SUBSCRIPTION CUSTOMER FEATURES - ESS* SWITCHES
NETWORK ADMINISTRATION AND LOADING PLANS

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1. GENERAL

1.01 This section contains suggested procedures for the network switching administrator (NSA) in managing certain customer features in 1/1A, 2/2B, and 3 ESS switches.

1.02 Whenever this section is reissued the reason(s) for reissue will be stated in this paragraph.

1.03 Part 2 of this section lists the features and provides a brief description. It also provides references for detailed description of the features.

1.04 Part 3 of this section covers the responsibilities of network administration and other managers relating to the loading and

administration of certain subscription customer features.

1.05 Part 4 of this section is an overview of the main traffic-sensitive equipment items affected by these services in ESS switches.

1.06 Part 5 describes data sources available for the determination of equipment capabilities in terms of these customer services.

2. CUSTOMER FEATURE DESCRIPTIONS

2.01 The customer features described herein are those services (with the exception of Speed Calling) requiring conference circuit use in 1/1A, 2/2B, and 3 ESS switches. These same services also involve various traffic - sensitive hardware/software that may create serving limitations for one specific service. Speed Calling services are primarily involved in storage limitations for the calling lists.

A. Subscription or Usage Sensitive Customer Services

2.02 Some of the customer services described in this section may be offered as subscription or usage - sensitive services. A subscription service is one for which a customer contracts for unlimited use of the service for a stated period of time (usually monthly). A usage - sensitive service is one for which the customer pays a given fee for each incidence of use of that service. The services described in this section relate only to those customer offerings by subscription. None of the services described for Centrex service are available in 3 ESS switches.

B. Universal Service Order Codes

2.03 Each customer service has a Universal Service Order Code (USOC) abbreviation as well as translation abbreviations that may vary among the types of ESS switches. Table A lists these codes by type ESS switch and by service. Some of the services are offered to the customer in packages, or combinations, of several services, presenting a data problem discussed in detail in Part 4 of this section.

C. Feature Listing and Brief Description

2.04 The following paragraphs briefly describe each feature. They may also serve as a list of features. See paragraphs 2.14 and 2.15 for detailed feature description references.

(1) **Call Forwarding Variable -**

2.05 This feature allows an individual line customer to have all incoming calls forwarded to another line regardless of the busy/idle status of the base station.

(2) **Call Forwarding - Busy Line**

2.06 This feature allows a customer to have all incoming calls forwarded to another line when the called line is busy. This feature is not available in 3 ESS.

(3) **Call Forwarding - Don't Answer**

2.07 This feature automatically routes incoming calls to another line when the called line does not answer. It is not available to an RSS customer or customers served by a 3 ESS.

(4) **Call Forwarding over Private Facilities**

2.08 This feature automatically routes incoming calls to another location over private facilities.

(5) **Call Waiting**

2.09 This feature informs the subscriber that an incoming call is waiting on the line. The notification is a burst of call waiting tone.

(6) **Call Hold**

2.10 This feature enables a CTX station user to hold any call in progress by flashing the switch hook and then dialing a code. The original connection can be retrieved by dialing the hold code a second time.

(7) **Three - Way Calling**

2.11 This feature allows a subscriber to establish a talking connection among himself and two other parties.

(8) Call Transfer

2.12 The Call Transfer feature encompasses a variety of transfer capabilities for CTX customers. Some of the features are available to the POTS Multi-line Variety Package in 1/1A ESS.

(9) Speed Calling

2.13 This Speed Calling feature allows a subscriber to assign 1-digit and/or 2-digit abbreviated codes to certain frequently called numbers.

D. Feature Detailed Description References

2.14 For more detailed descriptions of the services discussed in this section refer to the Feature Documents:

Switch	Section
1/1A ESS	231-090-ZZZ
1 ESS	231-190-ZZZ
1A ESS	231-390-ZZZ
2/2B ESS	232-190-ZZZ
3 ESS	233-190-ZZZ

2.15 For detailed information on translations refer to the Translation Guides for each of the switches:

Systems	Guide
1/1A ESS	TG-1A
2/2B ESS	TG-2H
3 ESS	TG-3

3. RESPONSIBILITIES

3.01 This section discusses the impact of customer services, described in part 2, on capacity setting, assignment, load balance, and the loading plans. The network administrator and traffic engineer have joint responsibilities in capacity setting for these services and the loading plans of switching entities offering these services. The network administrator has the responsibility for the assignment function and maintaining balanced loading in the switches on an ongoing basis.

3.02 The network administrator, the traffic engineer, and the marketing operation involved in forecasting the demand for these customer services are responsible for providing data necessary for the administration and planning strategy for these services. These data requirements are described in more detail in Part 5 of this section.

A. CAPACITY SETTING

3.03 Setting capacities for the customer services discussed in this section involves:

- Knowledge of the switching operations required to provide the studied customer service - particularly the traffic-sensitive hardware/software involved

- Knowledge of all the services using that traffic-sensitive hardware/software

- Knowledge of tariff structures involving package offerings

- Deciding which of the traffic-sensitive components could be a limiting factor for a service or group of services

- Obtaining the usage per main station (by the service(s)) on those traffic-sensitive components that are limiting factors

- Know the usage (Calls or CCS) capacity of the limiting factor components.

3.04 Capacity statements are based on the following general formula:

Capacity (in stations or users) =

Usage Capacity (Calls or CCS) of the traffic-sensitive component ÷ Usage per station or user.

3.05 Capacity statements for customer services are necessary in order to:

• Establish loading plans

• Monitor the assignment and growth of the services with reference to the loading plans

• Evaluate the timing and adequacy of relief jobs.

3.06 Using past busy season data, the NA prepares capacity statements for custom calling features for each ESS office. This information is used in preparing new or updating existing office loading plans. See Section 780-200-018.

3.07 Line and number administrators maintain a monthly in-service count of all customer calling features in their respective offices. These counts are used in varying combinations to update Central Office Equipment Reports (COER). The line and number administrator should provide this count to the Network Switch Administrator.

3.08 Detailed customer calling feature capacity determination procedures are contained in Section 231-070-615 (1/1A ESS), 232-070-236 (2/2B ESS), and 233-020-236 (3 ESS). These sections are planned to be written in 1985.

3.09 The NA must be aware of the customer calling feature capacities on an ongoing basis. For example, the individual feature capacities need to be reviewed in relationship to the individual feature demand at the exhaust of the current ESS job. The following paragraphs discuss capacity determination in single and multientity offices.

(1)   Single Entity Wire Center

3.10 In a single entity ESS wire center, customer calling feature demand can be determined from the General Planning Forecast (GPF) and from the Business/Residence Service Center centrex/forecast. Because demand generated from stimulation efforts may not be included in the current forecasts, it is necessary for the NA to be fully informed about proposed stimulation plans in each office. Information on the type and duration of stimulation campaigns planned, along with experience from previous campaigns, will aid the NA in estimating any probable increase in the forecasted customer calling feature demand.

3.11 If the projected demand for a given feature exceeds the calculated capacity before the end of the engineering period, the NA should estimate the month in which the feature will exhaust. Any exhaust date for a feature prior to the end of the engineering period should be discussed with the traffic engineer and the forces responsible for marketing the service.

(2)   Multientity Wire Center

3.12 Loading customer services in the switches of a multientity wire center presents a more complex situation. The same basic capacity determination approach is used for each entity in the wire center. However, the demand data usually encompasses the entire wire center. The demand for each service must be allocated to the individual entities of that wire center in accordance with the entity's serving capabilities and capacity. A general description of multientity loading plans can be found in Section 780-200-018.

3.13 The network administrator(s) responsible for a given wire center should work closely with the traffic engineer(s) in establishing and maintaining multientity office loading plans. The NA should be aware of the following custom calling feature related items:

(a)   Centrex customer feature demand. This will normally be stable and should be obtained from the Business/Residence Service Center centrex forecast with additional input from Business/Residence Service Center personnel.

(b)   Potential noncentrex customer feature candidates already served by ESS. These can be classified into two groups:

• Those customers without any features (for initial sales contact)

• Those customers with features (for follow-up sales efforts).

(c)   Remaining capacity for potential noncentrex customer feature candidates to establish limits on stimulation efforts. In multientity wire centers, a great deal of customer feature

inward movement can be generated by customers taking number changes from an electromechanical office into an ESS.

(d) Ongoing and proposed Business/Residence Service Center and Installation stimulation campaigns. If individual customer feature capacities permit, the network administrator can direct sales efforts in the right direction. The network administrator will know which customer features can be sold and for how long.

3.14 The network administrator, the line and number administrator, and the traffic engineer should be constantly aware of the customer feature capacities as they relate to the multientity loading plan. Effective loading plans assure maximum revenue from customer features consistent with capital expenditure and service objectives.

B. MONITORING LOADING PLANS

3.15 The line and number administrator should track the projected customer feature growth versus actual growth. Actual custom calling feature main station figures should be compared to the forecasted demand.

3.16 Forecasts, loading plans, and other related documents for each office should be retained by the network administrator.

3.17 Monitoring of customer feature load balance is important. The network administrator, in either a mechanized or manual line assignment mode, will be unable to control the loading of custom calling features. The line and number administrator must be especially watchful of balance and blockage indicators and take corrective action where indicated.

3.18 Where tracking indicates substantial deviation from the existing loading plan, a new loading plan should be developed.

C. EVALUATING RELIEF JOBS

3.19 When reviewing relief jobs with the traffic engineer, the provisions for the

hardware/software required for forecasted customer features should be validated for adequacy. The capacity setting procedures discussed earlier in this part will be used for this validation.

4. TRAFFIC-SENSITIVE COMPONENTS

4.01 Specific hardware/software components used by the customer features described in this section vary among the ESS switch types. However, there is a commonality of component function required by the same service in each switch type.

4.02 All the customer features described herein require memory allocation. Permanent type memory is required to establish the feature in the switch and its basic parameters. Translation type memory is required to establish the feature for a given customer. Parameter type memory is required to provide the location of the traffic-sensitive software components used by a customer service. Temporary type memory (recent change areas) is required for customer changeable services, especially CTX services and Speed Calling.

4.03 Hardware circuits permitting multiple connections, such as conference circuits, are required for services such as call waiting and three-way calling.

4.04 Special ringing circuits and tone circuits are required for services such as call forwarding and call waiting.

4.05 In determining the components sensitive to a given service, the Feature Document for that service should be referenced. A list of the Feature Document series for 1/1A, 2/2B, and 3 ESS switches can be found in paragraph 2.22.

5. DATA COLLECTION

5.01 The data collection procedures will vary among the 1/1A, 2, and 3 ESS. However, there are common elements among the switches. Generally speaking, the following data should be collected for customer feature capacity determination.

(a) Forecasts - demand for each service to be studied and each service affecting the limiting hardware/software component.

(b) Traffic measurements - peg count, overflow, and usage data for each service studied and for each of the components that may be a limiting factor.

(c) Working main stations - The number of main stations of customers subscribing to the studied services during the period(s) that traffic measurements are made for the study.

(d) In-service quantities (less service protection margin) for each component, hardware or software, that may be a limiting factor for the studied services.

(e) Engineering criterion - for each of the hardware/software components that may be a limiting factor.

5.02 Forecasts of demand for the studied services may be obtained as described in paragraphs 3.10 and 3.15. The forecasts should cover a period one busy season in advance and one busy season beyond the study period, as well as the studied period.

5.03 Forecasts of demand will usually be stated in terms of subscription to a single service or packages of several services, as shown in the company's tariff structure. For instance, a combination call waiting, call forwarding, and three-way calling may be offered as a package. Subscribers with this package service should be counted three times for main station summation for each service; once for call waiting, once for call forwarding, and once for three-way calling.

5.04 Traffic measurements for all data should be scheduled for the busy hour of each service as well as for the busy hour of the limiting component. In turn, limiting component data should be collected in each service busy hour. For example, the 3-port conference circuit busy hour may now be a morning busy hour, CTX three-way calling has a morning busy hour, and POTS three-way calling has an evening busy hour. Forecasts indicate that

CTX growth is static and POTS three-way calling has expected rapid growth and increased usage. In order to determine the capacity for these services, assuming the 3-port conference circuits are the limiting factor, the three-way calling usage for POTS and CTX would have to be forecasted for both the morning and evening hours to determine proper capacities for these services. The busy hour of the limiting component may change to evening.

5.05 Statements of working main stations for each of the studied services should be maintained monthly by the network administrator for input to the Office Description File (ODF) of the Stored Program Control Systems - Central Office Equipment Reports (SPCS-COER).

5.06 The statements of working main stations for the ODF must take into consideration the package service offerings. Subscribers to these packages should be counted once for each service included in the package as described in paragraph 5.03.

5.07 In-service quantities of hardware/software components involved in the study can be obtained from the traffic engineering.

5.08 Engineering criterion for a studies component is available from the traffic engineer.

5.09 Certain limiting components may be used by services other than the studied customer service(s). When this is the case, forecasts and traffic measurements for these other services must be obtained.

TABLE A. CODES FOR SUBSCRIPTION CUSTOMER SERVICES (Sheet 1 of 2)

	TRANSLATION CODE			
SERVICE	1/1A ESS*	2/2B ESS	3 ESS	USOC
POTS Ø				
Call Forwarding				
Variable	CFD	CFV	ESM	ESM
Busy Line	CFBL	-	-	EVB
Don't Answer	CFDA	-	-	EVD
Call Waiting				
Terminating	CWT	CWT	ESX	ESX
Cancel	CCW	-	-	
Three-way Calling	TWC	TW3(ADO)	ESC	ESC
Speed Calling				
1 Digit	SC1	SC1	ESL	ESL
2 Digits	SC2	SC2	ESF	ESF
Group	SC	SC	-	GSC
Customer Changeable 1	CSC1	CH1	CHL	E8C
Customer Changeable 2	CSC2	CH2	CHF	E3D
CTX				
Call Forwarding				
Variable	CFD	CFV	-	EAT
Busy Line	CFBL	CFB	-	CFBD
Don't Answer	CFDA	CFD	-	E9G
Over Private Facilities	CFPF	-	-	
Call Waiting				
Terminating	CWT	CWT-Incoming	-	CWTD
Intragroup		CWA-All Calls	-	CWTU
Originating	CWO	CWO	-	ESZ
Cancel	CCW	-		
Call Hold	CHD	CHD	-	CHD
Three-Way Calling	TWC	TW3	-	ESC
Call Transfer				
Unlimited (All Calls)	CTU	TW3	-	EGF
Individual	CTI	TW2	-	

TABLE A. (Cont'd) (Sheet 2 of 2)

| | TRANSLATION CODE | | | |
SERVICE	1/1A ESS*	2/2B ESS	3 ESS	USOC
Attendant	CTA	TW1		
Outgoing (with CTU or CTI)	CTO	-	-	
Speed Calling				
1 Digit	SC1	SC1	-	ESL
2 Digits	SC2	SC2	-	ESF
Group	SC	SC	-	GSC
Attendant	-	ASC	-	E2G
Customer Changeable 1	CSC1	CH1	-	ESHC6
Customer Changeable 2	CSC2	CH2	-	ESHC3
RSS				
Call Forwarding				
Variable	CFD	CFV	-	ESM
Busy Line	CFBL	CFB	-	EVB
Call Waiting				
Terminating	CWT	CWT	-	ESX
Three-Way Calling	TWC	TW3	-	ESC
Speed Calling				
1 Digit	SC1	SC1	-	ESL
2 Digits	SC2	SC2	-	ESF
Customer Changeable 1	CSC1	CH1	-	E8C
Customer Changeable 2	CSC2	CH2	-	E3D

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++∅ Does not include MultiHunt Variety Package (MVP).