

**SWITCHING SYSTEMS MANAGEMENT**  
**NO. 2 ELECTRONIC SWITCHING SYSTEM**  
**MACHINE CAPACITY MANAGEMENT**  
**INTRODUCTION**

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the current maintenance and administrative problems, is an excellent source of useful information for the network design engineer. This information may result in better timing of capital expenditures, more efficient use of equipment, and better service to the customer.

**2.03** Both the network administrator and the network design engineer must ensure that adequate traffic-sensitive central office equipment is scheduled to meet the actual and the anticipated customer demand. The equipment must provide customer service at the established objective levels during the current and future busy seasons and especially during the busy season prior to relief.

**2.04** The number of main stations that can be accommodated by the No. 2 ESS equipment is limited by the capability of the installed equipment to handle the offered traffic load. The limiting factor may be the result of an item of service circuit equipment (such as dial pulse or TOUCH-TONE® receivers, ringing circuits, etc), physical line or number capacity, the call-carrying capacity of the line trunk networks or junctors, or the call processor capacity. The item with the lowest main-station capacity represents the limiting factor of the switching machine.

**2.05** The network administrator should know the limiting factor in each office. When it becomes apparent that an office is overloaded, relief may be needed ahead of planned growth jobs. The network administrator must be able to determine which factors are capacity-limiting. Other relevant data should be examined to detect adverse trends in order that action can be taken or recommended early enough to avoid service-affecting conditions.

**2.06** Each equipment component in the No. 2 ESS has a stated capacity to serve customer demands, as does any switching machine. These components include customer digit receivers, incoming receivers, announcement circuits, and permanent signal tone trunks. When the customer demands exceed the engineered capacity of an item there is a good possibility that degraded service will result. By using the No. 2 ESS traffic measurements and other mechanized reports such as the Program for Administrative Reports On-Line (PATROL), the network administrator can monitor the demand that the customer is placing on the machine. Once the network administrator has some historical data, the customer demand can be predicted or a trend

can be established into the future. A determination can then be made as to when the machine will need relief. The future date on which customer demand will exceed the machine's capacity to handle the demand is called the *exhaust* date. Since each component is unique, the exhaust date of each component may be different.

**2.07** Various tools and methods are used to determine capacities. This section on machine capacity management is not intended to train the network administrator to engineer a No. 2 ESS office. It is intended rather to define and explain the terms and the methods used in capacity determination in order that a more effective job of network administration can be accomplished.

### 3. CAPACITY MANAGEMENT TOOLS

**3.01** The network administrator has a variety of administrative tools which provide the basis for establishing equipment capacities. The reliability of these tools depends upon timely, complete, and accurate data. The tools provide current service measurements and trends which aid in predicting future loads and equipment capacities. The tools include:

- (a) Demand and facility charts
- (b) Commercial forecasts of main-station growth
- (c) Load service curves
- (d) Percent fill reports.

A brief discussion of each of these capacity management tools is provided in 3.02 through 3.13.

#### DEMAND AND FACILITIES CHARTS

**3.02** The demand and facilities chart is designed to provide the following:

- (a) A Bell System standard interdepartmental local central office relief-planning and job-management tool which provides:
  - (1) An up-to-date picture of working main stations and actual usage rates and the current view of future gains in working main stations and usage rates

(2) The capacity of existing equipment and a current picture of the planned capacity additions.

(b) A recording vehicle for reporting consistent data (using standardization terminology and definitions) for planning, program review, and evaluation purposes.

(c) Supplemental information, including some of the following principal items:

(1) Service results such as dial-tone speed for the average busy season, highest days, office overflow on high days, load balance index, and incoming matching loss for average busy season

(2) Line and terminal main-station capacities

(3) Main-station capacities of the switching equipment, talking channel, etc

(4) Actual and trended CCS per main station, main-station-to-line ratio, objective percentage of line and terminal fills.

(5) Building capacities.

**3.03** The demand and facilities chart is not prepared and posted by the same organization in each company. However, the chart should be uniform in one respect: it should reflect the up-to-date conclusions of knowledgeable management based on valid data. Figure 1 is an example of a demand and facilities chart. Additional information on demand and facilities charts is available in Dial Facilities Management Practices, Division G, Section 4, Job Sizing and Timing Tools.

**COMMERCIAL FORECASTS OF MAIN-STATION GROWTH**

**3.04** A telephone main-station forecast is a carefully considered view of future growth in main stations and lines. Some commercial forecasts are for small areas (eg, central office areas and outside plant forecasting sections). Other commercial forecasts are useful in the administration of areas which are division-size or larger (eg, telephone movement, toll messages, and local and toll revenue).

**3.05** The central office forecast is a forecast of customer demand for central office lines and terminals by class of service for each central

office area. While forecasting is not an exact technique, it is, however, the best method presently available for predicting future conditions. To adequately plan for the future requires a forecast of what the future will be like.

**3.06** Since different customers have different characteristics, no single forecasting technique can be used to make a commercial forecast. The basic procedure is to examine the history of the area being forecast to determine why it grew in the past. The forecaster then attempts to discover factors which will change the rate of growth in the future. The following factors are among those which can change an area's growth pattern.

(a) **New Residential Construction:** New schools, changes in zoning laws, new highways, and large apartment projects are among the factors which affect the growth of a residential area. The commercial forecaster must keep in touch with home builders, city planners, and others who have knowledge of future community developments.

(b) **New Businesses or the Expansion of Existing Businesses:** Urban renewal projects, industrial parks, and major office buildings or factories can substantially increase the growth in a central office area.

(c) **Penetration of the Nonuser Market:** Many households in areas served by the Bell System may not have telephone service. The households which are not served are usually low-income households and are often located in rural areas or central cities. When economic activity is high, the income of low-income households tends to increase and consequently more of these households subscribe to telephone service. Much of the year-to-year volatility in telephone gain results from penetration, or lack of penetration, of the nonuser market.

(d) **Marketing Effort:** The demand for TOUCH-TONE and coin telephones, custom-calling services, and centrex service, for example, is dependent upon the effort exerted to sell them and the economic conditions of the area.

**3.07** The network administrator is likely to come in contact with a commercial forecaster when existing facilities are being used to nearly maximum

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capacity. When this is the case, an interdepartmental committee meeting should be arranged to discuss the severity of expected overload and the measures which can be taken to more efficiently utilize existing facilities until additional facilities can be installed.

**3.08** The network administrator can often aid the commercial forecaster and thus improve the plans for office growth. This aid may involve noting developments which may affect the area growth and relaying this information to the commercial forecaster. Additional information on forecasting methods is available in Dial Facilities Management Practices, Division A, Section 4c, Traffic Usage and Attempt Forecasting Methods and Control.

### LOAD SERVICE-MAIN STATION COMPARISON CHARTS

**3.09** Load-service curves are graphs of the load that an item receives versus the service the item provides (for example, customer digit receiver *versus* dial tone speed or junctor CCS *versus* matching loss). Data are plotted in graphic form for periods of time long enough to indicate trends. The chart is a good reference when reviewing load-service relationships with personnel in other departments and may be used to determine if service is following previous forecasts. The data that are basic to the load-service relationship includes the following.

- (a) Present and proposed main-station capacities and the current working main stations. The present main-station capacity should be the limiting capacity as shown on the demand and facilities chart.
- (b) Present and proposed busy-hour CCS capacities of the limiting equipment and the current busy-hour load in CCS. The limiting equipment and its CCS capacity are determined from load-service curves, where applicable, or from capacity and fill reports with CCS capacity obtained from capacity tables.
- (c) Busy-hour dial tone speed and incoming matching loss results.
- (d) The load balance index.

**3.10** Additional information on load-service curves is provided in Dial Facilities Management

Practices, Division H, Section 1b(2), Load Service Curves.

### CAPACITY AND FILL REPORTS

**3.11** Capacity and fill reports are used to show the load status of components of equipment in a particular office during a specific study period. The reports serve as a benchmark for validating data and are among the best tools available for this purpose.

**3.12** The load status of the following items can be shown on a capacity and fill report.

- (a) ***Lines, Main Stations, and Terminals:*** The percentage of working lines, main stations, or terminals of the published capacity is shown.
- (b) ***Trunks:*** Shown as the numerical difference between the working trunks in the group and the required trunks in the group.
- (c) ***Components:*** Shown as a percentage of actual capacity of a component.

**3.13** The capacities used in the reports are obtained from the latest completed telephone equipment order. Capacities may be adjusted as a result of the application of load-service curves or changes in traffic characteristics. Additional information on capacity and fill reports is available in Dial Facilities Management Practices, Division H, Section 1b(9), Determination of Line and Number Requirements.

### 4. CAPACITY MANAGEMENT DATA

**4.01** Data are defined as factual material used as a basis for making a decision. In machine capacity management, the decision that must be made is basically a decision on what constitutes sufficient equipment quantities. The accuracy of the answer to the question "what quantity of equipment is necessary to provide customer service at the objective levels" is dependent upon the availability and the accuracy of the data used.

**4.02** Capacity data may be line data, trunk data or network data. These areas of data are defined as follows.

- (a) ***Line Data:*** Line data are the responsibility of the customer services and marketing

departments. Basically, the network administrator must know the amount and rate of demand that will be placed on the No. 2 ESS machine. In addition, the demand for various services must be known. The primary source of this information will be the commercial forecast.

(b) **Trunk Data:** Trunk data are the responsibility of the trunking department. The trunking department will furnish a trunk estimate identifying the incoming and outgoing trunk fields. The network administrator must know the quantity and type of trunks. The type of pulsing, routing, and usage of the trunks must also be known.

(c) **Network Data:** Network data are the responsibility of the network design engineer and the network administrator. The network administrator is responsible for the collection and validation of network data, including data which deal with trunking. The network design engineer shares in the responsibility for validating the data.

#### CAPACITY DATA TIMING

**4.03** The capacity calculations require accurate data that are obtained when the switching equipment is experiencing both high and low usage. The network administrator is responsible for data acquisition for both busy and idle periods. Two high-usage time intervals that are important in capacity calculations are the office busy hour and the component (service circuit, etc) busy hour. Both of these busy hours are determined during the office busy season.

**4.04 Office Busy Hour:** The office busy hour is generally defined as the average business-day hour with the highest average network or main-station usage. Office busy hours for a No. 2 ESS are selected by obtaining usage data at the wire junctor and circuit junctor groups. The sum of the usage data in these groups will provide a total of the junctor usage within a No. 2 ESS office. A review of the usage data for each hour will indicate the office busy hour. Additional information on busy-hour determination is provided in Dial Facilities Management Practices, Division H, Section 1c(2), Busy Hour Determination, and Division H, Section 10k, No. 2 ESS Job Sizing and Timing.

**4.05 Component Busy Hours (Service Circuit Busy Hours):** Service circuits are the ESS equivalent of components in mechanical switching systems. Network administrators require similar data on ESS service circuits as are provided on components. A component (service circuit) busy hour is defined as the average business-day hour with the highest CCS usage of the individual equipment component (service circuit). Selection of the ESS service circuit busy hour is accomplished by reviewing usage data for each service-circuit group on an individual basis. The busy hour of a service-circuit group should be determined each time busy hour studies are conducted.

**4.06** Components may have a busy hour different from the office busy hour. In those instances it is necessary to collect and report data on the service circuits when they are busiest and not when the rest of the office is busiest. (The data must be collected when the service-circuit group is experiencing its heaviest usage.)

**4.07** The No. 2 ESS busy-hour studies are generally made semiannually (twice yearly). Additional busy-hour studies are also made immediately after cutover and when any significant change occurs in office characteristics which affects calling patterns. The postcutover determination is usually conducted during weeks two through four after cutover. It is advisable to avoid busy-hour studies during the first week after cutover for several reasons. First of all, the data will likely be distorted as a result of customer reaction to the new dial tone, new services, new equipment, etc. Secondly, during the first week after cutover the network administrator is usually very involved in getting the office set up. The first week can be used, however, for sampling key data such as **originating and terminating peg count and total originating and terminating usage**. These data will assist in determining a starting point in the busy-hour determination process. Additional information on component busy-hour determination is available in Dial Facilities Management Practices, Division H, Section 1c(2), Busy Hour Determination, and Division H, Section 10k, No. 2 ESS Job Sizing and Timing.

**4.08 Busy Season:** Busy-hour determinations are made a minimum of once during busy season and once a year out of busy season. The busy-season months are not normally selected until the end of the busy-season period. **The busy season is defined as the three months,**

*not necessarily consecutive, with the highest average business day busy hour CCS per main-station load in the office.* Note that main-stations are incorporated into in busy-season determination. (It is generally considered advantageous to do busy hour determinations during the first of the three busy-season months.) Timing of the nonbusy-season busy-hour study is dependent upon office characteristics. Any significant change in office characteristics necessitates a busy-hour study to ensure that the data being reported for engineering and administrative purposes are reflective of the true office busy hour.

**4.09** *Determination of when busy-hour studies will be conducted is made through agreement between the network administrator and the network design engineer.* The network administrator and the network design engineer should work together and discuss matters which not only pertain to busy-hour determination but those which are related to all office engineering and administrative concerns as well.

**4.10** As is true with other switching systems, data covering all *suspected* office busy periods are collected for review. *The hour with the highest average business-day usage is selected as the busy hour.* In the No. 2 ESS office, the busy hour data are collected by using the No. 2 ESS traffic measurements H-schedule. Details on busy-season determination are provided in Dial Facilities Management Practices, Division H, Section 1c(4), Busy Season Determination, and Division H, Section 10k, No. 2 ESS Job Sizing and Timing.

#### **IDLE-HOUR MEASUREMENTS**

**4.11** Idle-hour measurements are necessary in the development of the No. 2 ESS postcutover call processor capacity. Special effort should be made to obtain valid idle-hour readings. The specific traffic registers required for the call processor idle-hour studies are described in Dial Facilities Management Practices, Division H, Section 10h(2), Postcutover Call Processor Capacity.

**4.12** The idle-hour study requires data collection for five days during the four consecutive quarter-hours of the most-idle-hour of the day. The most-idle-hour is the hour during which the originating plus the incoming (O+I) calls are

regularly at a minimum. (This hour should correspond with the hour in which the sum of the four consecutive Q14 readings is regularly at a maximum.) The idle hour should be determined in the week before the actual idle-hour study. The choice of the idle hour to be studied must be discussed and coordinated among the network design, network administration, and maintenance groups. The idle-hour study must be conducted under several restrictions. Refer to Dial Facilities Management Practices, Division H, Section 10h(2), Postcutover Call Processor Capacity, for details on the idle-hour study restrictions.

#### **MACHINE CAPACITY DATA SOURCES**

**4.13** Line, trunk, and network data are necessary for making machine capacity studies. The line and trunk data are received as scheduled or requested from the responsible departments. The network data are the responsibility of the network administrator and the network design engineer. The data used in capacity studies include standard capacity tables, traffic measurements, and mechanized reports such as PATROL. A brief description of each of these data sources is given in (a) through (c) below.

(a) **Standard Capacity Tables:** Standard capacity tables are used when equipment quantities are engineered. These tables include the standard poisson capacity tables for blocking 1 out of 1000 calls, 1 out of 100 calls, and 1 out of 20 calls and are referred to as Table 1, Table 10, and Table 50, respectively. These tables are designed to limit occupancy over 100 servers. Additional information on the standard capacity tables is available in Traffic Facilities Practices, Division D, Section 1e, Poisson Capacity Tables.

(b) **Network Measurements:** Although various traffic and plant counts are available on several different schedules, the hourly busy-hour (H) schedule and quarter-hour (Q) schedule are of prime importance to machine capacity studies. The timing of these measurements is established on busy-hour and busy-season requirements. The measurements are requested by teletypewriter input messages or by traffic work table (TWT) assignments. Additional information on the format and use of these and other schedules is provided in Dial Facilities Management Practices, Division H, Section 10i, No. 2 ESS Traffic Measurements.

(c) **PATROL:** PATROL is a time-shared computer program that is available for use with the No. 2 ESS. This mechanized program has a unique combination of features which can be of significant use to the network administrator in performing machine capacity studies. PATROL assembles data that are inputted from the network teletypewriter's punched paper tape to a central computer. Using data that are gathered daily, the program can produce summaries for high-day and busy-season engineering. The machine load and service summary reports will provide calculations that include office totals and service-circuit calculations. A subroutine called capacity determination (CADET) is used for call processing capacity studies. The PATROL calculations include total usage (CCS), usage per main station (CCS/MS), percentage of overflow, percentage of occupancy, and percentage of capacity. Additional information on the PATROL system is available in Dial Facilities Management Practices, Division D, Section 1d(2), ESS Program for Administrative Reports On-Line (PATROL).

**5. CAPACITY CALCULATION SUMMARY**

**5.01** The network administrator's main responsibility is to ensure satisfactory customer service.

$$\frac{\text{Line TENS}}{100} \times \frac{\text{Derived Objective \% Line Fill}}{100} \times \text{Main Station/Working Line Ratio} = \text{Line Main-Station Capacity}$$

The three factors are discussed in 5.04 through 5.07.

**5.04** As a result of the folded nature of the No. 2 ESS switching machine, all lines, trunks, and service circuits terminate on terminal equipment

In order to accomplish this goal, the administrator must know how long the currently installed equipment will adequately serve customer demands and when relief is needed. Machine capacity is expressed in terms of the quantity of main stations that can be served without exceeding the criteria of good service.

**5.02** Generally, three broad areas are considered in the calculation of No. 2 ESS capacities. These areas are line and number capacities, control equipment (processor) capacities, and network (switching) equipment capacities. The capacity calculations which are necessary in each of these areas are discussed in 5.03 and 5.04.

**LINE AND NUMBER CAPACITY**

**A. Line Capacity**

**5.03** The main-station capacity based on lines is the maximum number of main stations that can be working on installed lines at the derived objective percentage of line fill for the No. 2 ESS machine. Main-station capacity based on lines can be expressed as the product of three factors as shown in the following equation:

numbers (TENS) at the combined distributing frame. For the purpose of this discussion, line TENS are defined as those TENS which are not used for trunks or service circuits. The concept of line TENS can be expressed by the following equation:

$$\text{Total Installed TENS} - \text{TENS Assigned to Trunks or Service Circuits} = \text{Line TENS}$$

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**5.05** The derived objective percentage of line fill is the calculated percentage of line TENS available for customer assignment; that is, the percentage of line TENS which is not used for

testing or as administrative spares. The derived objective percentage of line fill is expressed by the following equation:

$$\frac{\text{Line TENS} - \text{Line TENS Used for Testing or as Administrative Spares}}{\text{Line TENS}} \times 100 = \text{Derived Objective \% Line Fill}$$

**5.06** The main-station/working-line ratio is the ratio of main stations to the number of line

TENS used to serve them. This factor may therefore be expressed by the following equation:

$$\frac{\text{Total Main Stations}}{\text{Total Serving Line TENS}} = \text{Main-Station/Working-Line Ratio}$$

**5.07** Additional information and worksheets for line capacity determination are provided in Dial Facilities Management Practices, Division H, Section 1b(9), Determination of Line and Number Requirements.

that can be working on installed numbers at the derived objective percentage of number fill. Main-station capacity of directory numbers is computed in a manner similar to that used for determining the main-station capacity of lines (the main-station-per-line ratio is not a factor) and can be expressed by the following equation:

**B. Number Capacity**

**5.08** The main-station capacity of directory numbers is the maximum number of main stations

$$\frac{\text{Total Installed Numbers Available for Assignment}}{\text{Total Installed Numbers Available for Assignment}} \times \frac{\text{Derived Objective \% Number Fill}}{100} = \text{Number Main-Station Capacity}$$

The two factors are discussed in 5.09 through 5.11.

amount of trunk-assigned numbers will usually be minimal. The total installed numbers available for assignment can be expressed by the following equation:

**5.09** The total installed numbers available for assignment are those numbers which are not assigned to trunks. In a No. 2 ESS office the

$$\text{Total Installed Numbers} - \text{Numbers Assigned to Trunks} = \text{Total Installed Numbers Available for Assignment}$$

5.10 The derived objective percentage of number fill is the calculated percentage of numbers available for customer assignment. It provides for numbers which are administratively unusable because of intercept requirements, PBX or Centrex

growth, coin and official series, rate protection, and assignment lists. For the purpose of this discussion, these numbers are defined as administrative spares. The derived objective percentage of number fill may be expressed by the following equation:

$$\frac{\text{Total Installed Numbers Available for Assignment} - \text{Administrative Spares}}{\text{Total Installed Numbers Available for Assignment}} \times 100 = \text{Derived Objective \% Number fill}$$

The objective percentage of number fill may also be derived on an empirical basis by the network administrator.

5.11 In general, numbers are relatively inexpensive in ESS in comparison to the costs of other items. For this reason, an office should not normally be limited by numbers. Additional information and worksheets for number capacity calculations are provided in Dial Facilities Management Practices, Division H, Section 1b(9), Determination of Line and Number Requirements.

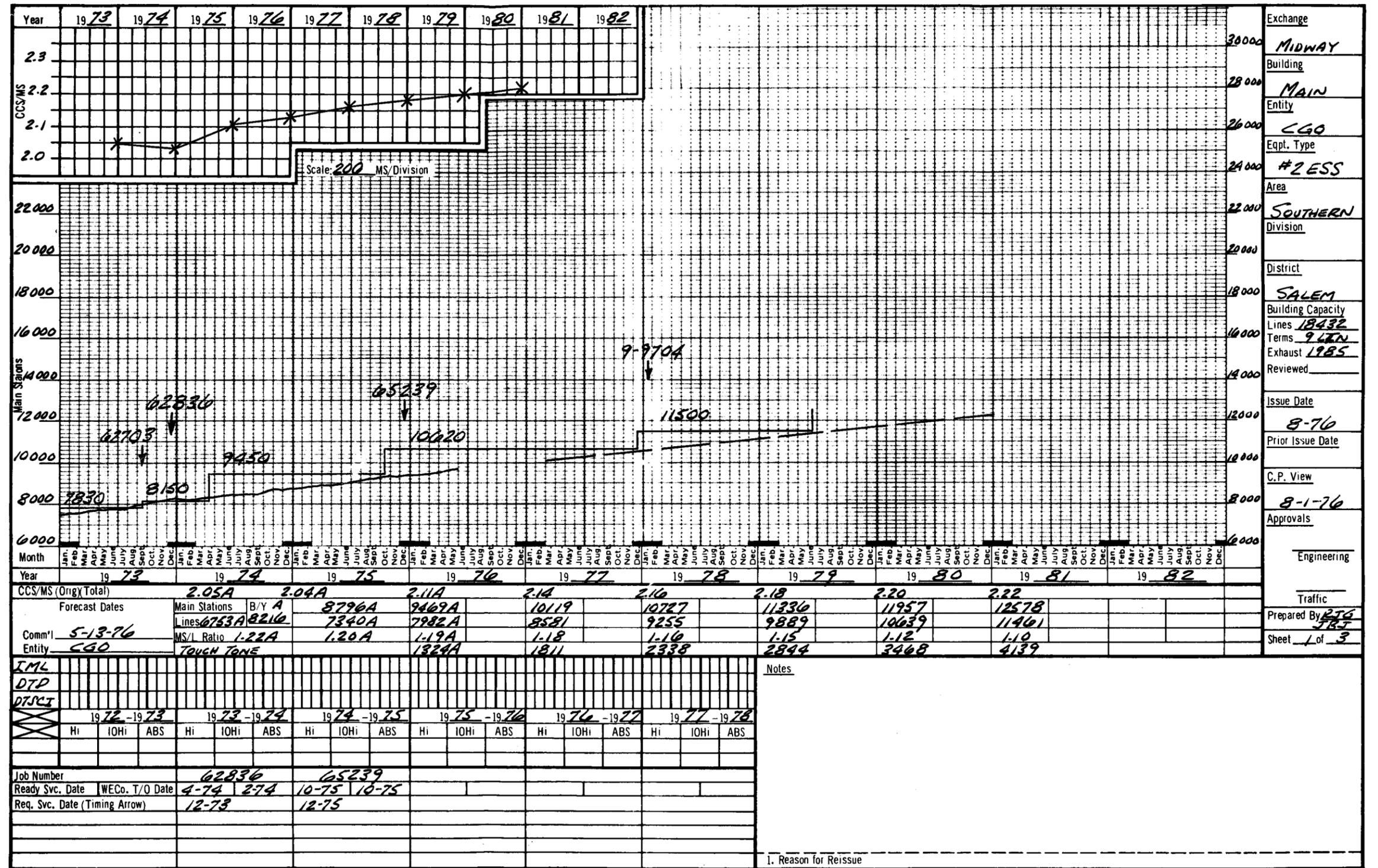
and call processor equipment. Capacity calculations for this equipment are provided in Dial Facilities Management Practices, Division H, Section 10h(2), Postcutover Call Processor Capacity, and Division H, Section 10h(3), Capacity Determination.

**NETWORK (SWITCHING) EQUIPMENT CAPACITY**

**CONTROL EQUIPMENT CAPACITY**

5.12 The No. 2 ESS network equipment includes the memory (program store and call store)

5.13 The No. 2 ESS network equipment includes service circuits, line trunk networks, junctors, and miscellaneous equipment. The capacity calculation information for this equipment is contained in Dial Facilities Management Practices, Division H, Section 10h(3), Capacity Determination.



DEMAND AND FACILITY CHART - PART A

Fig. 1—Demand and Facility Chart (Sheet 1 of 3)  
(3.03)

GENERAL														SUPPLEMENTAL INFO			Exchange				
Job Number or Capacity Adj.	62830	65239	9-9704											Dates	Numbers		MIDWAY				
Required Svc Date	12-73	1-76	1-78											Directory - JULY	NNX	Numbers					
Ready Svc. Date	4-74	10-75	12-77											TUR -	77-28000		Building				
Job Description - G.A. Repl., Other	REPL	GA	TRKS												77-97000		MAIN				
Main Station Capacity Displaced	355A (8150)	-	-														Entity				
Lines Displaced	355A (7200)	-	-														CGO				
Busy Season Prior to Exhaust	73-74	74-75	76-77																		
CAPACITY DATA														Inter-Office Transfers			Egpt. Type				
Capacity Added in Main Stations	Realized	Limiting SE Equip. Item	Added	Total	Added	Total	Added	Total	Added	Total	Added	Total	Added	Total	Added	Total	Added	Total			
		Switching Equipment CCS	10410	10410	1500	11910	-	11910													#2 ESS
		Talking Channel																			
		Lines	L	9450	9450	2050	11500	-	11500												
		Numbers																			
	Unrealized	Most Limiting	OFC	9450	9450	1170	10620	880	11500												
		Reason for TC Adjustment																			
		Centrex Capacity																			
		Change in TC CCS/MS																			
		Change in TC Design Crit.																			
Equipments	Numbers	Installed	15000	15000	-	15000	-	15000													
		Unavailable for Assignment																			
		% Fill Objective		90		90		90													
	Lines	Installed	LTV	10240	10240	2048	12288	-	12288												
		Unavailable for Assignment		921		1093		1093													
		% Fill Objective		95		95		95													
		Capacity of Lines (in Lines)		8853	-	10635	-	10635													
N.D. ORD. NO.	72-312	74-316																			
N.D. ORD. DUE/REC.	9-72	9-72	8-74	8-74	10-10-6																
WE ORD. DUE/REC.	11-72	11-72	11-74	11-74	1-22-7																
EQPT. SHIP	6-30-73	5-17-75	7-16-77																		
WE COMP	2-10-74	10-16-75	12-18-77																		
TT CAP	8000	8000	0	8000	0	8000															
Notes																					
1. Reason for re-issue																					
Approvals														Sheet 2 of 3							
Traffic Engineering														Prepared by RJG/LBJ							

DEMAND AND FACILITY CHART - PART B

Fig. 1—Demand and Facility Chart (Sheet 2 of 3) (3.03)

HISTORICAL DATA										OTHER FORECASTS					
Main Station Forecasts	Fcst Date	10-10-74	2-5-75	2-17-76	5-13-76						Type, Date				
	B/Y	11-27-74	7-22-75	11-20-75							B/Y	Demand	Cap	Demand	Cap
	1974	8242	8216A												
	1975	8841	<del>8216A</del> 8216A												
	1976	9430	9467	9469A											
	1977	10009	10003	10031	10119										
	1978	10619	10003	10599	10727										
	1979	11173	11198	11167	11336										
	1980		11767	11737	11957										
	1981			12307	12578										
ABS CCS/MS Forecasts (Orig.)	Fcst Date	1974	6-23-75	6-10-76							"AS ENGINEERED" DATA				
	B.S.	73-74	2-05A								Forecasts Used (Date)	Job No.			
		74-75	-	2-04A							M.S. Fcst				
		75-76	2-30	-	2-11A						Usage Fcst				
		76-77	2-33	2-12	2-14						Loc. Trk. Fcst				
		77-78	2-36	2-14	2-16						Toll Trk. Fcst				
		78-79	2-39	2-16	2-18						Months				
		79-80	2-42	2-18	2-20						By Seasons				
		80-81		2-20	2-22						Engineered Interval				
											Forecasts Used (Date)	Job No.			
										M.S. Fcst					
										Usage Fcst					
										Loc. Trk. Fcst					
										Toll Trk. Fcst					
										Months					
										By Seasons					
										Engineered Interval					

Type, Date  
B/Y

Demand Cap Demand Cap

Exchange **MIDWAY**

Building **MAIN**

Entity **CGO**

Equip. Type **#2ESS**

Issue Date **8-76**

Prepared by **RJG**  
**JBT**

Sheet **3** of **3**

NOTES

DEMAND AND FACILITY CHART - PART C

Fig. 1—Demand and Facility Chart (Sheet 3 of 3)  
(3.03)