful thought and consideration by the network designer. Full explanation of the job requirements and authorizations is required. Any information having an impact on the decision to meet dates or expend capital dollars can be included.

8.06 The considerations involved in preparing a Network Design Order may involve all Departments and Western Electric. It is vital that the work be carefully done and the decisions reached knowledgeably and objectively. The facesheet is the summarization and presentation of all of the designer's efforts; it should be an indication of how well these responsibilities have been discharged.

DEMAND AND FACILITY CHART DATA BASE SYSTEM

8.07 The Demand and Facility Chart is the summary of a switching office job schedule and its effect on construction budgeting. Any job which impacts the capacities of an ESS machine will be reflected on the D&F Chart.

8.08 Southwestern Bell leases computer memory from the AT&T Company and uses a program called Demand and Facility Chart Data Base System (D&F DBS) to support the file of facility chart information and to produce numerous reports as well as the charts themselves. It is imperative that information maintained in the system be as accurate and up-to-date as possible. To facilitate the transfer of information from the Network Design Order to the D&F data base, it is recommended that updates be marked directly onto the Part B.

8.09 The Demand and Facility Chart Data Base System Input Manual should be consulted whenever clarification is required for a definition of an input item.

8.10 TRUNK SUMMARY

Item three of the NDO is the Originating and Terminating Trunk Group Summaries report. This report should summarize by Trunk Order Code (TOC), all trunks and service circuits. Included in this report should be beginning of period and end of period requirements plus a separate entry for spares - for each TOC.

Each section shall use a form suitable for their own purposes, providing it includes the above information as a minimum.

8.11 SERVICE RESULTS GRAPH

This graph is used to display Dial Tone Speed and Matching Loss historical results for an entity. The D&F Chart Part A contains this same information in tabular form. If the Part A is included in the NDO and the Network Design Engineer has verified that the service results data is accurately posted, then the Service Results Graph may be discontinued.

8.12 TRAFFIC GROWTH CHART

When the D&F Chart, Part A, contains at least four busy seasons of historical data, it may be substituted in the NDO for the Traffic Growth Chart. Otherwise, the Traffic Growth Chart will continue to be required in order to show the additional historical data not shown on the Part A. This will occur on dial-dial conversions where the new entity Part A will not show the old entity historical data. Since the Part A CCS/MS graph is smaller in area than the Traffic Growth Chart, it must be examined by the Network Design Engineer to insure legibility. Part A charts in NDOs routing for approval or in Estimate Requests routing for approval must be full size.

Southwestern Bell

EXHIBIT 1

Form SW-7626
(Rev. 8-82)

Retention Period-See J.P. 47

NETWORK DEPARTMENT
NETWORK ENGINEERING

NETWORK DESIGN ORDER NO. _____

APPROVAL DATE _____

_____ SECTION

Entity Name/Equipment Type _____

CLLI _____ (City / State / Bldg / Entity)

Estimate Request No. _____

WCAF Dated _____ Validated _____ Job Record Sheet No. _____

Trunk Forecast Dated _____ Validated _____ Required For Service Date _____

Nature and Necessity For Work:

SUMMARY OF EQUIPMENT CAPACITIES

		PRESENT	PROPOSED
GENERIC			
LU/LLN/LTN CONCENTRATION RATIO			
SWITCHING EQUIPMENT	CCS CAPACITY - SW		
	M + EMT CAPACITY - SW		
TALKING CHANNELS	CCS CAPACITY - TC		
	M + EMT CAPACITY - TC		
LINES	INSTALLED		
	TERMINATION CAPACITY (LINES)		
	TERMINATION CAPACITY (M + EMT)		
	EXHAUST DATE		
TERMINALS OR NUMBERS	INSTALLED		
	TERMINATION CAPACITY (M + EMT)		
MOST LIMITING SWITCHING ITEM	D&F CODE		
MOST LIMITING	ITEM		
	OFFICE MS CAPACITY		
	DATE OF OFFICE EXHAUST		
_____ CCS/MS AT OFFICE EXHAUST			

Signature and Title **Telephone Number**

PREPARED: _____ ( )

CHECKED: _____ ( )

CHECKED: _____ ( )

RECOMMENDED: _____ ( )

APPROVED: _____ ( )

EXHIBIT 2

Summary of Basic Data

Line Link Network Data

LLN Concentration Ratio _____
Concentrator type (2:1 or 4:1) _____
LSC/LSFs Per Full LLN _____
LLNs Equipped _____
CCS/MS (EOP) _____

Trunk Link Network Data

Trunk Concentration Ratio _____
TLN Type (1024 or 2048) _____
TSC/TSF Per Full TLN _____
TLN's Equipped _____
CCS/Trunk Termination (EOP) _____

ABS-BH End Of Period Call Data

Total Incoming Calls
(Incoming Term. and Tandem) _____
- Incoming Terminating _____
- Tandem Thru Switched _____
Total Originating Calls _____
- Originating Outgoing _____
- Originating Intraoffice _____
Total Originating and Terminating _____
Total Originating+Incoming _____
Incoming By-Link Calls _____
- Average Digits Per By-Link Call _____
Incoming MF Calls _____
Incoming DP Calls _____
Outgoing MF Calls _____
Outgoing DP Calls _____

Southwestern Bell

SW-7628
(9-82)

Retention Period: See J.P. 47

EXHIBIT 3

OFFICE _____

NDO # _____

GENERIC _____

DATE _____

LINE CAPACITY WORKSHEET
ESS JOBS

1] TOTAL LINES INSTALLED		_____ *
2] RSS CHANNELS	_____	
3] SCREENING LENS/TENS (If Required)	_____	
4] PLANT TEST LINES	_____	
5] NO TEST LENS/TENS	_____	
6] TRUNKS AND SERVICE CIRCUITS (Folded Networks Only)	_____	
7] UNAVAILABLE LINES (Total Items 2 Thru 6)		_____ *
8] ASSIGNMENT LISTS	_____	
9] CABLE THROWS	_____	
10] MAINTENANCE SPARE	_____	
11] ADMINISTRATIVE MARGIN (Total Items 8 Thru 10)		_____
12] WORKABLE LINES (Item 1 Less Item 7 and 11)		_____ *
13] AVAILABLE LINES (Item 1 Less Item 7)	_____	
14] DERIVED % Fill (Item 12 ÷ Item 13 times 100)		_____ *
15] MS to LINE RATIO at EOP	_____	
16] LINE CAPACITY STATED IN MS (Item 12 Times Item 15)		_____ *
17] FORECASTED MS as of _____ [EOP]	_____	
18] UNUSED MS (Item 16 Less Item 17)	_____	
19] FORECASTED MS GROWTH PER MONTH	_____	
20] NUMBER OF MONTHS GROWTH PAST EOP (Item 18 ÷ Item 19, Rounded Up)	_____	
21] EXHAUST DATE		_____ *

NOTES: * = Face Sheet or D&F Item
MS = Main plus equivalent main telephone

NO. 1/1A ESS UTILIZATION REPORT

Date 8/26/79 No 1 ESS
Office (CLLI Code) HSTNTXJACGO
City & State Houston, Texas
Service Date For New Job 10/80
Exhaust Date For New Job 6/83

Report Prepared By Jane Doe
Title Specialist-N.D.Swg.So.
Submitted By _____
Title _____

Return Completed Report To: N. D. Blair
Rm 3453C2
295 N. Maple Avenue
Basking Ridge, N.J. 07920

Service Circuits	Latest Busy Season Data: Total Circuits Provided	Circuits Provided For Traffic	CCS Capacity Provided	CCS Demand	CCS Percent Utilization	Highest Busy Season For This Addition: Total Circuits Provided	Circuits Provided For Traffic	CCS Capacity Provided	CCS Demand	% Annual Increase In Demand	CCS Percent Utilization
*	A1.0 Col. 4	A1.0 Col. 5	A1.0 Col. 7	A1.0 Col. 12or16	A1.0 Col. 17	A1.0 Col. 4	A1.0 Col. 5	A1.0 Col. 7	A1.0 Col. 12 Or 16		A1.0 Col. 17
MF Receivers	34	32	732	706	96.4	45	42	1083	1008	3.00	98.5
DP Receivers	8	0	0	0	-	2	0	0	0	-	-
MF Transmitters	58	55	1256	764	60.8	54	51	1143	1109	31.1	97.0
DP Transmitters	40	38	783	252	38.2	20	18	276	252	0	91.3*
Customer Digit Receivers – DP	0	0	0	0	-	0	0	0	0	-	-
Customer Digit Receivers – TT	340	335	11016	7271	66.0	284	280	8323	8152	10.8	97.9
Regular Ringing Circuits	228	226	6566	3730	56.8	156	154	4265	3856	3.5	90.9*
Audible Ringing Circuits	225	223	6469	3982	61.6	156	154	4265	4108	3.1	96.3
*	A3.0 Col. 4	A3.0 Col. 5	A3.0 Col. 7	A3.0 Col. 10	A3.0 Col. 12	A3.0 Col. 4	A3.0 Col. 5	A3.0 Col. 7	A3.0 Col. 10		A3.0 Col. 12
3 Port Conference Circuits	72	68	1632	932	57.1	97	92	2346	2343	60.2	100.0

*Data Invalid. More Ckts. Will Be Removed On Next Job If Load Does Not Incr.

Networks	Latest Busy Season Data: LJR	Percent Admin. Margin	CCS Per Working Line	LSC Installed	LEN Percent Utilization	CCS Percent Utilization	Highest Busy Season For This Addition: LJR	Percent Admin. Margin	CCS Per Working Line	LSC Installed	LEN Percent Utilization	CCS Percent Utilization	BCRC/MCRC Planned
LLN *				B Col. 4	B Col. 10	B Col. 16				B Col. 4	B Col. 10	B Col. 16	
	2:1	12	4.51	60	94	50	2:1	'10**	4.51	60	94	54	Yes

TLN	TJR	Network Size 1024/2048	CCS Per Working Terminal	TSC Installed	TNN Percent Utilization	CCS Percent Utilization	TJR	Network Size 1024/2048	CCS Per Working Terminal	TSC Installed	TNN Percent Utilization	CCS Percent Utilization	BCRC Planned
Local Or Combined Office *				C1.0 Col. 4	C1.0 Col. 9	C1.0 Col. 12				C1.0 Col. 4	C1.0 Col. 9	C1.0 Col. 12	
2 Wire	1:1	1024	9.44	60	98	56	1:1	1024	13.2	60	98	95	No
4 Wire (HILO)													
No LLN Office *				C2.0 Col. 5	C2.0 Col. 10	C2.0 Col. 15				C2.0 Col. 5	C2.0 Col. 10	C2.0 Col. 15	
2 Wire													
4 Wire (HILO)													

*Section And Column Numbers Refer To Network Design BSP 231-061-130

**See Adm. Line Study Page 24 of the NDD.

NO. 1/1A ESS UTILIZATION REPORT

Date October '79 No. 1 ESS
Office (CLLI Code) TULSOKTECGO
City & State Tulsa, Oklahoma
Service Date For New Job 11/81
Exhaust Date For New Job 1/84

Report Prepared By John Smith
Title Ntwk.Serv.Supv.-N.D.
Submitted By _____
Title _____

Return Completed Report To: N. D. Blair
Rm 3453C2
295 N. Maple Avenue
Basking Ridge, N.J. 07920

* Initial Job

Service Circuits	Latest Busy Season Data: Total Circuits Provided	Circuits Provided For Traffic	CCS Capacity Provided	CCS Demand	CCS Percent Utilization	Highest Busy Season For This Addition: Total Circuits Provided	Circuits Provided For Traffic	CCS Capacity Provided	CCS Demand	% Annual Increase In Demand	CCS Percent Utilization
•	A1.0 Col. 4	A1.0 Col. 5	A1.0 Col. 7	A1.0 Col. 12 or 16	A1.0 Col. 17	A1.0 Col. 4	A1.0 Col. 5	A1.0 Col. 7	A1.0 Col. 12 Or 16		A1.0 Col. 17
MF Receivers						14	13	220	215	-	97.73
DP Receivers						3	2	6	4	-	66.67*
MF Transmitters						18	17	253	247	-	97.63
DP Transmitters						6	5	27	13	-	48.15*
Customer Digit Receivers – DP						36	46	-	-	-	98.23
Customer Digit Receivers – TT						66	56	-	-	-	98.36
Regular Ringing Circuits						111	109	2224	2779	-	98.41
Audible Ringing Circuits						114	112	2956	2922	-	98.85
•	A3.0 Col. 4	A3.0 Col. 5	A3.0 Col. 7	A3.0 Col. 10	A3.0 Col. 12	A3.0 Col. 4	A3.0 Col. 5	A3.0 Col. 7	A3.0 Col. 10		A3.0 Col. 12
3 Port Conference Circuits						39	37	756	748	-	98.94

*Small Group Size-One Less Unit Takes Utilization Substantially over 100

Networks	Latest Busy Season Data: LJR	Percent Admin. Margin	CCS Per Working Line	LSC Installed	LEN Percent Utilization	CCS Percent Utilization	Highest Busy Season For This Addition: LJR	Percent Admin. Margin	CCS Per Working Line	LSC Installed	LEN Percent Utilization	CCS Percent Utilization	BCRC/MCRC Planned
LLN •				B Col. 4	B Col. 10	B Col. 16				B Col. 4	B Col. 10	B Col. 16	
							4:12	5	4.27	18	98	100	No

TLN Local Or Combined Office	TJR	Network Size 1024/2048	CCS Per Working Terminal	TSC Installed	TNN Percent Utilization	CCS Percent Utilization	TJR	Network Size 1024/2048	CCS Per Working Terminal	TSC Installed	TNN Percent Utilization	CCS Percent Utilization	BCRC Planned
•				C1.0 Col. 4	C1.0 Col. 9	C1.0 Col. 12				C1.0 Col. 4	C1.0 Col. 9	C1.0 Col. 12	
2 Wire							1:1	1024	16.92	15	95	95	No
4 Wire (HILO)													
No LLN Office •				C2.0 Col. 5	C2.0 Col. 10	C2.0 Col. 15				C2.0 Col. 5	C2.0 Col. 10	C2.0 Col. 15	
2 Wire													
4 Wire (HILO)													

• Section And Column Numbers Refer To Network Design BSP 231-061-130

NO. 1/1A ESS UTILIZATION REPORT

Date ___ ___ ___ No. ___ ESS
Office (CLLI Code) _____
City & State _____
Service Date For New Job _____
Exhaust Date For New Job _____

Report Prepared By _____
Title _____
Submitted By _____
Title _____

Return Completed Report To: N. D. Blair
Rm 3453C2
295 N. Maple Avenue
Basking Ridge, N.J. 07920

Service Circuits	Latest Busy Season Data: Total Circuits Provided	Circuits Provided For Traffic	CCS Capacity Provided	CCS Demand	CCS Percent Utilization	Highest Busy Season For This Addition: Total Circuits Provided	Circuits Provided For Traffic	CCS Capacity Provided	CCS Demand	% Annual Increase In Demand	CCS Percent Utilization
* MF Receivers	A1.0 Col. 4	A1.0 Col. 5	A1.0 Col. 7	A1.0 Col. 12or16	A1.0 Col. 17	A1.0 Col. 4	A1.0 Col. 5	A1.0 Col. 7	A1.0 Col. 12 Or 16		A1.0 Col. 17
DP Receivers											
MF Transmitters											
DP Transmitters											
Customer Digit Receivers – DP											
Customer Digit Receivers – TT											
Regular Ringing Circuits											
Audible Ringing Circuits											
* 3 Port Conference Circuits	A3.0 Col. 4	A3.0 Col. 5	A3.0 Col. 7	A3.0 Col. 10	A3.0 Col. 12	A3.0 Col. 4	A3.0 Col. 5	A3.0 Col. 7	A3.0 Col. 10		A3.0 Col. 12

Networks	Latest Busy Season Data: LJR	Percent Admin. Margin	CCS Per Working Line	LSC Installed	LEN Percent Utilization	CCS Percent Utilization	Highest Busy Season For This Addition: LJR	Percent Admin. Margin	CCS Per Working Line	LSC Installed	LEN Percent Utilization	CCS Percent Utilization	BCRC/MCRC Planned
* LLN				B Col. 4	B Col. 10	B Col. 16				B Col. 4	B Col. 10	B Col. 16	

TLN	TJR	Network Size 1024/2048	CCS Per Working Terminal	TSC Installed	TNN Percent Utilization	CCS Percent Utilization	TJR	Network Size 1024/2048	CCS Per Working Terminal	TSC Installed	TNN Percent Utilization	CCS Percent Utilization	BCRC Planned
Local Or Combined Office													
* 2 Wire				C1.0 Col. 4	C1.0 Col. 9	C1.0 Col. 12				C1.0 Col. 4	C1.0 Col. 9	C1.0 Col. 12	
4 Wire (HILO)													
No LLN Office													
* 2 Wire				C2.0 Col. 5	C2.0 Col. 10	C2.0 Col. 15				C2.0 Col. 5	C2.0 Col. 10	C2.0 Col. 15	
4 Wire (HILO)													

* Section And Column Numbers Refer To Network Design BSP 231-061-130

EXHIBIT 6

EXAMPLE OF NETWORK LOAD GRAPH

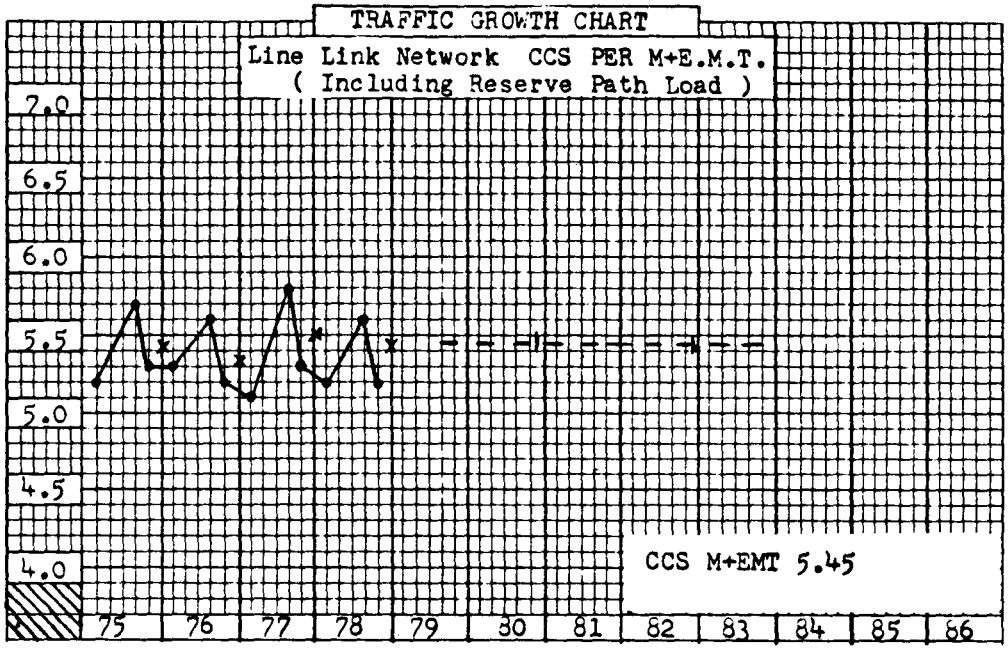

EXHIBIT 7

EXAMPLE OF SERVICE CIRCUIT LOAD GRAPH