"DIMENSION®" 600/2000/CUSTOM PBX

BUSINESS SERVICES DESIGN ENGINEERING

DESIGN ENGINEERING WORKSHEETS

1. GENERAL

1.01 This section contains the Design Engineering Worksheets for determining the hardware and software requirements for various DIMENSION 600/2000/Custom PBX equipment configurations. The instructional text associated with these worksheets can be found in the following:

- Section 554-111-605, Basic Traffic Data and Trunk Summary (Worksheet 1)

- Section 554-111-610, Originating Register Record / TOUCH-TONE® Receiver/Sender Engineering (Worksheet 2)

- Section 554-111-615, Time Division Network Engineering (Worksheet 3)

- Section 554-111-620, Station Message Detail Recording Engineering (Worksheet 4)

- Section 554-111-625, Electronic Custom Telephone Service Engineering (Worksheet 5)

- Section 554-111-630, Processor Community Engineering (Worksheets 6, 7, and 8)

- Section 554-111-635, Centralized Attendant Service, Direct Department Calling, Uniform Call Distribution, and Attendant Position Engineering (Worksheets 9, 10, and 11)

- Section 554-111-636, Automatic Call Distribution and Enhanced Uniform Call Distribution Engineering (Worksheet 12).

These texts contain important supportive information to the worksheets such as guidelines for deter-mining trunk quantities and evaluating processor occupancy.

1.02 The reasons for reissuing this section are listed below. Since this reissue is a general revision, no revision arrows have been used to denote significant changes.

(a) Add Worksheet 5, ECTS Engineering

(b) Add Worksheet 12, ACD and Enhanced UCD Engineering

(c) Add revised Worksheet 7.1, Memory Configuration.

1.03 As new DIMENSION 600/2000/Custom PBX sections are written and existing ones revised, the associated worksheet(s) will be incorporated into this section. Also, should any existing worksheet(s) require modification, the revised worksheet(s) will first be updated in this section followed by the necessary revision to the instructional text. Therefore, the worksheets found in this section will be the most current available for engineering a DIMENSION 600/2000/Custom PBX.

1.04 References in this section to methods, planning, data requirements, service levels, and equipment quantities are based on American Telephone and Telegraph Company requirements.

1.05 Recommendations for changes to this section should be submitted on Form E-3973 as specified in Section 000-010-015, How To Comment on Bell System Practices.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 1 — BASIC TRAFFIC DATA AND TRUNK SUMMARY

1.1 Basic Traffic Data

INTERCOM			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			Station to Attendant				
Trunk Type Code	100		Station to Station				
DAC or Trunk ID			Other	1			
Service Level							
Trunk Level							
Overflow Group							
ECCS			TOTAL				

APLT			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			APLT to Station				
Trunk Type Code			APLT to Attendant				
DAC or Trunk ID			APLT to UCD				
Service Level			APLT to DDC				
Trunk Level			Other	1			
Overflow Group			Total In on 2-Way APLT				
ECCS			Station to APLT				
TOUCH-TONE Dialing In			Attendant to APLT				
Out			Tie to APLT	2			
SMDR			Other	1			
OTQ			Total Out on 2-Way APLT				
			TOTAL				

DID			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			DID to Station				
Trunk Type Code			DID to LDN				
DAC or Trunk ID			DID to UCD	3			
Service Level			DID to DDC	3			
Trunk Level			Other	1			
Overflow Group							
ECCS							
TOUCH-TONE Dialing In							
SMDR							
			TOTAL				

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 1 – BASIC TRAFFIC DATA AND TRUNK SUMMARY

1.1 Basic Traffic Data (Contd)

1-WAY IN CO			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			CO to Station (via Attendant)				
Trunk Type Code							
DAC or Trunk ID			CO to Attendant				
Service Level			CO to UCD				
Trunk Level			CO to DDC				
Overflow Group			Other	1			
ECCS							
SMDR			TOTAL				

1-WAY OUT CO			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			Station to CO				
Trunk Type Code			Attendant to CO				
DAC or Trunk ID			Tie to CO	2			
Service Level			Other	1			
Trunk Level							
Overflow Group							
ECCS							
TOUCH-TONE Dialing In							
Out							
SMDR							
OTQ			TOTAL				

2-WAY CO			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			CO to Station				
Trunk Type Code			CO to Attendant				
DAC or Trunk ID			CO to UCD				
Service Level			CO to DDC				
Trunk Level							
Overflow Group			Station to CO				
ECCS			Attendant to CO				
TOUCH-TONE Dialing Out			Tie to CO	2			
			Other	1			
SMDR							
			TOTAL				

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 1 — BASIC TRAFFIC DATA AND TRUNK SUMMARY

1.1 Basic Traffic Data (Contd)

1-WAY IN FX			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			FX to Station (via Attendant)				
Trunk Type Code	21						
DAC or Trunk ID			FX to Attendant				
Service Level			FX to UCD				
Trunk Level			FX to DDC				
Overflow Group			Other	1			
ECCS							
SMDR			TOTAL			

1-WAY OUT FX			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			Station to FX				
Trunk Type Code			Attendant to FX				
DAC or Trunk ID			Tie to FX	2			
Service Level			Other	1			
Trunk Level							
Overflow Group							
ECCS							
TOUCH-TONE Dialing In							
Out							
SMDR							
OTQ			TOTAL			

2-WAY FX			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			FX to Station				
Trunk Type Code			FX to Attendant				
DAC or Trunk ID			FX to UCD				
Service Level			FX to DDC				
Trunk Level							
Overflow Group			Station to FX				
ECCS			Attendant to FX				
TOUCH-TONE Dialing Out			Tie to FX	2			
			Other	1			
SMDR							
OTQ			TOTAL			

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 1 — BASIC TRAFFIC DATA AND TRUNK SUMMARY

1.1 Basic Traffic Data (Contd)

800 SERVICE			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			WATS to Station				
			WATS to Attendant				
Trunk Type Code			WATS to UCD				
DAC or Trunk ID			WATS to DDC				
			Other	1			
Service Level							
Trunk Level							
Overflow Group							
ECCS							
SMDR			TOTAL				

OUTWATS			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			Station to WATS				
			Attendant to WATS				
Trunk Type Code			Tie to WATS	2			
DAC or Trunk ID			Other	1			
Service Level							
Trunk Level							
Overflow Group							
ECCS							
TOUCH-TONE Dialing Out							
SMDR							
OTQ			TOTAL				

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 1 — BASIC TRAFFIC DATA AND TRUNK SUMMARY

1.1 Basic Traffic Data (Contd)

1-WAY IN TIE			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			TIE to Station				
Trunk Type Code			TIE to Attendant				
DAC or Trunk ID			TIE to UCD				
Service Level			TIE to DDC				
Trunk Level			TIE to CO	2			
Overflow Group			TIE to FX	2			
ECCS			TIE to WATS	2			
TOUCH-TONE Dialing In			TIE to APLT	2			
SMDR			TIE to Tie	2			
			Other	1			
			TOTAL				

1-WAY OUT TIE			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			Station to TIE				
Trunk Type Code			Attendant to TIE				
DAC or Trunk ID			Tie to TIE	2			
Service Level			Other	1			
Trunk Level							
Overflow Group							
ECCS							
TOUCH-TONE Dialing Out							
SMDR							
OTQ			TOTAL				

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 1 — BASIC TRAFFIC DATA AND TRUNK SUMMARY

1.1 Basic Traffic Data (Contd)

2-WAY TIE			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			TIE to Station				
Trunk Type Code			TIE to Attendant				
DAC or Trunk ID			TIE to UCD				
Service Level			TIE to DDC				
Trunk Level			TIE to CO	2			
Overflow Group			TIE to FX	2			
ECCS			TIE to WATS	2			
TOUCH-TONE Dialing In			TIE to APLT	2			
Out			TIE to TIE	2			
SMDR			TOTAL				
OTQ			Station to TIE				
			Attendant to TIE				
			TIE to TIE	2			
			Other	1			
			TOTAL				
			TOTAL			⊠	

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 1 — BASIC TRAFFIC DATA AND TRUNK SUMMARY

1.1 Basic Traffic Data (Contd)

2-WAY PC/2-WAY RO			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			AUTOVON Attendant to PC				
Trunk Type Code	15		AUTOVON PC to Station				
DAC or Trunk ID			AUTOVON PC to Attendant				
Service Level			TOTAL 2-Way PC				
Trunk Level							
Overflow Group			AUTOVON Station to RO				
ECCS			AUTOVON Attendant to RO				
TOUCH-TONE Dialing In			AUTOVON RO to Station				
Out			AUTOVON RO to Attendant				
SMDR							
OTQ							
			TOTAL 2-Way RO				

1-WAY IN LDN			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			AUTOVON Attendant to Station				
Trunk Type Code	39						
DAC or Trunk ID							
Service Level							
Trunk Level							
Overflow Group							
ECCS							
TOUCH-TONE Dialing In							
Out							
SMDR							
			TOTAL				

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 1 — BASIC TRAFFIC DATA AND TRUNK SUMMARY

1.1 Basic Traffic Data (Contd)

1-WAY OUT ATNDT			CALL TYPE	NOTE	GROUP BUSY HOUR		
					CALLS	HT	CCS
Reference Number			AUTOVON Station to Attendant				
Trunk Type Code	39						
DAC or Trunk ID							
Service Level							
Trunk Level							
Overflow Group							
ECCS							
TOUCH-TONE Dialing Out							
SMDR							
OTQ			TOTAL			⊠	

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 1 — BASIC TRAFFIC DATA AND TRUNK SUMMARY

1.1 Basic Traffic Data (Contd)

TRUNK TYPE	REFERENCE NUMBER	TRUNK TYPE CODE	DAC OR TRUNK ID	SERVICE LEVEL	"TOUCH-TONE" DIALING IN	OUT	SMDR	OTQ	CALL TYPE	NOTE	GROUP BUSY HOUR CALLS	HT	CCS
Remote Access		50							Remote Access (Dedicated) TOTAL				
Dictation		51							Station to Dictation TOTAL	4			
Page		54							Station to Page				
									Attendant to Page				
									TOTAL				
Toll Term		60							Station to Toll Term TOTAL				
Music-on-Hold		62							Music-on-Hold TOTAL				
Conference		5							Attendant Conference TOTAL				
Release Link Traffic		57							Release Link Traffic TOTAL	5			

MISCELLANEOUS TRUNK TYPES

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 1 — BASIC TRAFFIC DATA AND TRUNK SUMMARY

1.1 Basic Traffic Data (Contd)

Notes:

1. Other call types for each trunk group are listed on the chart. Data, if available, for each call type can be listed individually on the worksheet or in some cases lumped together and entered in the appropriate trunk group's mini-worksheet.

2. Tandem Traffic: These call types are considered tandem call types. Tandem traffic is counted only once. Facility traffic is twice the PBX offered load due to tandeming. These call types should be subtracted prior to network, processor, and register/receiver calculations.

3. UCD/DDC: When UCD/DDC traffic is intermingled with normal DID traffic incoming to the PBX, the UCD/DDC group traffic should not be included in the normal DID incoming load on the Basic Traffic Data Summary Worksheet. The amount of facilities required for UCD/DDC traffic is determined in Section 554-111-635 and then added to the number of DID trunks required for normal DID traffic.

4. Dictation: A TOUCH-TONE dialing receiver is dedicated to each dictation connection for the duration of the connection to allow TOUCH-TONE dialing signals to be converted to dial pulses internally.

5. Release Link Trunk: Release Link Trunk (RLT) traffic CCS should not be added to the total network CCS since it is already included in the total incoming CO trunk CCS.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 1 — BASIC TRAFFIC DATA AND TRUNK SUMMARY

1.2 Trunk Data Summary

TRUNK TYPE SUMMARY

REFERENCE NUMBER	TRUNK TYPE	TRUNK RECORDS REQUIRED	QUEUE RECORDS REQUIRED	QUEUE BLOCKING PROBABILITY	QUEUE MEAN WAIT

*TOTAL TRUNK RECORDS FOR SYSTEM =

Trunk Records (Actual) + Total Originating
Register Records + Total Console Switched
Loop Records + One Dummy Head Address

OPX TRUNK SUMMARY

OPX GROUP NUMBER	DIAL ACCESS CODE	NUMBER OF OPXs IN EACH GROUP
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

TOTALS CHART

	TOTALS TRUNK SUMMARY	ENTIRE SYSTEM QTY.	SUBNETWORK 00	01	02	03	04
1	CO, FX, WATS						
2	REMOTE ACCESS						
3	DID						
4	AUX TRK INTERFACE						
5	RLTs						
6	TIE, APLT, AUTOVON						
7	OPXs						
8	Physical Trunk Records		//	//	//	//	//
9	Trunk Groups (includes OPX)		//	//	//	//	//
10	Outgoing Trunk Queue Groups		//	//	//	//	//
11	Outgoing Trunk Queue Records		//	//	//	//	//
12	INTERCOM Record		//	//	//	//	//
13	Trunk Records (Actual)		//	//	//	//	//
14	TOTAL TRUNK RECORDS (SYSTEM)*		//	//	//	//	//

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 2 — REGISTER/RECEIVER/SENDER SIZING

	TRUNK GROUP/CALL TYPE	NOTE	DIG. INTO OR	DP OR RECORDS			"TT" REG/RCVR			DIG. SENT	"TOUCH-TONE" SENDERS		
				CALLS	HT	CCS	CALLS	HT	CCS		CALLS	HT	CCS
I N T E R C O M	STA TO STA	1											
	STA TO ATND												
	OTHER												
A P L T	APLT TO STA	1											
		2											
	APLT TO TIE	3											
	STA TO APLT												
	TIE TO APLT	3											
	OTHER												
D I D	DID TO STA	1											
		2											
	OTHER												
	PAGE 1 TOTALS												

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 2 — REGISTER/RECEIVER/SENDER SIZING

TRUNK GROUP/CALL TYPE		NOTE	DIG. INTO OR	DP OR RECORDS			"TT" REG/RCVR			DIG. SENT	"TOUCH-TONE" SENDERS		
				CALLS	HT	CCS	CALLS	HT	CCS		CALLS	HT	CCS
1-W OUT CO	STA TO CO	1											
	TIE TO CO	3											
	OTHER												
2-WAY CO	STA TO CO	1											
	TIE TO CO	3											
	OTHER												
1-W OUT FX	STA TO FX	1											
	TIE TO FX	3											
	OTHER												
	PAGE 2 TOTALS												

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 2 — REGISTER/RECEIVER/SENDER SIZING

TRUNK GROUP/CALL TYPE		NOTE	DIG. INTO OR	DP OR RECORDS			"TT" REG/RCVR			DIG. SENT	"TOUCH-TONE" SENDERS		
				CALLS	HT	CCS	CALLS	HT	CCS		CALLS	HT	CCS
2-WAY FX	STA TO FX	1											
	TIE TO FX	3											
	OTHER												
OUT WATS	STA TO WATS	1											
	TIE TO WATS	3											
	OTHER												
1-W OUT TIE	STA TO TIE	1											
	TIE TO TIE	3											
	OTHER												
PAGE 3 TOTALS													

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 2 — REGISTER/RECEIVER/SENDER SIZING

TRUNK GROUP/CALL TYPE		NOTE	DIG. INTO OR	DP OR RECORDS			"TT" REG/RCVR			DIG. SENT	"TOUCH-TONE" SENDERS		
				CALLS	HT	CCS	CALLS	HT	CCS		CALLS	HT	CCS
1-W INC TIE	TIE TO STA	1											
	TIE TO TIE	3											
	TIE TO CO	3											
	OTHER												
2-WAY TIE	TIE TO STA	1											
	TIE TO TIE	3											
	TIE TO CO	3											
	STA TO TIE												
	OTHER												
PAGE 4 TOTALS													

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 2 — REGISTER/RECEIVER/SENDER SIZING

	TRUNK GROUP/CALL TYPE	NOTE	DIG. INTO OR	DP OR RECORDS			"TT" REG/RCVR			DIG. SENT	"TOUCH-TONE" SENDERS		
				CALLS	HT	CCS	CALLS	HT	CCS		CALLS	HT	CCS
A U T O V O N 2-W PC RO	AUTOVON PRECEDENCE CAPABLE TO STATION	1											
	AUTOVON PRECEDENCE CAPABLE TO ATNDT												
	AUTOVON ROUTINE ONLY TO STATION												
	AUTOVON ROUTINE ONLY TO ATNDT												
	AUTOVON STATION TO ROUTINE ONLY												
R E M O T E A C C E S S	REMOTE ACCESS TO TIE	3,4											
	REMOTE ACCESS TO WATS	3											
	REMOTE ACCESS TO FX	3											
	REMOTE ACCESS TO CO	3											
	OTHER												
	PAGE 5 TOTALS												

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 2 — REGISTER/RECEIVER/SENDER SIZING

TRUNK GROUP/CALL TYPE			NOTE	DIG. INTO OR	DP OR RECORDS			"TT" REG/RCVR			DIG. SENT	"TOUCH-TONE" SENDERS		
					CALLS	HT	CCS	CALLS	HT	CCS		CALLS	HT	CCS
M I S C	PAGE													
	DICTATION		5											
	TOLL TERM.													
	RLT (BRANCH)		6											
	PAGE 6 TOTALS													

TOTALS SUMMARY

	NOTE	DP OR CCS	"TT" REG/RCVR CCS	"TT" SENDER CCS
PAGE 1 TOTAL				
PAGE 2 TOTAL				
PAGE 3 TOTAL				
PAGE 4 TOTAL				
PAGE 5 TOTAL				
PAGE 6 TOTAL				
GRAND TOTAL				
TANDEM CCS ÷ 2	7			
ADJUSTED CCS				
20% OF REG CCS	8			
15% OF SENDER CCS	9			
ENGINEERED CCS	10			

DP OR RECORDS REQUIRED	
"TT" RCD/RCVR REQUIRED	
"TT" SENDERS REQUIRED	
LC10C CIRCUIT PACKS	
LC12 CIRCUIT PACKS	

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 2 — REGISTER/RECEIVER/SENDER SIZING

Notes:

1. Extra lines are provided to accomodate different quantities of digits dialed for certain call types. Extra lines may be used for entering call types that are not listed specifically.

2. DID and APLT trunks normally use dial pulse originating register records, but may be assigned a class of service to permit the use of TOUCH-TONE dialing receivers and OR records if required.

3. These are tandem traffic calls. Tandem traffic must be subtracted prior to final calculations. Threeway station calls are considered tandem traffic calls.

4. Remote access calls must always use TOUCH-TONE dialing.

5. For dictation, a TOUCH-TONE dialing register/receiver will stay up for the duration of the connection. Do not include the CCS for dictation if external TOUCH-TONE dialing signaling conversion is used.

6. Release link trunk (RLT) traffic will use a TOUCH-TONE dialing register/receiver at the branch when the CAS attendant completes the call over the RLT back to the branch. For TOUCH-TONE dialing receiver CCS, take 25 percent of the total RLT trunk group CCS on the Basic Traffic Data Summary Miniworksheet.

7. These are tandem traffic calls. Total all CCS for call types that have a Note 3 in the Note column as well as any "other" call types involving a trunk-to-trunk connection. Divide the total by 2.

8. For dial pulse records and TOUCH-TONE dialing receivers, the appropriate adjusted CCS pool requirement is multiplied by 1.20 (20 percent) to account for false starts, busy, attendant 2-port usage, and feature usage to obtain the actual CCS pool requirement.

9. For TOUCH-TONE dialing senders, the total TOUCH-TONE dialing sender CCS is multiplied by 1.15 (15 percent) to account for abandoned calls, busy, attendant usage, and features to obtain the actual TOUCH-TONE dialing sender pool requirement.

10. These actual CCS totals are read into Table H to determine the quantity of DP OR records, TOUCH-TONE dialing receivers, and TOUCH-TONE dialing senders required.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 3 - NETWORK MODULE AND LINK SIZING

3.1 SUMMARY OF TRUNK DATA

3.1.1 ONE-WAY INCOMING FROM COs

A	B	C	D	E	F	G	H	I	J	K	L	M	N
GROUP DESCRIPTION	GROUP NO.	TRUNK TYPE	WORKING TRUNKS	TOTAL CARRIED CCS	CCS PER TRUNK (E÷D)	INC CCS	INC CCS THAT TANDEM	INC CCS THAT TERMINATE IN PBX	OUT CCS	LINK PROBTY INC	LINK PROBTY OUT	LINK CCS INC	LINK CCS OUT
TOTAL TRK GROUPS													
TOTAL TRUNKS													
TOTAL CCS													

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 3 - NETWORK MODULE AND LINK SIZING

3.1 SUMMARY OF TRUNK DATA

   3.1.2 ONE-WAY OUTGOING TO COs

A	B	C	D	E	F	G	H	I	J	K	L	M	N
GROUP DESCRIPTION	GROUP NO.	TRUNK TYPE	WORKING TRUNKS	TOTAL CARRIED CCS	CCS PER TRUNK (E÷D)	INC CCS	INC CCS THAT TANDEM	INC CCS THAT TERMINATE IN PBX	OUT CCS	LINK PROBTY INC	LINK PROBTY OUT	LINK CCS INC	LINK CCS OUT
TOTAL TRK GROUPS													
TOTAL TRUNKS													
TOTAL CCS													

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 3 - NETWORK MODULE AND LINK SIZING

3.1 SUMMARY OF TRUNK DATA

3.1.3 TWO-WAY CO TRUNKS

A	B	C	D	E	F	G	H	I	J	K	L	M	N
GROUP DESCRIPTION	GROUP NO.	TRUNK TYPE	WORKING TRUNKS	TOTAL CARRIED CCS	CCS PER TRUNK (E÷D)	INC CCS	INC CCS THAT TANDEM	INC CCS THAT TERMINATE IN PBX	OUT CCS	LINK PROBTY INC	LINK PROBTY OUT	LINK CCS INC	LINK CCS OUT
TOTAL TRK GROUPS													
TOTAL TRUNKS													
TOTAL CCS													

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 3 - NETWORK MODULE AND LINK SIZING

3.1 SUMMARY OF TRUNK DATA

3.1.4 ONE-WAY INCOMING TIE LINES

A	B	C	D	E	F	G	H	I	J	K	L	M	N
GROUP DESCRIPTION	GROUP NO.	TRUNK TYPE	WORKING TRUNKS	TOTAL CARRIED CCS	CCS PER TRUNK (E÷D)	INC CCS	INC CCS THAT TANDEM	INC CCS THAT TERMINATE IN PBX	OUT CCS	LINK PROBTY INC	LINK PROBTY OUT	LINK CCS INC	LINK CCS OUT
TOTAL TRK GROUPS													
TOTAL TRUNKS													
TOTAL CCS													

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 3 - NETWORK MODULE AND LINK SIZING

3.1 SUMMARY OF TRUNK DATA

3.1.5 ONE-WAY OUTGOING TIE LINES

A	B	C	D	E	F	G	H	I	J	K	L	M	N
GROUP DESCRIPTION	GROUP NO.	TRUNK TYPE	WORKING TRUNKS	TOTAL CARRIED CCS	CCS PER TRUNK (E÷D)	INC CCS	INC CCS THAT TANDEM	INC CCS THAT TERMINATE IN PBX	OUT CCS	LINK PROBTY INC	LINK PROBTY OUT	LINK CCS INC	LINK CCS OUT
TOTAL TRK GROUPS													
TOTAL TRUNKS													
TOTAL CCS													

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 3 - NETWORK MODULE AND LINK SIZING

3.1 SUMMARY OF TRUNK DATA

3.1.6 TWO-WAY TIE LINES

A	B	C	D	E	F	G	H	I	J	K	L	M	N
GROUP DESCRIPTION	GROUP NO.	TRUNK TYPE	WORKING TRUNKS	TOTAL CARRIED CCS	CCS PER TRUNK (E÷D)	INC CCS	INC CCS THAT TANDEM	INC CCS THAT TERMINATE IN PBX	OUT CCS	LINK PROBTY INC	LINK PROBTY OUT	LINK CCS INC	LINK CCS OUT
TOTAL TRK GROUPS													
TOTAL TRUNKS													
TOTAL CCS													

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 3 - NETWORK MODULE AND LINK SIZING

3.1 SUMMARY OF TRUNK DATA

3.1.7 INTERCOM MISCELLANEOUS

A	B	C	D	E	F	G	H	I	J	K	L	M	N
GROUP DESCRIPTION	GROUP NO.	TRUNK TYPE	WORKING TRUNKS	TOTAL CARRIED CCS	CCS PER TRUNK (E÷D)	INC CCS	INC CCS THAT TANDEM	INC CCS THAT TERMINATE IN PBX	OUT CCS	LINK PROBTY INC	LINK PROBTY OUT	LINK CCS INC	LINK CCS OUT
INTERCOM (NOTE 1)													
"TT" REGISTER (NOTE 2)													
"TT" SENDER (NOTE 2)													
LC361 TRK GRP (NOTE 3)													
"DP" REGISTER (NOTE 4)													
OTHER (NOTE 4)													
TOTAL													

NOTES:
1. DO NOT INCLUDE TRAFFIC THAT TERMINATES ON LC361 LOOP SIGNALING INTERFACE TRUNK GROUPS. INCLUDE LC361 TRAFFIC TO INDIVIDUAL OPX STATIONS. INCLUDE STATION TO ATTENDANT TRAFFIC. SHOW INTERCOM CCS IN INCOMING CCS COLUMN G FOR NETWORK CALCULATION PURPOSES, AND COMPLETE COLUMNS K AND M IF TRUNK GROUP METHOD IS USED.
2. SHOW TOTAL CARRIED CCS IN COLUMN E FOR CALCULATING CCS/TRK. DO NOT INCLUDE IN BOTTOM LINE TOTALS. SHOW TOTAL CARRIED CCS IN OUTGOING CCS COLUMN J AND INCLUDE IN BOTTOM LINE TOTALS.
3. TREAT AS 2-WAY TRUNK GROUP.
4. SHOW AS OUTGOING CCS, COLUMN J, BUT DO NOT APPLY PROBABILITY FACTOR.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 3 - NETWORK MODULE AND LINK SIZING

3.2 NETWORK MODULE AND LINK DETERMINATION

3.2.1 NETWORK MODULE DETERMINATION

CUSTOMER _____

DATE _____

	FROM WORKSHEET	INCOMING CCS (NOTE 1)	TANDEM CCS (COL H)	OUTGOING CCS (NOTE 2)	LINK CCS (NOTE 3)
1. INCOMING FROM COs	3.1.1	☐	☐		☐
2. OUTGOING TO COs	3.1.2			☐	☐
3. TWO-WAY CO - INC.	3.1.3	☐	☐		☐
4. TWO-WAY CO - OUT.	3.1.3			☐	☐
5. INCOMING FROM PBXs . . .	3.1.4	☐	☐		☐
6. OUTGOING TO PBXs	3.1.5			☐	☐
7. TWO-WAY PBXs - INC . . .	3.1.6	☐	☐		☐
8. TWO-WAY PBXs - OUT. . . .	3.1.6			☐	☐
9. INTERCOM AND MISC - INC .	3.1.7	☐			
10. INTERCOM AND MISC - OUT .	3.1.7			☐	☐
11. TOTAL		(a) ☐	(b) ☐	(c) ☐	(d) ☐

12. ADJUSTED INC TRAFFIC = (a) ☐   MINUS (b) ☐   = (e) ☐

13. TOTAL NETWORK CCS = (c) ☐   PLUS (e) ☐   = (f) ☐

14. PROPORTION OF OUTGOING
         TRAFFIC = (c) ☐ DIVIDED BY (f) ☐   = (g) ☐

15. PRELIMINARY NUMBER OF MODULES USING (f) AND (g) INTO TABLE B = (h) ☐

16. ACTUAL NO.
    OF MODULES = (d) ☐ PLUS (f) ☐ DIVIDED BY (j) ☐ 3564 ☐ = (k) ☐
                                                    (NOTE 4)   (NOTE 5)

NOTES:
1. USE COL E FOR WORKSHEETS 3.1.1 AND 3.1.4; USE COL G FOR WORKSHEETS 3.1.3, 3.1.6, AND 3.1.7.
2. USE COL E FOR WORKSHEETS 3.1.2 AND 3.1.5; USE COL J FOR WORKSHEETS 3.1.3, 3.1.6, AND 3.1.7.
3. FOR LINK CCS, SEE STEP 5 OR 6 OF PARAGRAPH 3.04.
4. IF ENERGY COMMUNICATIONS SERVICE (ECS) IS PROVIDED, USE 3492 IN (j) INSTEAD OF 3564.
5. ROUND TO NEXT HIGHER INTEGER. IF (k) IS NOT EQUAL TO (h), SEE STEP 5 OR 6, OF PARAGRAPH 3.04

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 3 - NETWORK MODULE AND LINK SIZING

3.2 NETWORK MODULE AND LINK DETERMINATION

3.2.2 LINK CCS DETERMINATION - TRUNK AVERAGING METHOD

CUSTOMER _____ NO. OF MODULES _____ DATE _____

LINK CCS - INC

1. LINK FACTOR = NUMBER OF MOD. (h) [_____] -1 DIVIDED BY (h) [_____] = (1) [_____]
   (NOTE 1)

2. LINK CCS = LINK FACTOR (1) [_____] X ADJD INC CCS (e) [_____] = (m) [_____]
   (NOTE 1)

LINK CCS - OUT	FROM WORKSHEET	TOTAL CARRIED CCS (NOTE 2)	TOTAL TRUNKS (NOTE 3)	TOTAL TRUNK GROUPS (NOTE 4)
3. OUTGOING TO COs	3.1.2	[____]	[____]	[____]
4. TOTAL 2-WAY CCS TO COs (NOTE 5) . .	3.1.3	[____]	[____]	[____]
5. OUTGOING TO PBXs	3.1.5	[____]	[____]	[____]
6. TOTAL 2-WAY CCS TO PBXs (NOTE 5). .	3.1.6	[____]	[____]	[____]
7. "TOUCH-TONE" REGISTERS	3.1.7	[____]	[____]	[____]
8. "TOUCH-TONE" SENDERS	3.1.7	[____]	[____]	[____]
9. LC361	3.1.7	[____]	[____]	[____]

10.   TOTAL   (n) [_____]   (o) [_____]   (p) [_____]

11. AVERAGE TRUNKS/GROUP = (o) [_____] DIVIDED BY (p) [_____] = (q) [_____]
    (NOTE 6)

12. AVERAGE CARRIED CCS/TRUNK = (n) [_____] DIVIDED BY (o) [_____] = (r) [_____]
    (NOTE 6)

13. LINK FACTOR: USING NO. OF MODULES (h), AVG. TRKs/GRP. (q) AND
    AVG. CCS/TRK (r), READ LINK FACTOR FROM TABLE C = (s) [_____]

14. OUTGOING LINK CCS = OUT CCS (c) [_____] X LINK FACTOR (s) [_____] = (t) [_____]
    (NOTE 1)

15. TOTAL LINK CCS = LINK CCS INC (m) [_____] + LINK CCS OUT (t) [_____] = (v) [_____]
    ENTER VALUE IN BLOCK (v) ON WORKSHEET 3.2.1, LINE 11, BLOCK (d),
    AND COMPLETE WORKSHEET 3.2.1, LINE 16

NOTES:
1. OBTAIN FROM WORKSHEET 3.2.1.
2. USE COL E TOTAL FOR APPROPRIATE WORKSHEET EXCEPT FOR WORKSHEET 3.1.7.
3. USE COL D TOTAL FOR APPROPRIATE WORKSHEET.
4. USE COL B TOTAL FOR APPROPRIATE WORKSHEET.
5. THIS VALUE IS THE TOTAL TRAFFIC ON THE 2-WAY TRUNK GROUPS AND INCLUDES INCOMING TRAFFIC.
6. ROUND TO NEAREST INTEGER.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 3 - NETWORK MODULE AND LINK SIZING

3.2 NETWORK MODULE AND LINK DETERMINATION

3.2.3 LINK PATHS DETERMINATION

CUSTOMER NAME _____   DATE _____

NO. OF MODULES _____

1. LINK GROUPS = NUMBER OF MODULES (k) [_____] X ((k) [_____] -1) ÷ 2 = (w) [_____]
   (NOTE 1)

2. CCS PER LINK GROUP = LINK CCS (d) [_____] ÷ LINK GROUPS (w) [_____] = (x) [_____]
   (NOTE 2)

3. LINK PATHS PER GROUP: USE CCS/GRP (x) AND READ QUANTITY OF LINKS

   PER GROUP FROM TABLE D (y) [_____]
   (NOTE 3)

4. TOTAL LINK PATHS = LINK GROUPS (w) [_____] X LINK PATHS/GRP (y) [_____] = (z) [_____]
   (NOTE 3)

NOTES:
1. OBTAIN FROM WORKSHEET 3.2.1, BLOCK (k).
2. OBTAIN FROM WORKSHEET 3.2.1, BLOCK (d).
3. CHECK VALUES OF BLOCK (y) AND (z) AGAINST SOFTWARE LIMITS SHOWN IN TABLE E.
   (STEP 7 OF PARAGRAPH 3.04 CONTAINS TABLE E DISCUSSION).

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 4 - SMDR ENGINEERING

4.1 SMDR RECORDS AND SMDR AAR/ARS QUEUING RECORDS

1. TOTAL BUSY-HOUR OFFERED CCS ON SMDR
   TRUNK GROUPS FROM WORKSHEET 1.   = (A) _____

2. TOTAL BUSY-HOUR CALLS ON SMDR
   TRUNK GROUPS FROM WORKSHEET 1.   = (B) _____

3. ENGINEERED PROBABILITY OF SMDR
   RECORD BLOCKING (RECOMMEND P_M = 0.001)   = (P_M) _____

4. REQUIRED NUMBER OF SMDR RECORDS
   BASED ON (P_M) AND (A) FROM RETRIAL
   CAPACITY TABLES. (SEE NOTE.)   = (M) _____

5. SMDR AAR/ARS QUEUING RECORDS:

   PROVIDE SMDR AAR/ARS QUEUING RECORDS
   EQUAL TO THE TOTAL OTQ RECORDS FOR THOSE
   TRUNK GROUPS ENABLED FOR SMDR WITH ACCOUNT
   CODE DIALING AND/OR AAR/ARS. SEE TEXT.
   (SEE NOTE.)   = (Q) _____

NOTE: SMDR RECORDS AND SMDR AAR/ARS QUEUING RECORDS ARE
       FEATURE PACKAGE- AND MEMORY-SIZE DEPENDANT.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 4 - SMDR ENGINEERING

4.2 HARDWARE BUFFER SIZE

1. TOTAL BUSY-HOUR CALLS AFTER P_M
   BLOCKING = $(1-P_M)$ (B).   = (C) _____

2. AVERAGE CALLING RATE IN CALLS
   PER SECOND: X = C ÷ 3600.
   IF VALUE OF X CALCULATED ABOVE IS
   > 5.33, USE X = 5.33 FOR FP7.
   FOR FP8, FP11, AND FP12, USE
   CALCULATED VALUE OF X.   = (X) _____

3. IF A DIRECT OUTPUT DEVICE IS BEING
   PROVIDED, SELECT THE REQUIRED BAUD
   RATE AND ITS ASSOCIATED SERVICE
   RATE (CALLS PER SECOND) USING BUSY-
   HOUR CALLS (C) AND THE TABLE BELOW.
   FOR 9-TRACK MAGNETIC TAPE DEVICES,
   USE Y = 124 CALLS PER SECOND AND
   DISREGARD THE TABLE BELOW.

	DIRECT OUTPUT	MAGNETIC TAPE
= (Y)		124

BUSY-HOUR CALLS	BAUD-RATE SETTING	AVERAGE SERVICE RATE (CALLS PER SECOND)
1425	300	0.468
2700	600	0.937
5700	1200	1.87
11,500	2400	3.75
23,500*	4800	7.50

*LIMITED TO 19,200 CALLS/HOUR FOR FP7

4. CALCULATE P = X ÷ Y.

	DIRECT OUTPUT	MAGNETIC TAPE
= (P)		

5. PROBABILITY OF BLOCKING WHEN H,
   HARDWARE BUFFER QUEUES ARE USED.
   H = 16 (DIRECT OUTPUT) OR 62
   (MAGNETIC TAPE). (RECOMMEND $P_H \leq$
   0.001 FOR SELECTED SYSTEM):

$$P_H = \left(\frac{1 - P}{1 - P^{H+1}}\right)\left(P^H\right)$$

	DIRECT OUTPUT	MAGNETIC TAPE
= (P_H)		

6. HARDWARE BUFFER SIZE SELECTED
   (16 FOR DIRECT OUTPUT OR 62
   FOR MAGNETIC TAPE).   = (H) _____

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 4 - SMDR ENGINEERING

4.3 OUTPUT DEVICE

1. TOTAL BUSY-HOUR CALLS (C) FROM
   WORKSHEET 4.2, LINE 1.   = (C) _____

2. PAPER PRINTER
   INCHES PER HOUR = C ÷ 6   = _____

3. PUNCHED PAPER
   INCHES PER HOUR = C X 1.33   = _____

4. MAGNETIC TAPE
   FEET PER HOUR = $\dfrac{C \times 3}{12 \times 310}$ = _____

5. BAUD-RATE SETTING FOR
   OUTPUT DEVICE (DIRECT
   OUTPUT VERSION ONLY).
   USE BAUD RATE SELECTED
   IN WORKSHEET 4.2, LINE 3
   WHICH YIELDED A $P_H \leq 0.001$
   (WORKSHEET 4.2, LINE 5).   = _____

6. OUTPUT DEVICE SELECTED.   = _____

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 5 — ECTS ENGINEERING

5.2 ECTS ETC, STEERING CIRCUITS, AND CARRIER DETERMINATION

1. SUBTRACT BOX (R) FROM BOX (Z), ENTER RESULT IN BOX (J):
    (OBTAIN VALUE OF (R) AND (Z) FROM WORKSHEET 5.1)

    $(Z)-(R) =$ [(J)] TOTAL ECTS SETS REQUIRING STEERING CIRCUITS ON LC55 PACKS

2. DIVIDE BOX (J) BY 126, ROUND UP TO NEXT WHOLE NUMBER, ENTER RESULT IN BOX (K):

    $\frac{(J)}{126} =$ [(K)] ETCs REQUIRED TO ACCOMMODATE STEERING CIRCUIT PACKS

3. DIVIDE BOX (X) BY 4021, ROUND UP TO NEXT WHOLE NUMBER, ENTER RESULT IN BOX (L):
    (OBTAIN VALUE OF (X) FROM WHORKSHEET 5.1)

    $\frac{(X)}{4021} =$ [(L)] ETCs REQUIRED TO ACCOMMODATE MET SET MEMORY

4. a) ENTER (K) OR (L), WHICHEVER IS LARGER:

    [(M)] MINIMUM ETC BASIC CARRIERS

    b) DIVIDE BOX (Z) BY 126, ROUND UP TO NEXT WHOLE NUMBER, ENTER RESULT IN BOX (N):

    $\frac{(Z)}{126} =$ [(N)]

    c) ENTER (M) OR (N), WHICHEVER IS LARGER:

    NUMBER OF ETCs NEEDED TO BE SUPPORTED BY "DIMENSION" PBX MEMORY

    [(O)]

5. a) DIVIDE BOX (J) BY 63, ROUND UP TO NEXT WHOLE NUMBER, ENTER RESULT IN BOX (P):

    $\frac{(J)}{63} =$ [(P)] MINIMUM ETC BASIC AND SUPPLEMENTAL CARRIERS

    b) SUBTRACT (M) FROM (P) AND ENTER RESULT IN BOX (Q):

    $(P)-(M) =$ [(Q)] MINIMUM ETC SUPPLEMENTAL CARRIERS

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 5 — ECTS ENGINEERING

5.3 ECTS "DIMENSION" PBX MEMORY DETERMINATION

LINE	ITEM	SOURCE (NOTE 1)	QTY REQD	MEMORY SIZE (NOTE 2)				
				B	C	D	E	F
1	CONTROLLERS	WORKSHEET 5.2 BOX (O)		0-5	6-8	9-13 (8)	14-32	33-64 (40)
2	STATIONS LINES (MAIN STATIONS) TERMINATING IN ECTS	MKTG		╳	╳	╳	╳	╳
3	TOTAL NUMBER OF DIFFERENT PERSONAL CO LINES	MKTG		╳	╳	╳	╳	╳
4	LINES 2 + 3	╳		0-325	326-500	501-1000 (800)	1001-1600	1601-3200 (2800)
5	TOTAL ECTS SETS	WORKSHEET 5.1 BOX (Z)		0-325	326-500	501-1000 (800)	1001-1600	1601-3200 (2800)
6	TOTAL NUMBER OF DIFFERENT DSS NUMBERS	MKTG (NOTE 3)		0-325	326-500	501-1000	1001-1600	1601-3200 (2800)
7	TOTAL NUMBER OF DIFFERENT PERSONAL CO LINES	SAME AS LINE 3 ABOVE		0-16	17-25	26-50	51-80	81-160 (150)

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 5 — ECTS ENGINEERING

5.3 ECTS "DIMENSION" PBX MEMORY DETERMINATION

LINE	ITEM	SOURCE (NOTE 1)	QTY REQD	MEMORY SIZE (NOTE 2)				
				B	C	D	E	F
8	TOTAL NUMBER OF MANUAL INTERCOM GROUPS	MKTG						
9	TOTAL NUMBER OF AUTOMATIC INTERCOM GROUPS	MKTG						
10	TOTAL MANUAL AND AUTOMATIC INTERCOM GROUPS LINES 8 + 9			0-32	33-50	51-100	101-160	161-320 (300)
11	TOTAL NUMBER OF SINGLE-LINE PLUS STRAIGHT-LINE SETS	WORKSHEET 5.1 BOX (R)+ (S)+(T)+(U)+ (V)+(W)						
12	TOTAL LINE APPEARANCES ON MULTILINE SETS (ALL LINE + PERSONAL CO LINE BUTTONS)	MKTG						
13	TOTAL NUMBER OF MANUAL PLUS AUTOMATIC INTERCOM BUTTONS	MKTG						
14	TOTAL NUMBER OF RINGER TRANSFER BUTTONS	MKTG						
15	TOTAL NUMBER OF DIAL INTERCOM DIRECTORY BLOCKS MULTIPLIED TIMES 10	MKTG (NOTE 4)						
16	TOTAL LINES 11 THROUGH 15			0-1426	1427-2198	2199-4398	4399-7038	7039-14,078 (13,198)

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 5 — ECTS ENGINEERING

5.3 ECTS "DIMENSION" PBX MEMORY DETERMINATION

LINE	ITEM	SOURCE (NOTE 1)	QTY REQD	MEMORY SIZE (NOTE 2)				
				B	C	D	E	F
17	TOTAL NUMBER OF DIAL INTERCOM GROUPS	MKTG		0-32	33-50	51-100	101-160	161-320 (280)
18	TOTAL NUMBER OF MANUAL SIGNALING BUTTONS	MKTG						
19	TOTAL NUMBER OF STATION MESSAGE WAITING BUTTONS	MKTG						
20	TOTAL NUMBER OF STATION BUSY LAMPS	MKTG						
21	TOTAL PBX MEMORY FOR ECTS SETS	WORKSHEET 5.1 BOX (Y)						
22	TOTAL LINES 18 THROUGH 21			0-4128	4129-6050	6051-11,600	11,601-14,400	14,401-33,920 (26,000)

NOTES:
1. "MKTG" UNDER SOURCE COLUMN REFERS TO DATA PROVIDED BY MARKETING.
2. REFER TO TABLES B AND D OF THIS SECTION FOR FEATURE PACKAGE AND MEMORY SIZE
   AVAILABILITY FOR "DIMENSION" 600/2000/CUSTOM PBX. CIRCLED FIGURES UNDER D
   AND F MEMORY SIZES SHOW FP11, AND FP8 AND FP12 MAXIMUMs RESPECTIVELY.
3. IF SAME LINE APPEARS AS TWO OR MORE DIFFERENT BUTTONS ON MET SETS, COUNT
   THAT LINE AS ONE DIFFERENT DSS NUMBER.
4. EACH DIAL INTERCOM GROUP HAS MINIMUM OF ONE DIRECTORY BLOCK AND MAXIMUM OF THREE.
   IF < 10 STATIONS IN GROUP, USE ONE DIRECTORY BLOCK.
   IF 11-19 STATIONS IN GROUP, USE TWO DIRECTORY BLOCKS.
   IF > 20 STATIONS IN GROUP, USE THREE DIRECTORY BLOCKS.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 6 — PROCESSOR OCCUPANCY EVALUATION

6.1   STATIC OCCUPANCY

6.1.1   SUMMARY

	A	B	C	D
	ITEM	QUANTITY	OCC FACTOR	OCC=BXC
CONFIGURATION COMPONENT		////	////	////
1	BASIC	1	FP7 11.4 FP8 15.2 FP9 14.0 FP11 16.9 FP12 15.2	
2	LINE CARRIERS (NOTE 1)		0.05	
3	TRUNK CARRIERS (NOTE 2)		0.30	
4	ATTENDANT CONSOLES (NOTE 3)		0.34 / 0.61	
5	TRUNK RECORDS (NOTE 4)		0.001	
6	ORIGINATING REGISTERS (NOTE 5)		0.03	
7	MESSAGE REGISTERS (NOTE 6)		0.26	
8	POWER METERS (NOTE 6)		0.11	
FEATURE COMPONENT		////	////	////
9	FEATURE ADDITIONS (FROM WORKSHEET 6.1.2)	////	////	
10	TOTAL STATIC OCCUPANCY (LINES 1+2+3+4+5+6+7+8+9)	////	////	

NOTE 1: LINE CARRIERS + LINE GROUP CONTROL CARRIERS.

NOTE 2: TRUNK CARRIERS + TIE TRUNK CARRIERS + MODULE
CONTROL AND TRUNK PORT CARRIERS.

NOTE 3: ATTENDANT CONSOLES + ATTENDANT CONSOLE/TERMINALS
(DOES NOT INCLUDE STATION CONSOLE/TERMINALS — FP9 AND
FP11). USE 0.61 FACTOR FOR FP11, USE 0.34 FACTOR FOR
ALL OTHER FPs.

NOTE 4: IF EXACT QUANTITY IS UNKNOWN, USE 1000 TRUNK RECORD.

NOTE 5: ENGINEERED QUANTITY OF DIAL PULSE + "TOUCH-TONE" + MAXIMUM
NUMBER OF ATTENDANT ORs IN THE FP/MEMORY CONFIGURATION + MAXIMUM
NUMBER OF ATTENDANT CONFERENCE ORs IN THE FP/MEMORY CONFIGURATION.

NOTE 6: IF PROVIDED.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 6 — PROCESSOR OCCUPANCY EVALUATION

6.1   STATIC OCCUPANCY

6.1.2   FEATURE ADDITIONS

	A	B	C	D
	FEATURE	FEATURE PACKAGE	OCCUPANCY FACTOR (IF FEATURE IS ACTIVE)	OCCUPANCY
1	ECTS	7,8,11,12	(see table below)	
2	CAS FADS	8,11,12	0.82	
3	UCD FADS	8,11,12	2.2 + [0.54 X (NO. OF UCD FADS TERMINALS)]	
4	ENERGY CONTROL	9,11	8.8	
5	PROPERTY MANAGEMENT SYSTEM (CIPMS)	9,11	5.0	
6	LOCAL CALL BILLING	9	1.5	
		11	0.5	
7	LONG DISTANCE BILLING	9,11	1.3	
8	TOTAL STATIC FEATURE ADDITIONS (LINES 1+2+3+4+5+6+7) (TO WORKSHEET 6.1.1, LINE 9)	/////	/////	

Table for line 1 (ECTS):

FEATURE PACKAGE	MEMORY CONFIGURATION				
	B	C	D	E	F
7	0.2	0.3	0.5	1.7	3.7
8/12	–	0.3	0.5	–	2.0
11	–	–	0.9	–	–

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 6 — PROCESSOR OCCUPANCY EVALUATION

6.2   METHOD I -- DYNAMIC OCCUPANCY - SPECIFIC OCCUPANCY FACTOR

	A	B	C	D
	ITEM	CALLS	OCC FACTOR	OCCUPANCY = $\frac{BXC}{1000}$
1	NUMBER OF COMPLETED BUSY HOUR CALLS		FP7 3.3 FP8 3.5 FP9 3.0 FP11 3.5 FP12 3.5	

	ITEM		OCC FACTOR	OCCUPANCY
2	ECTS FACTOR		(NOTE 1)	
3	FP9-FP11 FEATURE ADDITION		(NOTE 2)	
4	TOTAL DYNAMIC OCCUPANCY (LINE 1+2+3)			
5	TOTAL STATIC OCCUPANCY (FROM WORKSHEET 6.1.1)			
6	TOTAL OCCUPANCY (LINES 4+5)			

NOTE 1: ECTS FACTOR

ECTS SETS	MEMORY				
	B	C	D	E	F
1-100	1%	1%	2%	5%	5%
101-300	2%	2%	3%	8%	8%
301-800	3%	3%	5%	10%	10%
801 +	4%	4%	6%	12%	12%

NOTE 2: FOR FP9 ENTER 10% IN COLUMN D.
        FOR FP11 ENTER 15%.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 6 — PROCESSOR OCCUPANCY EVALUATION

6.3   METHOD II — DYNAMIC OCCUPANCY - MODEL MATRIX FACTOR

	A	B	C	D
	ITEM	CALLS	OCCUPANCY FACTOR	OCCUPANCY = $\frac{B \times C}{1000}$
1	NUMBER OF COMPLETED BUSY-HOUR CALLS		(NOTE 1)	
2	NUMBER OF CALLS TERMINATING TO ECT SETS		0.7	

	ITEM		OCCUPANCY FACTOR	OCCUPANCY
3	ECTS FACTOR		(NOTE 2)	
4	FP9-FP11 FEATURE ADDITION		(NOTE 3)	
5	TOTAL DYNAMIC OCCUPANCY (LINE 1+2+3+4)			
6	TOTAL STATIC OCCUPANCY (FROM WORKSHEET 6.1.1)			
7	TOTAL OCCUPANCY (LINES 5+6)			

NOTE 1: SELECT THE OCCUPANCY RATE FROM TABLE C, "FEATURE
        MODEL MATRIX", AND ENTER IN COLUMN C.

NOTE 2: USING THE QUANTITY OF CALLS TERMINATING TO ECTS
        FROM LINE 2, SELECT THE RATE, BASED ON MEMORY
        CONFIGURATION, FROM TABLE D, "ECTS TERMINATING
        FACTORS," AND ENTER IN COLUMN D.

NOTE 3: FOR FP9, ENTER 10% IN COLUMN D. FOR FP11, ENTER 15%.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 6 — PROCESSOR OCCUPANCY EVALUATION

6.4   METHOD III - DYNAMIC OCCUPANCY - SPECIFIC CALL
      TYPE FACTOR

6.4.1   SUMMARY

	A	B
	ITEM	OCCUPANCY
1	DYNAMIC CALL PROCESSING OCCUPANCY (FROM WHORKSHEET 6.4.2, LINE 46)	
2	DYNAMIC-FEATURE ADDITION OCCUPANCY (FROM WORKSHEET 6.4.3, LINE 9)	
3	TOTAL DYNAMIC OCCUPANCY (LINES 1+2)	
4	TOTAL STATIC OCCUPANCY (FROM WORKSHEET 6.1.1)	
5	TOTAL OCCUPANCY (LINES 3+4)	

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 6 - PROCESSOR OCCUPANCY EVALUATION

6.4   METHOD III – DYNAMIC OCCUPANCY – SPECIFIC CALL TYPE FACTOR

6.4.2   CALL PROCESSING COMPONENT

A		B	C	D
ITEM		CALLS	OCC FACTOR	OCC=BXC/1000
INTERCOM				
1	TO NON-ECTS STA		1.83	
2	TO ECTS STA		2.51	
INCOMING				
3	DID TO NON-ECTS STA		1.66	
4	DID TO ECTS STA		2.36	
OUTGOING				
5	DOD		2.94	
6	TRUNK TO TRUNK		3.02	
ATTENDANT RELATED				
7	STA TERMINATES TO ATNDT		1.25	
	STA TO STA VIA ATNDT			
8	TO NON-ECTS STA		1.88	
9	TO ECTS STA		2.58	
	ATNDT TO STA			
10	TO NON-ECTS STA		1.37	
11	TO ECTS STA		2.06	
12	INC CO TERMINATES TO ATNDT		2.00	
	INC CO TO STA VIA ATNDT			
13	TO NON-ECTS STA		3.08	
14	TO ECTS STA		3.70	
15	STA TO CO VIA ATNDT		3.50	

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 6 - PROCESSOR OCCUPANCY EVALUATION

6.4   METHOD III - DYNAMIC OCCUPANCY - SPECIFIC CALL TYPE FACTOR

6.4.2   CALL PROCESSING COMPONENT (CONTD)

A		B	C	D
	ITEM	CALLS	OCC FACTOR	OCC=BXC/1000
MAIN/SAT - AT MAIN		/////	/////	/////
16	DID TO SAT VIA MAIN		4.60	
17	STA (MAIN) TO STA (SAT)		4.00	
/////	STA (SAT) TO STA (MAIN)	/////	/////	/////
18	TO NON-ECTS STA		1.80	
19	TO ECTS STA		2.50	
20	DOD (SAT) VIA MAIN		3.00	
MAIN/SAT - AT SATELLITE		/////	/////	/////
/////	DID TO SAT VIA MAIN	/////	/////	/////
21	TO NON-ECTS STA		1.80	
22	TO ECTS STA		2.50	
23	STA (SAT) TO STA (MAIN)		4.00	
/////	STA (MAIN) TO STA (SAT)	/////	/////	/////
24	TO NON-ECTS STA		1.80	
25	TO ECTS STA		2.50	
26	DOD (SAT) VIA MAIN		3.00	
CAS - AT MAIN - (BR=BRANCH)		/////	/////	/////
27	INC CO (BR) TO STA (BR) VIA CAS ATNDT		3.20	
28	INC CO (BR) TERMINATES TO CAS ATNDT		2.00	
29	STA (BR) TERMINATES TO CAS ATNDT		2.00	
CAS - AT BRANCH (BR=BRANCH)		/////	/////	/////
/////	INC CO (BR) TO STA (BR) VIA CAS ATNDT	/////	/////	/////
30	TO NON-ECTS STA		4.33	
31	TO ECTS STA		5.03	
32	INC CO (BR) TERMINATES TO CAS ATNDT		2.31	
33	STA (BR) TERMINATES TO CAS ATNDT		2.23	

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 6 — PROCESSOR OCCUPANCY EVALUATION

6.4 METHOD III — DYNAMIC OCCUPANCY — SPECIFIC CALL TYPE FACTOR

6.4.2. CALL PROCESSING COMPONENT (CONTD)

	A	B	C	D
	ITEM	CALLS	OCC FACTOR	OCC=BXC/1000
UCD/DDC		//////	//////	//////
//////	INC CO TO UCD/DDC STA	//////	//////	//////
34	TO NON-ECTS STA		2.25	
35	TO ECTS STA		2.95	
//////	STA TO UCD/DDC STA	//////	//////	//////
36	TO NON-ECTS STA		2.21	
37	TO ECTS STA		2.91	
OTHER				
38	DATA ENTRY VIA PMS(NOTE 1)		1.83+0.7 X DIGITS PER CALL	
39				
40				
41				
42	TOTAL COMPLETED CALLS (SUM OF COLUMN B)		//////	//////
43	INTERMODULE FACTOR (NOTE 2)		$\left[\left(\frac{N-1}{N}\right) \times \left(0.15\right)\right]$	
44	FALSE START/PARTIAL DIAL		0.81	
45	BUSY/DON'T ANSWER		1.60	
46	TOTAL DYNAMIC OCCUPANCY CALL PROCESSING COMPONENT (SUM OF LINES 1 TO 45) (TO WORKSHEET 6.4.1, LINE 1)	//////	//////	

NOTE 1: THE ESTIMATED BUSY-HOUR DATA ENTRY CALLS AND THE AVERAGE NUMBER OF ESTIMATED DIALED DIGITS FOR SUCH CALLS ARE REQUIRED TO DETERMINE OCCUPANCY EFFECT OF SUCH CALLS. NUMBER OF CALLS IS ENTERED IN COLUMN B AND ESTIMATED NUMBER OF DIGITS IS MULTIPLIED BY 0.7 IN COLUMN C TO DETERMINE COMBINED OCCUPANCY FACTOR.

NOTE 2: THE CALL QUANTITY FROM LINE 42, COLUMN B IS ENTERED IN COLUMN B OF THIS LINE. IN THE EQUATION, N=THE NUMBER OF MODULES. RESULTS ENTERED IN COLUMN D SHOULD BE IN THE 0.5% TO 2% RANGE.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 6 — PROCESSOR OCCUPANCY EVALUATION

6.4 METHOD III - DYNAMIC OCCUPANCY - SPECIFIC CALL TYPE FACTOR

6.4.3 FEATURE ADDITIONS

	A	B	C	D
	ITEM	CALLS	OCC FACTOR	OCC=BXC/1000
1	SMDR		0.15	
2	ARS		0.50	
3	AAR		0.70	
4	QUEUING - RINGBACK		1.00	
5	QUEUING - OFF-HOOK		0.50	
6	LONG DISTANCE BILLING		11.00	

	ITEM	CCS	OCC FACTOR	OCC=BXC
7	PRINTER - CCS		0.17	

	ITEM	CALLS	OCC FACTOR	OCCUPANCY
8	NUMBER OF CALLS TERMINATING TO ECTS		*	
9	TOTAL DYNAMIC OCCUPANCY FEATURE ADDITIONS (LINES 1+2+3+4+5+6+7+8) (TO WORKSHEET 6.4.1, LINE 2)	/////	/////	

* USING THE QUANTITY OF CALLS TERMINATING TO ECTS ENTERED IN COLUMN B, SELECT THE OCCUPANCY RATE, BASED ON MEMORY CONFIGURATION, FROM TABLE D, "ECTS TERMINATING FACTORS," AND ENTER IN COLUMN D.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 7 – MEMORY REQUIREMENTS

7.1 MEMORY CONFIGURATION

A ITEM	B SOURCE (NOTE 1)	C QUANTITY REQUIRED	D MEMORY CONFIGURATION REQUIRED
1. LINES (LINE RECORDS)	DSR		
2. ATTENDANT CONSOLES/TERMINALS	WS 10		
3. ATTENDANT CONFERENCE	DSR		
4. CUSTOM INTERCOM	DSR		
5. SPEED CALLING NUMBERS	DSR		
6. DIRECTORY BLOCKS	WS 7.2		
7. ECTS (NOTE 2)	WS 5	✕	
8. LC34B/LC366 DATA CHANNELS	WS 8		
9. FLEXIBLE NIGHT TRUNKS	DSR		
10. TRUNK/FEATURE DIAL ACCESS CODES	WS 7.3		
11. CALLING NUMBER DISPLAYS	DSR		
12. REMOTE ACCESS TRUNKS WITH VSG	WS 1		
13. MESSAGE REGISTER TRUNKS	DSR		
14. JOURNAL PRINTERS	DSR		
15. POWER METER INTERFACES	DSR		
16. PERIPHERAL INTERFACE CIRCUITS	DSR		
17. LONG DISTANCE BILLING NUMBERS	DSR		
18. SMDR RECORDS	WS 4		
19. SMDR AAR/ARS QUEUING RECORDS	WS 4		
20. TOTAL LINK PATHS	WS 3		
21. ASSIGNABLE TRUNK RECORDS	WS 1		
22. "TOUCH-TONE" DIALING AND DIAL PULSE REGISTER RECORDS	WS 2		
23. LINE CARRIERS (NOTES 3 AND 5)	WS 13		
24. TRUNK CARRIERS (NOTES 4 AND 5)	WS 13		
25. LINK CARRIERS (NOTE 5)	WS 13		
26. CABINETS (NOTE 5)	WS 13		
27. MODULES	WS 3		
PROVIDE THE LARGEST MEMORY REQUIRED BY ANY ITEM ABOVE. MEMORY CONFIGURATION SELECTED (NOTE 6) ——▶			

NOTES:
1. "DSR" UNDER SOURCE COLUMN REFERS TO DATA OBTAINED FROM "DIMENSION" PBX SERVICE REQUEST FORM. WS __ REFERS TO WORKSHEET IN SECTION 554-111-650.
2. MEMORY CONFIGURATION REQUIRED TO SUPPORT ECTS IS ENGINEERED IN SECTION 554-111-625; THE MEMORY SELECTED FOOM WS 5 IS ENTERED IN COLUMN D.
3. INCLUDES LINE GROUP CONTROL CARRIERS.
4. INCLUDES MODULE CONTROL CARRIERS.
5. ITEMS 23 THROUGH 26 ARE TO BE FILLED IN ONLY AFTER THE FINAL CONFIGURATION IS COMPLETED. THEY ARE PROVIDED ONLY FOR VERIFICATION PURPOSES.
6. FOR FEATURE PACKAGE 11, ONLY MEMORY SIZE D IS AVAILABLE.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 7 — MEMORY REQUIREMENTS

7.2   DIRECTORY BLOCKS

FIRST DIGIT								
1. TABLE	2. ___	3. ___	4. ___	5. ___	6. ___	7. ___	8. ___	9. ___
10. ___	11. ___	12. ___	13. ___	14. ___	15. ___	16. ___	17. ___	18. ___
19. ___	20. ___	21. ___	22. ___	23. ___	24. ___	25. ___	26. ___	27. ___
28. ___	29. ___	30. ___	31. ___	32. ___	33. ___	34. ___	35. ___	36. ___
37. ___	38. ___	39. ___	40. ___	41. ___	42. ___	43. ___	44. ___	45. ___
46. ___	47. ___	48. ___	49. ___	50. ___	51. ___	52. ___	53. ___	54. ___
55. ___	56. ___	57. ___	58. ___	59. ___	60. ___	61. ___	62. ___	63. ___
64. ___	65. ___	66. ___	67. ___	68. ___	69. ___	70. ___	71. ___	72. ___
73. ___	74. ___	75. ___	76. ___	77. ___	78. ___	79. ___	80. ___	81. ___
82. ___	83. ___	84. ___	85. ___	86. ___	87. ___	88. ___	89. ___	90. ___
91. ___	92. ___	93. ___	94. ___	95. ___	96. ___	97. ___	98. ___	99. ___
100. ___								

PROCEDURE:
1. LIST EACH THOUSANDS DIGIT IN THE STATION NUMBER PLAN, IF ANY. EXAMPLE: 1XXX, 2XXX, 7XXX.
2. LIST EACH UNIQUE HUNDREDS GROUP. EXAMPLE: 11XX, 27XX, 74XX, OR 1XX, 4XX, 5XX.
3. LIST EACH UNIQUE TENS GROUP. EXAMPLE: 112X, 273X, 746X; 12X, 46X, 73X; OR 7X, 9X.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 7 – MEMORY REQUIREMENTS

7.3   TRUNK/FEATURE DIAL ACCESS CODE MATCH TABLE

1.	2.	3.	4.	5.	6.	7.	8.	9.
10.	11.	12.	13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.	25.	26.	27.
28.	29.	30.	31.	32.	33.	34.	35.	36.
37.	38.	39.	40.	41.	42.	43.	44.	45.
46.	47.	48.	49.	50.	51.	52.	53.	54.
55.	56.	57.	58.	59.	60.	61.	62.	63.
64.	65.	66.	67.	68.	69.	70.	71.	72.
73.	74.	75.	76.	77.	78.	79.	80.	81.
82.	83.	84.	85.	86.	87.	88.	89.	90.
91.	92.	93.	94.	95.	96.	97.	98.	99.
100.	101.	102.	103.	104.	105.	106.	107.	108.
109.	110.	111.	112.	113.	114.	115.	116.	117.
118.	119.	120.	121.	122.	123.	124.	125.	126.
127.	128.	129.	130.	131.	132.	133.	134.	135.
136.	137.	138.	139.	140.	141.	142.	143.	144.
145.	146.	147.	148.	149.	150.	151.	152.	153.
154.	155.	156.	157.	158.	159.	160.	161.	162.
163.	164.	165.	166.	167.	168.	169.	170.	171.
172.	173.	174.	175.					

NOTE: "DIMENSION" 600 PBX MAXIMUM QUANTITY OF TRUNK/FEATURE DIAL ACCESS CODES IS 150.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 8 — DATA CHANNEL REQUIREMENTS

8.1 COST-REDUCED CONTROL CARRIER

EQUIPMENT SLOT DESIGNATION	EQUIVALENT SOFTWARE DESIGNATION SLOT/CIRCUIT		LC366 USAGE		SPECIAL USAGE	
			A	B	C	D
			USE	CP	USE	CP
30	30	0	MAAP	366	MAAP	172
		1	NOT AVAILABLE		RMATS	
31/35	31	0	SMDR/ANY	366	SMDR	171
		1			RMATS	
	35	0			NOT AVAILABLE	
		1			NOT AVAILABLE	
32/36	32	0		366	TIME OF DAY CLOCK	144
		1			NOT AVAILABLE	
	36	0			NOT AVAILABLE	
		1			NOT AVAILABLE	
33/37	33	0	NCOSS/ANY	366		
		1				
	37	0				
		1				
34/38	34	0		366		
		1				
	38	0				
		1				
20/24	20	0		366		
		1				
	24	0				
		1				
21/25	21	0		366		
		1				
	25	0				
		1				
22/26	22	0		366		
		1				
	26	0				
		1				
23/27	23	0		366		
		1				
	27	0				
		1				

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 8 — DATA CHANNEL REQUIREMENTS

8.2 SUPPLEMENTAL I/O CARRIER

EQUIPMENT SLOT DESIGNATION	EQUIVALENT SOFTWARE DESIGNATION SLOT/CIRCUIT		LC366 USAGE	
			A	B
			USE	CP
20/21	20	0 1		366
	21	0 1		
22/23	22	0 1		366
	23	0 1		
24/25	24	0 1		366
	25	0 1		
26/27	26	0 1		366
	27	0 1		
28/29	28	0 1		366
	29	0 1		
30/31	30	0 1		366
	31	0 1		
32/33	32	0 1		366
	33	0 1		

NOTE:
  FOR USE WHEN LC366 CIRCUIT PACKS ARE REQUIRED IN
  ADDITION TO THOSE PROVIDED IN THE COST—REDUCED
  CONTROL CARRIER.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 8 — DATA CHANNEL REQUIREMENTS

8.3 LC34B DATA CHANNELS

ITEMS REQUIRING LC34B DATA CHANNELS			NO. DATA CHANNELS	LC34B PACKS
TYPE	QUANTITY	DATA CHANNELS PER UNIT ITEM		
A	B	C	D = BXC	E = D÷2
ECTS CONTROLLERS		1		
ATTENDANT CONSOLES/ TERMINALS		1		
CALLING NUMBER DISPLAYS TO STATION		1		
FADS DISPLAY TERMINALS*		1		
PERIPHERAL INTERFACE CIRCUITS†		1		
SMDR‡		§		
TOTAL				

* ONLY ONE FADS DISPLAY TERMINAL IS REQUIRED FOR CAS TRAFFIC STUDIES WHILE A MAXIMUM OF 12 TERMINALS MAY BE PROVIDED FOR UCD GROUP TRAFFIC STUDIES (ONE TERMINAL PER GROUP). EACH FADS DISPLAY TERMINAL REQUIRES ONE DATA CHANNEL INTERFACE.

† THE PERIPHERAL INTERFACE CIRCUIT (PIC) IS A GENERAL PURPOSE PROGRAMMABLE INTERFACE UNIT THAT CAN BE USED IN FP9 AND FP11 HOTEL/MOTEL OR HOSPITAL APPLICATIONS AS THE COMMUNICATIONS INTERFACE FOR PROPERTY MANAGEMENT SYSTEM (CIPMS), AS AN INTERFACE FOR PRINTERS, WITH ENERGY COMMUNICATIONS SERVICE, CRT, AND WITH TSPS DATA SETS.

‡ SMDR REQUIRES ONE LC34B WHEN RMATS IS NOT PROVIDED. IF RMATS IS PROVIDED, AN LC171 IS USED WITH RMATS OCCUPYING ONE HALF OF THE LC171 CIRCUIT PACK AND SMDR IS ASSIGNED TO THE OTHER HALF.

§ WHEN TIME OF DAY CLOCK IS USED, IT DISPLACES TWO DATA CHANNELS (ONE LC34B CIRCUIT PACK).

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 9 — RELEASE LINK TRUNK SIZING

9.1 RLT LOAD CALCULATION WORKSHEET   BRANCH LOCATION_____

CALL TYPE	A BUSY-HOUR CALLS	B RLT AHT (SEE NOTE) (SEC)	C CCS $\left(\dfrac{A \times B}{100}\right)$
RA – INCOMING LDN, 800 SERVICE, OR FX TRUNK TO BE EXTENDED TO A STATION			
RB – OUTGOING (DIAL 0) TRUNK OR STATION TO BE EXTENDED TO A TRUNK			
RC – ATTENDANT RECALL FOR TRANSFER TO ANOTHER STATION			
RD – AUTOMATIC RECALLS: DON'T ANSWER, CALL WAITING, REMOTE HOLD			
TOTAL			

A	SEC	RLT AVERAGE HOLDING TIME (COLUMN C TOTAL X 100 ÷ COLUMN A TOTAL)

B	CCS	TOTAL RLT TRAFFIC LOAD FOR THE BRANCH (COLUMN C TOTAL)

C	SEC	RLT QUEUING DELAY AT BRANCH

D		NUMBER OF RLTS REQUIRED FOR BRANCH (SECTION 788-100-142. ERLANG-C CAPACITY TABLES)

NOTE:
 SUGGESTED AHT FOR CALL TYPE–

 RA – 13 SEC + $\langle T_A \rangle$
 RB –   8 DIGITS DIALED – 17 SEC + $\langle T_A \rangle$
      11 DIGITS DIALED – 20 SEC + $\langle T_A \rangle$
      13 DIGITS DIALED – 22 SEC + $\langle T_A \rangle$
 RC – 13 SEC + $\langle T_A \rangle$
 RD –   6 SEC + $\langle T_A \rangle$

   $\langle T_A \rangle$ MEAN ANSWER DELAY AT MAIN (AT&T RECOMMEND 5 SECONDS)

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 9 — RELEASE LINK TRUNK SIZING

9.2 RLT SUMMARY WORKSHEET - MAIN ONLY

BRANCH LOCATION	A BUSY-HOUR CALLS	B RLT AHT (SEC)	C CCS	D RLTS
TOTAL				

A		RLT AVERAGE HOLDING TIME AT MAIN (COLUMN C TOTAL X 100 ÷ COLUMN A TOTAL)
B		MEAN ANSWER DELAY AT MAIN, $\langle T_A \rangle$
C		ATTENDANT AWT AT MAIN FOR RLT GENERATED TRAFFIC (BOX A - BOX B)

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 10 — ATTENDANT SIZING

CALL TYPE	A	B	C
	BUSY-HOUR CALLS (NOTE 1)	AWT (NOTE 2) (SEC)	CCS $\frac{AXB}{100}$
A - INCOMING LDN, 800 SERVICE, OR FX TRUNK TO BE EXTENDED TO A STATION			
B - OUTGOING (DIAL 0) TRUNK OR STATION TO BE EXTENDED TO A TRUNK (NOTE 3)			
C - ATTENDANT RECALL FOR TRANSFER TO ANOTHER STATION (NOTE 4)			
D - ATTENDANT- ORIGINATED CALLS TO STATIONS			
E - ATTENDANT- ORIGINATED CALLS TO TRUNKS			
F - ATTENDANT FEATURE ACTIVATION, ACA REFERRALS, INFORMATION CALLS, DIAL 0 CALLS NOT COMPLETED TO A TRUNK, ETC			
G - RELEASE LINK TRUNK ORIGINATED TRAFFIC			
TOTAL			

NOTES:

1. BUSY-HOUR CALL VALUES ENTERED IN COLUMN A MUST BE TIME CONSISTENT WITH THE ATTENDANT GROUP BUSY HOUR.

2. SUGGESTED AVERAGE AWT FOR CALL TYPE:
   A - MANUAL DIALING (4D) = 13 SEC
       ATTENDANT DSS   = 10 SEC
   B OR E* - ON-NET DEST. (8 + 7D) = 17 SEC
             OFF-NET DEST. (8 + 10D) = 20 SEC
             DIRECT TRUNK GROUP SELECTION = 10 SEC
   C - MANUAL DIALING = 13 SEC
       ATTENDANT DSS = 10 SEC
   D - MANUAL DIALING = 20 SEC
       ATTENDANT DSS = 17 SEC
   F - 6 SEC
   G - ATTENDANT AWT FROM WORKSHEET 9.2, BOX C

   * FOR CALL TYPE B AND E, THE WORK TIME IS 9 SECONDS PLUS ONE SECOND PER DIALED DIGIT FOR NONDIRECT TRUNK GROUP SELECTION-TYPE CALLS

3. THE USE OF NONAUTOMATIC REMOTE ACCESS OR NONUSE OF ARS AND FACILITY RESTRICTION LEVELS, ETC., MAY INCREASE THIS SIGNIFICANTLY. EXPECTED USAGE SHOULD BE CALCULATED.

4. IF STATION DIAL TRANSFER CAPABILITY IS ENABLED, THIS NUMBER MAY APPROACH 0 CALLS.

A	SEC

AVERAGE WORK TIME (AWT)
(COLUMN C TOTAL X 100 ÷ COLUMN A TOTAL)

B	CCS

TOTAL ATTENDANT TRAFFIC LOAD
(COLUMN C TOTAL)

C	SEC

MEAN ANSWER DELAY

D	

NUMBER OF ATTENDANT POSITIONS REQUIRED
(FROM SECTION 788-100-142, ERLANG-C CAPACITY TABLES)

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 11 — UCD/DDC POSITION AND INCOMING FACILITY SIZING

UCD GROUP NUMBER_____   OR   DDC GROUP NUMBER_____

TRUNK TYPE	A BUSY-HOUR CALLS	B AWT (SEC)	C BUSY-HOUR CCS $\left(\frac{AXB}{100}\right)$	D MEAN ANS. DELAY* (SEC)	E QUEUE CCS $\left(\frac{AXD}{100}\right)$	F TRUNK CCS (C+E)	G NUMBER OF TRUNK(S)
1W IN CO							
2W CO							
1W IN FX							
2W FX							
1W IN TIE							
2W TIE							
800 SERVICE							
APLT							
EPSCS							
INTERCOM							
DID 2-DIGIT							
DID 3-DIGIT							
DID 4-DIGIT							
DID LDN							
TOTAL							

A	SEC	AVERAGE WORK TIME (COLUMN B)

B	CCS	BUSY-HOUR CCS (COLUMN C TOTAL)

C	SEC	ANSWER DELAY (COLUMN D)

D		NUMBER OF POSITIONS TO HANDLE GROUP TRAFFIC USING SECTION 788-100-142

* FOR A GIVEN UCD/DDC GROUP ANSWER DELAY (SPEED OF ANSWER) MUST BE UNIFORM FOR ALL TRUNK GROUPS SERVING THE UCD/DDC GROUP.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 12 – ACD AND ENHANCED UCD ENGINEERING

12.1 AGENT POSITIONS AND TRUNK SIZING FOR ACD SPLIT

SPLIT IDENTITY _____

TRUNK TYPE	A TRK GRP BUSY-HOUR CALLS (NOTE 1)	B TRK GRP BUSY-HOUR TO ACD SPLIT BUSY-HOUR FACTOR	C ACD SPLIT BUSY-HOUR CALLS (AXB)	D AGENT AHT (SEC) (NOTE 2)	E AVG AFTER CALL WORK TIME (SEC)	F ACD SPLIT BUSY-HOUR CCS $\left[\dfrac{CX(D+E)}{100}\right]$	G AVG ANSWER DELAY (SEC) (NOTE 3)	H TRK GRP BUSY-HOUR CCS $\left[\dfrac{AX(D+G)}{100}\right]$	I GRADE OF SERVICE	J NUMBER OF TRUNK(S)
1W IN CO										
2W CO										
1W IN FX										
2W FX										
1W IN TIE										
2W TIE										
800 SERVICE										
APLT										
INTERCOM										
DID 2-DIGIT										
DID 3-DIGIT										
DID 4-DIGIT										
DID LDN										
TOTAL										

| A | SEC | AGENT AVG AWT |

AGENT AVG AWT = $\dfrac{\text{COLUMN F TOTAL X 100}}{\text{COLUMN C TOTAL}}$

| B | CCS | ACD SPLIT BUSY-HOUR CCS (COLMUN F TOTAL) |

| C | SEC | AVG ANSWER DELAY (COLUMN G) |

| D | | NUMBER OF POSITIONS TO HANDLE SPLIT TRAFFIC USING SECTION 788-100-142 |

NOTE: 1. INCLUDES ORIGINATING CALLS ON 2-WAY, APLT, AND INTERCOM TRUNK TYPES.
   2. AGENT AHT = AVERAGE TALK TIME PLUS 2-SECOND CALL SETUP TIME.
   3. FOR A GIVEN ACD SPLIT, AVG ANSWER DELAY (SPEED OF ANSWER) WILL BE UNIFORM FOR ALL TRUNK GROUPS SERVING THE SPLIT.

"DIMENSION" 600/2000/CUSTOM PBX
DESIGN ENGINEERING WORKSHEET
WORKSHEET 12 — ACD AND ENHANCED UCD ENGINEERING

12.2 AUXILIARY TRUNK CIRCUITS (FOR ACD ONLY)

1. NUMER OF UNIQUE QUEUE-OF-ORIGIN
   ANNOUNCEMENTS (NOTE 1)   _____

2. NUMBER OF UNIQUE CITY-OF-ORIGIN
   ANNOUNCEMENTS   _____

3. NUMBER OF UNIQUE FIRST DELAY
   ANNOUNCEMENTS (NOTE 1)   _____

4. SYSTEM COMMON SECOND DELAY
   ANNOUNCEMENT (NOTE 2)   _____

5. MUSIC-ON-HOLD ACCESS (NOTE 3)   _____

6. TOTAL AUXILIARY TRUNK CIRCUITS
   REQUIRED (LINES 1+2+3+4+5)   _____

NOTE 1: NUMBER CANNOT EXCEED THE NUMBER OF
         DEFINED SPLITS

NOTE 2: IF SECOND DELAY ANNOUNCEMENT IS PROVIDED,
         ENTER ONE (1) ON LINE 4.

NOTE 3: IF MUSIC-ON-HOLD ACCESS FEATURE IS PROVIDED,
         ENTER ONE (1) AUXILIARY TRUNK CIRCUIT PER MODULE
         CONTAINING ACD AGENTS, IN THE SYSTEM ON LINE 5.