

001305-TP



ZCRD 19109_3 System Requirements Document

Version 14

Date: October 17, 2000

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Change/Revision Log Sheet

10	19109_3		19109_3 System Requirements developed by RNS IT to review with Consumer Project Manager.	9/29/2000
11	19109_3		System Requirements document content modified in Requirements Review meeting 9/29/2000 by meeting participants. System Requirements document content edited and in some cases reformatted by Shannon Brooks-Hamilton. Changes include new title page and revision log sheet.	10/2/2000
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13	19109_3		Modified for minor changes and added new requirements in New Requirements Section from 10/6/2000 meeting. Jackie Graham	10/10/2000
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15	19109.3		Added value of * to Credit Class Equifax data table. It was discovered by Sang Kim and Deirdre Morgan during testing.		11/1/2000

Team	Representative	Signature/Approval Received Verbally or Via E-mail or CMVC	Date
Presentation			
Process			
Consumer PM			
Consumer PM			
IT PM			
Data Common			
Technical Architect			
Technical Services			
Testing			

I. Overview of the ZCRD Data Structure

A ZCRD data structure is created for processing within RNS. This data structure contains information from several possible sources (IMAT, ZTRK, SOLAR, Bill Name and Address window, Credit Information window, RSAG, Deposit Window). The data structure is similar in format to the ZCRD FID. The ZCRD data structure becomes the ZCRD FID only when it is placed on a service order to be sent to SOCS.

II. A ZCRD data structure is created:

1. When a deposit is required on an N order or C order Responsibility Change. A deposit is required when:
 - a service representative negotiates a deposit in lieu of a final bill payment.
 - credit checks in CBI indicate a deposit is required.
2. When there is an N order or C order Responsibility Change and an unpaid final bill/unpaid written off final bill is located by an IMAT search
3. When there is an N order or a C order Responsibility Change, an IMAT search is performed, a match on the customer's social security number or previous or other service telephone number is found, and "Not the customer's account" is then selected on the Social Security/Account # Check Result window (this results in an IMAT deposit reason code of 12). (In this case, ZCRD is populated with IMAT data.)
4. When there is an Equifax hit on a customer record and a subsequent credit check is performed on a different customer during the same CBI session. (In this case, one ZCRD is populated with the original customer ZTRK data.)
5. When two Equifax credit checks are performed, a hit is returned on the two associated customer records, and the Credit Questionnaire is then presented to the rep during the same CBI session. (In this case, a ZCRD is populated with the customer ZTRK data for each credit check. If a ZCRD is required for the Credit Questionnaire, it will be created based on current adverse action rules. Refer to items II.1 and II.2 above.)
6. When there is an Equifax hit on a customer record and a Credit Questionnaire is presented to the rep during the same CBI session. (In this case, one ZCRD is populated with the customer ZTRK data for the credit check. If a ZCRD is required for the Credit Questionnaire, it will be created based on current adverse action rules. Refer to items II.1 and II.2 above.)
7. When there is an Equifax hit on a customer record and CBI returns the message "Do Not Proceed With Order".
8. Deleted

III. [DGM]ZCRD FID on the Current Order

If a ZCRD data structure has been created, per the section II of this document, a ZCRD FID is put on an N order or C order Responsibility Change when the order is issued or held. A ZCRD FID is placed on the order so that if the order is cancelled within SOCS the ZCRD information is sent to and recorded in the AAND database.

A. A ZCRD Data Structure is sent directly from RNS to the AAND database: (These data structures will not appear on a service order to SOCS)

1. When an N order or C order Responsibility Change is cancelled during an RNS session and a deposit is required (from CBI or IMAT).
2. When an N order or C order Responsibility Change is cancelled during an RNS session and an unpaid final bill/unpaid written off final bill (from IMAT) is located.
3. When a ZCRD FID exists on the order (current or pending) and the billing name on the Bill Name and Address window or the Credit Information window is changed to a different customer. (In this case, ZCRD is sent for the prior customer data each time the name is changed and a credit check or check service is performed.
4. When there is an Equifax hit on a customer record and a subsequent credit check is performed on a different customer during the same CBI session. (In this case, one ZCRD is sent with the prior customer ZTRK data.)
5. When there is an Equifax hit on a customer record, a subsequent credit check on a different customer is performed during the same CBI session, and a Credit Questionnaire is presented to the rep during the same CBI session. (In this case, a ZCRD is sent with the customer ZTRK data for each credit check. If a ZCRD is required for the Credit Questionnaire, it is sent based on current adverse action rules. Refer to items II.1 and II.2 above.)
6. When there is an Equifax hit on a customer record and a Credit Questionnaire is presented to the rep during the same CBI session. (In this case, one ZCRD is sent with the customer ZTRK data.)
7. When there is an Equifax hit on a customer record and CBI returns the message "Do Not Proceed With Order".
8. Deleted
9. When there is an N order or a C order Responsibility Change, an IMAT search is performed, a match on the customer's social security number or previous or other service telephone number is found, and "Not the customer's account" is then selected on the Social Security/Account # Check Result window (this results in an IMAT deposit reason code of 12). (In this case, ZCRD is sent with IMAT data.)
10. When Deposit/Final Bill Override is selected as a security method.

B. ZCRD Creation Hierarchy

1. Basic Contact Flow

Assembly of the ZCRD data structure will begin once the representative selects the 'Check Service' functionality and an adverse action is returned. Modification of the ZCRD may occur if a CBI check is requested or performed by the service representative.

If a CBI check is performed, both Equifax information and the Credit Questionnaire may be accessed. CBI will send either the Equifax information or the Credit Questionnaire information to RNS as ZTRK information.

2. ZCRD Creation and Population Processing Flow

A ZCRD data structure will be created for N order and C order Responsibility Changes whenever a deposit is required or an unpaid final bill/unpaid written off final bill exists (See Figure 1). In these cases the following rules are used to populate the ZCRD data structure:

- a. If both IMAT and ZTRK exist within RNS, both IMAT and ZTRK will be populated in the ZCRD data structure.
- b. If there is IMAT data (when it is the customer's account) based on social security number or previous or other account, indicating a deposit or unpaid final bill/unpaid written off final bill exists and there is no ZTRK data, ZCRD is created using IMAT information and default ZTRK values.
- c. If there is no IMAT data and there is ZTRK data from Equifax indicating a deposit is required, ZCRD is created using Equifax information and default IMAT values.
- d. If there is no IMAT or Equifax data and there is ZTRK data based on the CBI Credit Questionnaire indicating a deposit is required, ZCRD is created using ZTRK information from the CBI Credit Questionnaire and default IMAT values.

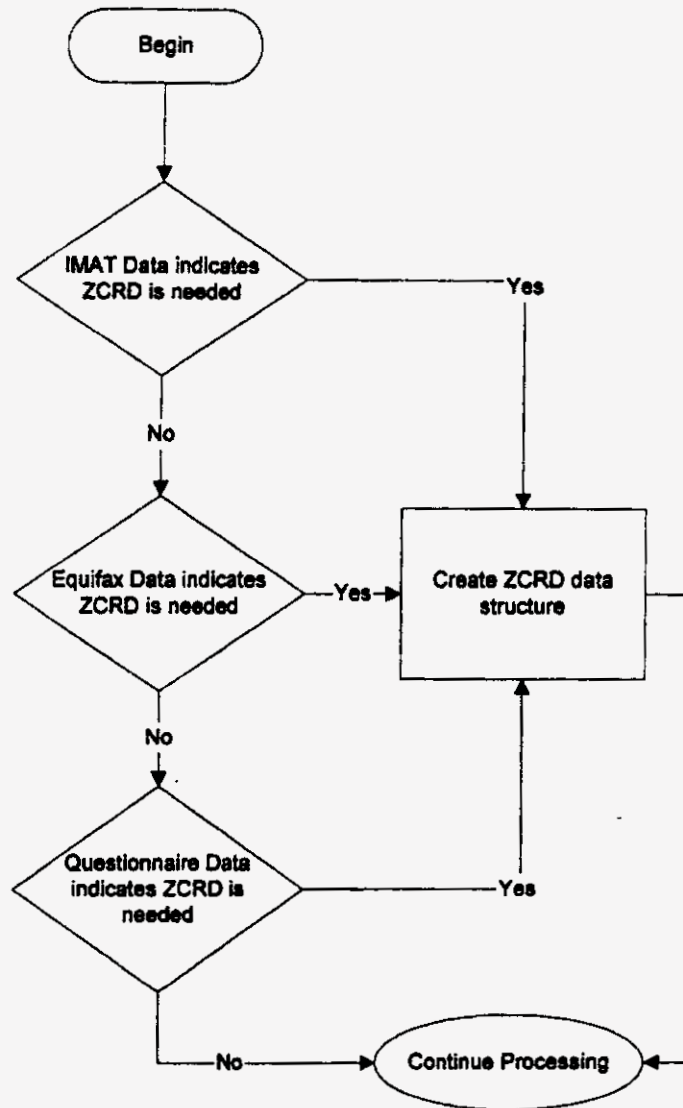


Figure 1. ZCRD Creation and Population Processing

3. ZCRD FID Placed on Service Order

If the ZCRD data structure exists and the order is issued or held, the ZCRD information is placed on the Service Order as the ZCRD FID.

Prior to placing the ZCRD FID on the Service Order, RNS replaces all blanks with plus signs. This allows the FID to pass SOER error handling.

4. ZCRD sent directly to AAND.

In certain instances, the ZCRD data structure is sent directly from RNS to AAND. These are:

- a. If an order contains a ZCRD FID and the Billing Name is changed to a different customer on the Bill Name and Address window or the Credit Information window.

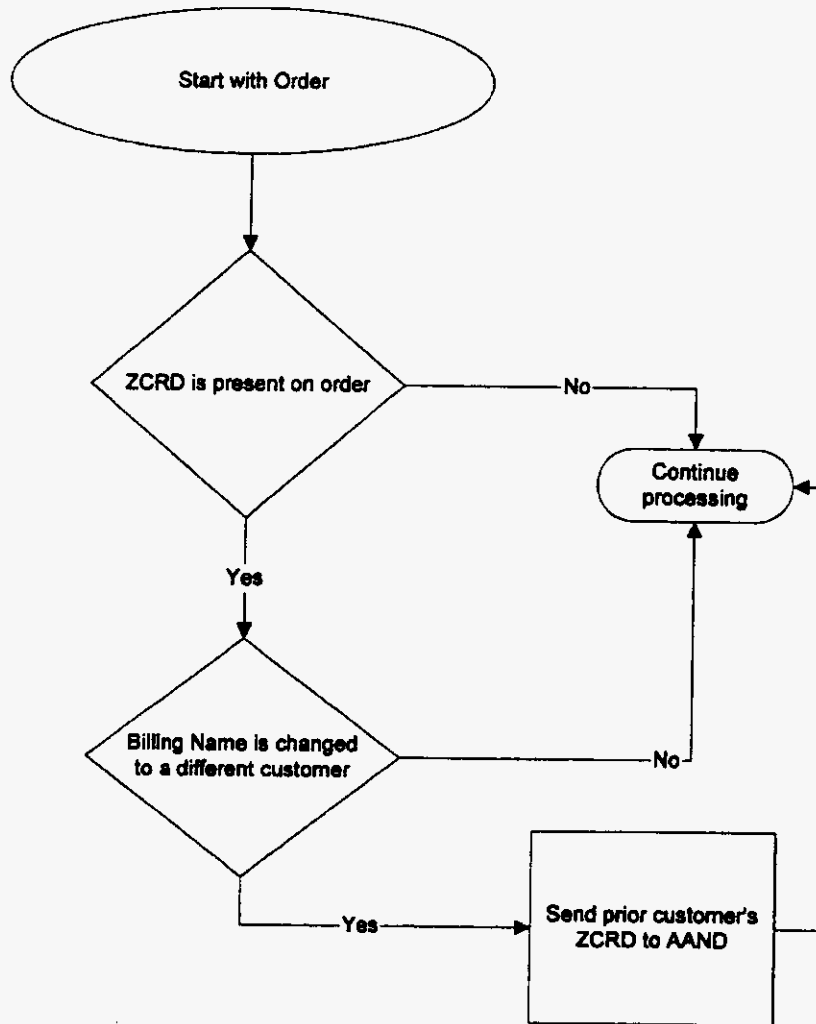


Figure 2. ZCRD Sent to AAND – Bill Name Change

- b. If an IMAT search finds a match on the social security number or previous or other account and “Not the Customer’s Account” is selected.

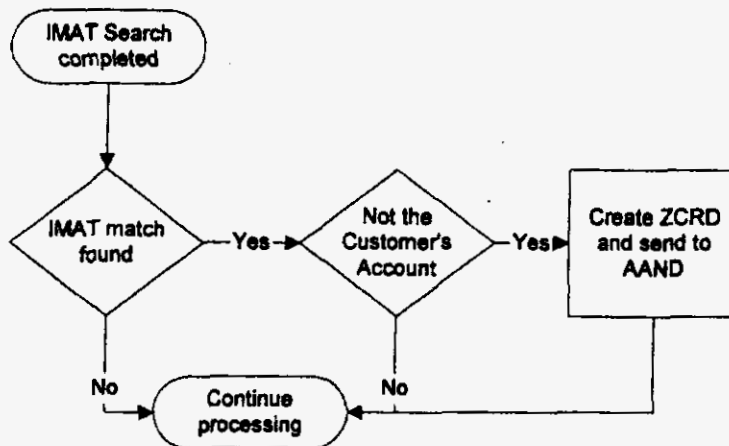


Figure 3. ZCRD Sent to AAND – IMAT Match: Not Customer Account

c. If Deposit/Final Bill Override is selected as a security method.

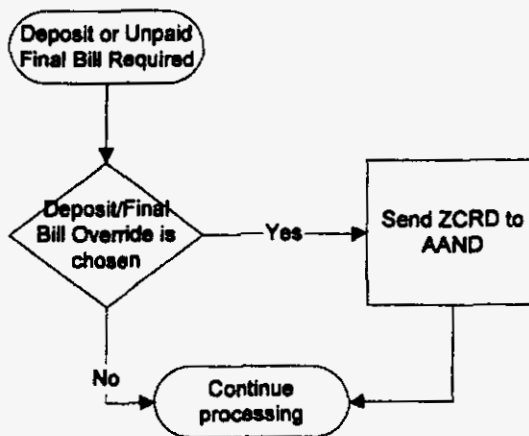


Figure 4. ZCRD Sent to AAND – Deposit/Final Bill Override

- d. Discrepancies, mismatches or errors in customer data may be found through CBI/Equifax that require ZCRD information to be sent directly to AAND. In these instances, CBI indicates to RNS that the ZTRK data passed from CBI should be sent directly to the AAND database and not used in RNS processing. The processing logic in these cases is as follows:
1. Within a CBI session, when an Equifax credit check is performed, if a previous Equifax hit exists on a different customer, the prior customer ZTRK data is sent to AAND in the ZCRD data structure.

2. If a previous Equifax hit exists on a different customer and a CBI Credit Questionnaire is completed, the prior customer ZTRK data is sent to AAND in the ZCRD data structure.

NOTE: CBI allows up to two credit check transactions per CBI session. A CBI session begins when CBI is started from the RNS Credit Information window. It ends when either the Apply button or the Cancel button on the CBI Credit Recommendation window is pressed and CBI displays no error or warning messages. The first credit check is always allowed without any condition. The second credit check is allowed only when CBI determines a "No Recommendation" and the rep selects "yes" to the customer data discrepancy question, from the first credit check. If CBI also determines a "No Recommendation" from the second credit check, then the CBI Credit Questionnaire is presented automatically. At any time during the session, the user has the option to use the CBI Credit Questionnaire after applying the Check Credit Bureau button. CBI does not allow an Equifax credit check when the CBI Credit Questionnaire has been presented.

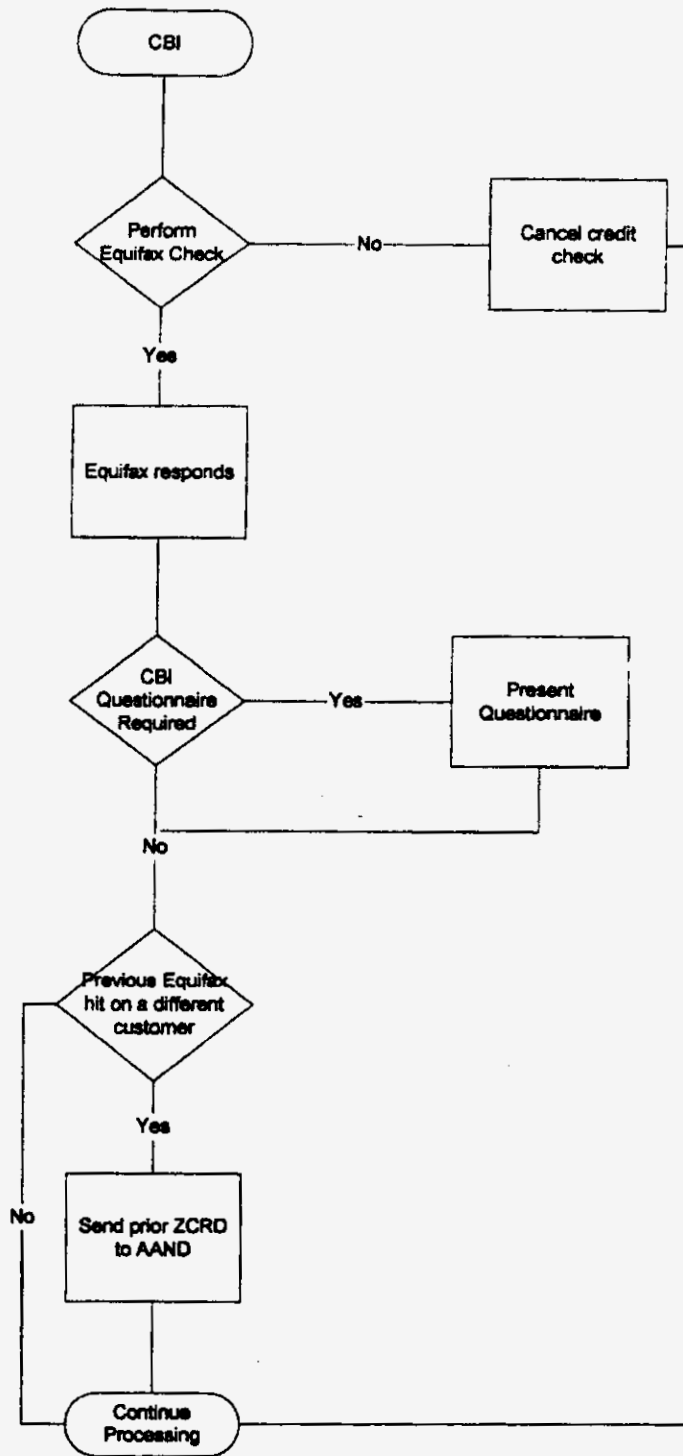


Figure 5. ZCRD Sent to AAND – CBI/Equifax Discrepancies

IV. ZCRD FID Data Structure

A. ZCRD Sections

The ZCRD data structure is composed of five sections in this order:

1. Basic Customer and Order Information fields
2. The IMAT section populated by an IMAT search
3. Future fields (Currently 50 blanks)
4. The ZTRK section populated by an Equifax hit or the Credit Questionnaire
5. The MCC Letter fields section.

B. Basic Customer and Order Information Fields

The following chart displays the name, length, content and source of the ZCRD basic customer and order information fields:

NAME	LENGTH	CONTENT	SOURCE
Date	8	YYYYMMDD(current date)	RNS Process
Time	8	HHMMSSSS(current time)	RNS Process
Origination	1	R, S, or E(refer below for more information)	RNS Process
Origination-Site	1	A, K, L, M, T, O, P, Q, R, Y, W, and X(refer to information below)	RNS Process
Applicant-Last-Name	15	First Fifteen characters of last name	From the Bill Name and Address screen on the order. If not present on the Bill Name and Address screen then use the Credit Information window. If not present on the Bill Name and Address screen or the Credit Information window then the field is blanks.
Applicant-First-Name	25	First Twenty-five characters of first name	Same as Applicant-Last-Name
Applicant-Title	10	Mr., Mrs. Dr., etc.	Same as Applicant-Last-Name
Applicant-Middle-Name	1	Middle Initial	Same as Applicant-Last-Name
Applicant-Lineage	6	Junior, Senior, etc.	Same as Applicant-Last-Name
Service-Address-Street	71	Street address	From the RSAG Contract Output. If no RSAG Contract Output, then the field is blanks.

NAME	LENGTH	CONTENT	SOURCE
Service-Address-City	32	City	Same as Service-Address-Street
Service-Address-State	2	State	Same as Service-Address-Street
Service-Address-Zip	9	ZIP	Same as Service-Address-Street
Applicant-SSN	9	SSN	Credit Information Window
Deposit-Amount	6	Numerics, format 9(6) (refer to information below)	RNS Process
Deposit-Waiver-Indicator	1	Y/N	Deposit Information window
Waiving-CUID	8	Alphanumerics (refer to information below)	RNS Presentation
Originating-CUID	8	CUID of Representative who originated service order	RNS Process

Table 1

(Basic Customer and Order Information Fields)

1. The Origination Field

The Origination field is populated according to the following rules:

- a. If the session is cancelled and the ZCRD data structure is sent directly to AAND from RNS, the Origination field is 'R'.
- b. If the order is held or issued and the ZCRD FID is placed on the order, the Origination field is 'S'.
- c. If a session is cancelled and the originator is e-Store only, the Origination field is 'E'.

2. The Origination-Site Field

The Origination-Site field is populated according to the following rules:

- a. The Site ID from the Service Representative's Profile is translated by RNS to the acceptable AAND codes.
- b. Acceptable codes are:
 - A for Alabama
 - K for Kentucky
 - L for Louisiana
 - M for Mississippi
 - T for Tennessee
 - O for Atlanta and P for out-state Georgia
 - Q for Miami, R for Fort Lauderdale, and Y for Jacksonville Florida
 - W for South Carolina
 - X for North Carolina

3. The Deposit-Amount Field

- a. If the security method Deposit is selected on the Deposit Information window, the Deposit-Amount field is populated by RNS process using the following rules:
 - i. For Alabama, Georgia, Kentucky, Louisiana, Mississippi and Tennessee, the deposit amount prepopulated on the Deposit Information Window is used.
 - ii. For Florida, North Carolina, and South Carolina, the deposit amount manually entered by the Service Representative on the Deposit Information Window is used.
- NOTE: If a partial deposit is chosen on the Deposit Information Window, the full deposit amount from the Deposit Information window is used for the Deposit-Amount field in ZCRD.

- b. For all other security methods, the Deposit Amount field should be blanks. (From version nine of the 19109 requirements document: "Security methods may be satisfied by: Deposit, Partial deposit, Deposit waiver, Deposit/Final bill override, Letter of Guaranty, Bank letter of Credit, Surety Bonds, or Lifeline/linkup.")

4. The Waiving CUID Field

The Waiving CUID field is populated using the following rules:

- a. If Deposit-Waiver-Indicator is Y, the CUID of the Representative who waived the deposit is populated.
- b. If Deposit-Waiver-Indicator is N, the waiving CUID is blanks.

C. Population of IMAT and ZTRK Data

If both IMAT and ZTRK exist within RNS, both IMAT and ZTRK will be populated in the ZCRD data structure. In this case, the IMAT data will be used to populate the MCC letter data in the ZCRD data structure. When only IMAT data is populated in the ZCRD data structure, ZTRK data contains default values. When only ZTRK data (either Equifax or Questionnaire) is populated in the ZCRD data structure, IMAT data contains default values.

D. IMAT Section of ZCRD

The IMAT information is populated from information returned from the IMAT search. All information comes from CRIS with the exception of the Deposit Reason Code.

A maximum of four unpaid final bills/unpaid written off final bills are utilized to populate IMAT.

If there are more than four unpaid final bills/unpaid written off final bills, the four highest unpaid final bills/unpaid written off final bills are used.

If there are less than four unpaid final bills/unpaid written off final bills, the unused IMAT deposit reason(s) is "00", the unused Balance is numeric zeros, and all other unused fields are blank.

The following table shows an example of the name, length, content, and source of the IMAT portion of the ZCRD data structure populated from an IMAT search with four unpaid final bills/unpaid written off final bills:

NAME	LENGTH	CONTENT	SOURCE
Bill-Name (1)	20	Billing Name from CRIS	IMAT search

NAME	LENGTH	CONTENT	SOURCE
Credit-Class (1)	1	A,B,C, or D	IMAT search
Main-TN (1)	13	NPANXXXXXX	IMAT search
Balance (1)	9	Numerics, format 9(7)v99	IMAT search
Installation-Date (1)	8	YYYYMMDD	IMAT search
Disconnect-Date (1)	8	YYYYMMDD	IMAT search
IMAT-Deposit-Reason (1)	2	10, 11, or 12 (refer to information below)	RNS Process based on info from RNS Presentation
Bill-Name (2)	20	Billing Name from CRIS	IMAT search
Credit-Class (2)	1	A,B,C, or D	IMAT search
Main-TN (2)	13	NPANXXXXXX	IMAT search
Balance (2)	9	Numerics, format 9(7)v99	IMAT search
Installation-Date (2)	8	YYYYMMDD	IMAT search
Disconnect-Date (2)	8	YYYYMMDD	IMAT search
IMAT-Deposit-Reason (2)	2	10, 11, or 12. (refer to information below)	RNS Process based on info from RNS Presentation
Bill-Name (3)	20	Billing Name from CRIS	IMAT search
Credit-Class (3)	1	A,B,C, or D	IMAT search
Main-TN (3)	13	NPANXXXXXX	IMAT search
Balance (3)	9	Numerics, format 9(7)v99	IMAT search
Installation-Date (3)	8	YYYYMMDD	IMAT search
Disconnect-Date (3)	8	YYYYMMDD	IMAT search
IMAT-Deposit-Reason (3)	2	10, 11, or 12. (refer to information below)	RNS Process based on info from RNS Presentation
Bill-Name (4)	20	Billing Name from CRIS	IMAT search
Credit-Class (4)	1	A,B,C, or D	IMAT search
Main-TN (4)	13	NPANXXXXXX	IMAT search
Balance (4)	9	Numerics, format 9(7)v99	IMAT search
Installation-Date (4)	8	YYYYMMDD	IMAT search
Disconnect-Date (4)	8	YYYYMMDD	IMAT search
IMAT-Deposit-Reason (4)	2	10, 11, or 12. (refer to information below)	RNS Process based on info from RNS Presentation

Table 2

(IMAT Fields if IMAT is used in the ZCRD data)

NOTE: Credit classes of "W" are changed to "D" prior to going into the ZCRD data structure.

1. The IMAT-Deposit-Reason Field

The IMAT-Deposit-Reason field is populated according to the following rules when unpaid final bills/unpaid written off final bills occur:

- a. If No is chosen on the "Is a deposit required" message and the "Not the Customer's Account" button is NOT chosen, '10' is used in the IMAT-Deposit-Reason field.



- b. If Yes is chosen on the "Is a deposit required" message and the "Not the Customer's Account" button is NOT chosen, '11' is used in the IMAT-Deposit-Reason field.
- c. If the "Not the Customer's Account" button is chosen, '12' is used in the IMAT-Deposit-Reason field.
- d. All IMAT-Deposit-Reason fields that are populated always contain consistent values. (Either a 10, 11 or 12.)

When only IMAT information is present in the ZCRD data structure, the ZTRK information is set to default values as follows:

NAME	LENGTH	CONTENT	SOURCE
Which recommendation	2	**	RNS Process
Equifax Recommendation logic	4	****	RNS Process
Credit Class	1	*	RNS Process
Deposit Required	1	*	RNS Process
Proof of ID Required	1	*	RNS Process
Identification Confirmed	1	*	RNS Process
Telco Score	5	*****	RNS Process
1st adverse action code	5	*****	RNS Process
2nd adverse action code	5	*****	RNS Process
3rd adverse action code	5	*****	RNS Process
4th adverse action code	5	*****	RNS Process
Reject message code	2	**	RNS Process
Safescan Code	1	*	RNS Process
Customer Age	3	***	RNS Process
Application Scoring logic	4	****	RNS Process
Credit Class	1	*	RNS Process
Deposit Required	1	*	RNS Process
Proof of ID Required	1	*	RNS Process
Willing to answer questions	1	*	RNS Process
Self employed question	1	*	RNS Process
Own Home question	1	*	RNS Process
Own Vehicle question	1	*	RNS Process
Checking account question	1	*	RNS Process
Savings Account question	1	*	RNS Process
Major Credit Card question	1	*	RNS Process
Driver's license question	1	*	RNS Process
Time at address	3	***	RNS Process
Transient address	1	*	RNS Process
Exchange Match Indicator	1	*	RNS Process

NAME	LENGTH	CONTENT	SOURCE
Company Name	4	****	RNS Process
Non Pay Amount	7	*****	RNS Process
Connect Date	6	*****	RNS Process
Disconnect Date	6	*****	RNS Process
Application Date	6	*****	RNS Process
Equifax Applicant Social	9	*****	RNS Process
Deposit Reason	2	**	RNS Process

Table 3
(Default ZTRK)

E. ZTRK Portion of ZCRD

ZTRK can be created based on either a hit from Equifax or on the CBI Credit Questionnaire. If only ZTRK is populated on the ZCRD data structure, then IMAT contains default values.

F. Equifax Data

If ZTRK is created from an Equifax hit, the table below shows how ZTRK information is populated. The ZTRK Credit Questionnaire information is set to default values:

NAME	LENGTH	CONTENT	SOURCE
Which recommendation	2	EQ (indicates that the data is from Equifax)	Equifax via CBI
Equifax Recommendation logic	4	01.0, 02.0, etc.	Equifax via CBI
Credit Class	1	B, C, D or *	Equifax via CBI
Deposit Required	1	Y, N	Equifax via CBI
Proof of ID Required	1	Y, N	Equifax via CBI
Identification Confirmed	1	Y, N, * - if Proof Of ID Required is 'N'	Equifax via CBI
Telco Score	5	5 digits, right justified, 0-filled	Equifax via CBI
1st adverse action code	5	Alphanumerics, (refer to information below)	Equifax via CBI
2nd adverse action code	5	Alphanumerics, (refer to information below)	Equifax via CBI
3rd adverse action code	5	Alphanumerics, (refer to information below)	Equifax via CBI
4th adverse action code	5	Alphanumerics, (refer to information below)	Equifax via CBI
Reject message code	2	Alphanumerics, **	Equifax via CBI
Safescan Code	1	Alphanumeric, *	Equifax via CBI

NAME	LENGTH	CONTENT	SOURCE
Customer Age	3	Numerics, (refer to information below)	Equifax via CBI
Application Scoring logic	4	****	CBI
Credit Class	1	*	CBI
Deposit Required	1	*	CBI
Proof of ID Required	1	*	CBI
Willing to answer questions	1	*	CBI
Self employed question	1	*	CBI
Own Home question	1	*	CBI
Own Vehicle question	1	*	CBI
Checking account question	1	*	CBI
Savings Account question	1	*	CBI
Major Credit Card question	1	*	CBI
Driver's license question	1	*	CBI
Time at address	3	***	CBI
Transient address	1	*	CBI
Exchange Match Indicator	1	Y or N	Equifax via CBI
Company Name	4	Alphanumerics, or **** (refer to information below)	Equifax via CBI
Non Pay Amount	7	Numerics, or ***** (refer to information below)	Equifax via CBI
Connect Date	6	yymmdd or ***** (refer to information below)	Equifax via CBI
Disconnect Date	6	yymmdd or ***** (refer to information below)	Equifax via CBI
Application Date	6	mmddyy (refer to information below)	Equifax via CBI
Equifax Applicant Social	9	Numerics or *****	Equifax via CBI
Deposit Reason	2	01, 02, 04, or **	Equifax via CBI

Table 4

(ZTRK Fields from Equifax)

1. 1st Adverse Action Code, 2nd Adverse Action Code, 3rd Adverse Action Code, and 4th Adverse Action Code Fields

The 1st Adverse Action code, 2nd Adverse Action code, 3rd Adverse Action code, and 4th Adverse Action code fields are populated using the following rules:

- a. Adverse Action codes are populated directly from Equifax.
- b. Up to four Adverse Action codes are populated.
- c. If there are no Adverse Action codes or less than four Adverse Action codes, the unused fields are populated with zeros.

2. The Customer Age Field

Customer Age is populated with numerics. If age is not available, '000' is used.

3. The Company Name, Non Pay Amount, Connect Date, and Disconnect Date Fields

The Company Name, Non Pay Amount, Connect Date, and Disconnect Date fields are populated with the following rules:

- a. If the Exchange Match Indicator is Y, then the valid values are used.
- b. If the Exchange Match Indicator is N, then asterisks are used.

4. The Application Date Field

The Application Date will always be populated when there is an Equifax hit.

G. (PGM20)Credit Questionnaire Data

If ZTRK is created from the CBI Credit Questionnaire, the table below shows how ZTRK is populated. The Equifax information is set to default values:

NAME	LENGTH	CONTENT	SOURCE
Which recommendation	2	AS (indicates Application Scoring)	CBI
Equifax Recommendation logic	4	****	CBI
Credit Class	1	*	CBI
Deposit Required	1	*	CBI
Proof of ID Required	1	*	CBI
Identification Confirmed	1	*	CBI
Telco Score	5	*****	CBI
1st adverse action code	5	*****	CBI
2nd adverse action code	5	*****	CBI
3rd adverse action code	5	*****	CBI

NAME	LENGTH	CONTENT	SOURCE
4th adverse action code	5	*****	CBI
Reject message code	2	**	CBI
Safescan Code	1	*	CBI
Customer Age	3	***	CBI
Application Scoring logic	4	01.0, etc.	CBI
Credit Class	1	B, C, D or *	CBI
Deposit Required	1	Y, N or *	CBI
Proof of ID Required	1	Y, N or *	CBI
Willing to answer questions	1	Y, N or *	CBI
Self employed question	1	Y, N or *	CBI
Own Home question	1	Y, N or *	CBI
Own Vehicle question	1	Y, N or *	CBI
Checking account question	1	Y, N or *	CBI
Savings Account question	1	Y, N or *	CBI
Major Credit Card question	1	Y, N or *	CBI
Driver's license question	1	Y, N or *	CBI
Time at address	3	Numerics or ***	CBI
Transient address	1	Y, N or *	CBI
Exchange Match Indicator	1	N	CBI
Company Name	4	****	CBI
Non Pay Amount	7	*****	CBI
Connect Date	6	*****	CBI
Disconnect Date	6	*****	CBI
Application Date	6	mmddyy	CBI
Equifax Applicant Social	9	*****	CBI
Deposit Reason	2	7A, 7B, 7C, 7D, or **	CBI

Table 5
(ZTRK Fields from Credit Questionnaire)

Whenever only ZTRK information (either from Equifax or CBI Credit Questionnaire) is present in the ZCRD data structure, the IMAT information in the ZCRD data structure is set to default values as follows:

NAME	LENGTH	CONTENT	SOURCE
Bill-Name (1)	20	Blanks	RNS Process
Credit-Class (1)	1	Blanks	RNS Process
Main-TN (1)	13	Blanks	RNS Process
Balance (1)	9	Zeros	RNS Process
Installation-Date (1)	8	Blanks	RNS Process
Disconnect-Date (1)	8	Blanks	RNS Process
IMAT-Deposit-Reason (1)	2	00	RNS Process
Bill-Name (2)	20	Blanks	RNS Process
Credit-Class (2)	1	Blanks	RNS Process
Main-TN (2)	13	Blanks	RNS Process
Balance (2)	9	Zeros	RNS Process
Installation-Date (2)	8	Blanks	RNS Process
Disconnect-Date (2)	8	Blanks	RNS Process
IMAT-Deposit-Reason (2)	2	00	RNS Process
Bill-Name (3)	20	Blanks	RNS Process
Credit-Class (3)	1	Blanks	RNS Process
Main-TN (3)	13	Blanks	RNS Process
Balance (3)	9	Zeros	RNS Process
Installation-Date (3)	8	Blanks	RNS Process
Disconnect-Date (3)	8	Blanks	RNS Process
IMAT-Deposit-Reason (3)	2	00	RNS Process
Bill-Name (4)	20	Blanks	RNS Process
Credit-Class (4)	1	Blanks	RNS Process
Main-TN (4)	13	Blanks	RNS Process
Balance (4)	9	Zeros	RNS Process
Installation-Date (4)	8	Blanks	RNS Process
Disconnect-Date (4)	8	Blanks	RNS Process
IMAT-Deposit-Reason (4)	2	00	RNS Process

Table 6
(Default IMAT Fields)

V. Future Fields

Future fields are in the ZCRD data structure and FID. These fields are included to handle future enhancements to the ZCRD data structure and FID. There is a total of 50 blanks.

VI. MCC Letter Fields

A. General Information

1. MCC letter data is populated based upon IMAT data or ZTRK data in the ZCRD data structure. IMAT data is used when the ZCRD data structure contains IMAT data. ZTRK data is used when the ZCRD data structure contains only ZTRK data.
2. An MCC letter is not always created when ZCRD is created. The Generate MCC Indicator specifies if a letter is to be created. The Generate MCC Indicator is populated with a 'Y' according to the following hierarchy (order of precedence) rules:
 - a. The IMAT Deposit Reason Code is populated with a 10 or 11.
 - b. The ZTRK Deposit Reason Codes are populated with a 01, 02, 04, 7A, 7B, 7C, or 7D.
 - c. The Adverse Action codes from Equifax are populated with a 00003, 00005, 00008, 00009, 00024, 00027, 00028, 00041, 00042, 00043, 00061, 00062, 00071, 00072, 00073, 00074, 00075, 00076, or 00077.
3. If the IMAT-Deposit-Reason codes, the ZTRK deposit reason codes, and the Adverse Action codes from Equifax are none of the values mentioned above, then the Generate MCC Indicator is 'N'.
4. The Letter Type is determined by the following rules:
 - a. If the IMAT Deposit Reason Code of 10 or 11 is used to generate the letter, the letter type is a DEP B.
 - b. If the ZTRK deposit reason codes of 02, 7A, 7B, 7C, or 7D are used to generate the letter; the letter type is a DEP B.
 - c. If the ZTRK deposit reason codes of 01 or 04 are used to generate the letter, the letter type is a DEP Q.
 - d. If the Adverse Action codes from Equifax of 00003, 00005, 00008, 00009, 00024, 00027, 00028, 00041, 00042, 00043, 00061, 00062, 00071, 00072, 00073, 00074, 00075, 00076, or 00077 are used to generate the letter, the letter type is a DEP Q.
5. If a Spanish letter is indicated from the Spanish letter message or the Spanish indicator is present on the service order, then:
 - a. DEP B becomes DEP BS.
 - b. DEP Q becomes DEP QS.
6. The following chart displays the name, length, content and source when the Generate MCC Indicator is 'Y' and MCC letter fields are populated using IMAT:

NAME	LENGTH	CONTENT	SOURCE
Generate-MCC-Indicator	1	Y	RNS Process
Letter-Type	8	DEPB or DEPBS.	RNS Process

NAME	LENGTH	CONTENT	SOURCE
Address-Line-1	20	Billing Name	From the Bill Name and Address screen on the order. If not present on the Bill Name and Address screen, then use the Credit Information window. If not present on the Bill Name and Address screen and also not present on the Credit Information window, then the field is blanks.
Address-Line-2	20	Billing Name, City, State, Zip	Address from order in SOLAR. If not available in SOLAR, use the address from RSAG. If not available in SOLAR or RSAG, then the field is blanks.
Address-Line-3	20	Billing Name, City, State, Zip	Same as Address-Line-2
Address-Line-4	20	Billing Name, City, State, Zip	Same as Address-Line-2
Address-Line-5	20	Billing Name, City, State, Zip	Same as Address-Line-2
Adverse-Action-Code-1	5	00010 or 00011 (refer to information below)	IMAT-Deposit-Reason (1) from IMAT data
Adverse-Action-Code-2	5	00010, 00011, or blanks (refer to information below))	IMAT-Deposit-Reason (2) from IMAT data
Adverse-Action-Code-3	5	00010, 00011, or blanks (refer to information below))	IMAT-Deposit-Reason (3) from IMAT data
Adverse-Action-Code-4	5	00010, 00011, or blanks (refer to information below))	IMAT-Deposit-Reason (4) from IMAT data
Utility-Provider	4	Blanks	RNS Process
Utility-Balance	9	Blanks	RNS Process
MCC Deposit-Amount	7	Numerics, format 9(7)	Deposit Amount from Basic Customer and Order Information
IMAT-Account-1	13	Numerics, format 9(13)	Main-TN (1) from IMAT data
IMAT-Balance-1	9	Numerics, format 9(7)v99	Balance (1) from IMAT data

NAME	LENGTH	CONTENT	SOURCE
IMAT-Account-2	13	Numerics, format 9(13)	Main-TN (2) from IMAT data
IMAT-Balance-2	9	Numerics, format 9(7)v99	Balance (2) from IMAT data
IMAT-Account-3	13	Numerics, format 9(13)	Main-TN (3) from IMAT data
IMAT-Balance-3	9	Numerics, format 9(7)v99	Balance (3) from IMAT data
IMAT-Account-4	13	Numerics, format 9(13)	Main-TN (4) from IMAT data
IMAT-Balance-4	9	Numerics, format 9(7)v99	Balance (4) from IMAT data

Table 7

(MCC Letter Fields when IMAT is used in the ZCRD)

B. Adverse Action Code Fields Populated by IMAT

1. The Adverse-Action-Code-1, Adverse-Action-Code-2, Adverse-Action-Code-3, and Adverse-Action-Code-4 fields are populated from IMAT using the following rules:
 - a. Each IMAT Deposit Reason field in the IMAT data populates the corresponding Adverse Action Code field in the MCC letter data.
 - b. If less than four IMAT Deposit Reason fields are available, the unused Adverse Action Code fields in the MCC letter data are populated with blanks.

The following chart displays the name, length, content and source when the Generate MCC Indicator is 'Y' and the MCC letter fields are populated from Equifax:

NAME	LENGTH	CONTENT	SOURCE
Generate-MCC-Indicator	1	Y	RNS Process
Letter-Type	8	DEPB, DEPBS, DEPQ or DEPQS	RNS Process
Address-Line-1	20	Billing Name	From the Bill Name and Address screen on the order. If not present on the Bill Name and Address screen, then use the Credit Information window. If not present on the Bill Name and Address screen and also not present on the Credit Information window, then the field is blanks.

NAME	LENGTH	CONTENT	SOURCE
Address-Line-2	20	Billing Name, City, State, Zip	Address from order in SOLAR. If not available in SOLAR, use the address from RSAG. If not available in SOLAR or RSAG, then the field is blanks.
Address-Line-3	20	Billing Name, City, State, Zip	Same as Address-Line-2
Address-Line-4	20	Billing Name, City, State, Zip	Same as Address-Line-2
Address-Line-5	20	Billing Name, City, State, Zip	Same as Address-Line-2
Adverse-Action-Code-1	5	00001, 00002, 00004, 00003, 00005, 00008, 00009, 00024, 00027, 00028, 00041, 00042, 00043, 00061, 00062, 00071, 00072, 00073, 00074, 00075, 00076, or 00077 (refer to information below)	CBI/Equifax
Adverse-Action-Code-2	5	00003, 00005, 00008, 00009, 00024, 00027, 00028, 00041, 00042, 00043, 00061, 00062, 00071, 00072, 00073, 00074, 00075, 00076, 00077 or blanks (refer to information below)	CBI/Equifax (Or RNS process if blanks)
Adverse-Action-Code-3	5	00003, 00005, 00008, 00009, 00024, 00027, 00028, 00041, 00042, 00043, 00061, 00062, 00071, 00072, 00073, 00074, 00075, 00076, 00077 or blanks (refer to information below)	CBI/Equifax (Or RNS process if blanks)

NAME	LENGTH	CONTENT	SOURCE
Adverse-Action-Code-4	5	00003, 00005, 00008, 00009, 00024, 00027, 00028, 00041, 00042, 00043, 00061, 00062, 00071, 00072, 00073, 00074, 00075, 00076, 00077 or blanks (refer to information below)	CBI/Equifax (Or RNS process if blanks)
Utility-Provider	4	Alphanumerics, Left-justified or blanks	Company Name from ZTRK data
Utility-Balance	9	Numerics, format 9(7)v99	Non Pay Amount from ZTRK data
Deposit-Amount	7	Numerics, format 9(7)	Deposit Amount from Basic Customer and Order Information
IMAT-Account-1	13	Blanks	RNS Process
IMAT-Balance-1	9	Zeroes (0000.00)	RNS Process
IMAT-Account-2	13	Blanks	RNS Process
IMAT-Balance-2	9	Zeroes (0000.00)	RNS Process
IMAT-Account-3	13	Blanks	RNS Process
IMAT-Balance-3	9	Zeroes (0000.00)	RNS Process
IMAT-Account-4	13	Blanks	RNS Process
IMAT-Balance-4	9	Zeroes (0000.00)	RNS Process

Table 8
(MCC Letter Fields when ZTRK from Equifax is used in the ZCRD)

C. Adverse Action Code Fields Populated from Equifax and/or CBI

1. The Adverse-Action-Code-1, Adverse-Action-Code-2, Adverse-Action-Code-3, and Adverse-Action-Code-4 fields are populated from Equifax and/or CBI using the following rules:
 - a. If the ZTRK Deposit Reason field in the ZTRK data is populated with a 01, 02, or 04, then Adverse-Action-Code-1 field is populated with a 00001, 00002, or 00004 and Adverse-Action-Code-2, Adverse-Action-Code-3, and Adverse-Action-Code-4 fields are populated with blanks.
 - b. If the ZTRK Deposit Reason field in the ZTRK data is NOT populated with a 01, 02, or 04 and ZTRK Adverse Action Codes are available, the ZTRK Adverse Action Codes populate Adverse-Action-Code-1, Adverse-Action-Code-2, Adverse-Action-Code-3, and Adverse-Action-Code-4 fields.
 - c. If less than four Adverse Action Code fields are available, then the unused fields are populated with blanks.

The following chart displays the name, length, content and source when the Generate MCC Indicator is 'Y' and the MCC letter fields are populated from the Credit Questionnaire:

NAME	LENGTH	CONTENT	SOURCE
Generate-MCC-Indicator	1	Y	RNS Process
Letter-Type	8	DEPB or DEPBS	RNS Process
Address-Line-1	20	Billing Name	From the Bill Name and Address screen on the order. If not present on the Bill Name and Address screen, then use the Credit Information window. If not present on the Bill Name and Address screen and also not present on the Credit Information window, then the field is blanks.
Address-Line-2	20	Billing Name, City, State, Zip	Address from order in SOLAR. If not available in SOLAR, use the address from RSAG. If not available in SOLAR or RSAG, then the field is blanks.
Address-Line-3	20	Billing Name, City, State, Zip	Same as Address-Line-2
Address-Line-4	20	Billing Name, City, State, Zip	Same as Address-Line-2
Address-Line-5	20	Billing Name, City, State, Zip	Same as Address-Line-2
Adverse-Action-Code-1	5	0007A, 0007B, 0007C, or 0007D	ZTRK-Deposit-Reason from the ZTRK data
Adverse-Action-Code-2	5	blanks	RNS Process
Adverse-Action-Code-3	5	blanks	RNS Process
Adverse-Action-Code-4	5	blanks	RNS Process
Utility-Provider	4	blanks	RNS Process
Utility-Balance	9	blanks	RNS Process

NAME	LENGTH	CONTENT	SOURCE
Deposit-Amount	7	Numerics, format 9(7)	Deposit Amount from the Basic Customer and Order Information data
IMAT-Account-1	13	Blanks	RNS Process
IMAT-Balance-1	9	Zeroes (0000.00)	RNS Process
IMAT-Account-2	13	Blanks	RNS Process
IMAT-Balance-2	9	Zeroes (0000.00)	RNS Process
IMAT-Account-3	13	Blanks	RNS Process
IMAT-Balance-3	9	Zeroes (0000.00)	RNS Process
IMAT-Account-4	13	Blanks	RNS Process
IMAT-Balance-4	9	Zeroes (0000.00)	RNS Process

Table 9
(MCC Letter Field when ZTRK from the Credit Questionnaire is used in the ZCRD)

D. Letters Are Not Generated and the Generate MCC Indicator Field is Set to "N":

1. When there is an Equifax hit on a customer record and a subsequent credit check is performed on a different customer during the same CBI session. The second credit check is allowed only when CBI determines a "No Recommendation" and the rep selects "yes" to the customer data discrepancy question from the first credit check. (In this case, one ZCRD is created with the prior customer ZTRK data.)
2. When there is an Equifax hit on a customer record, a subsequent credit check on a different customer is performed during the same CBI session, and a Credit Questionnaire is presented to the rep during the same CBI session. (In this case, a ZCRD is populated with the customer ZTRK data for each credit check. If a ZCRD is required for the Credit Questionnaire, it will be created based on current adverse action rules. Refer to items II.1 and II.2 of this document.)
3. When there is an Equifax hit on a customer record and a Credit Questionnaire is presented to the rep during the same CBI session. (In this case, one ZCRD is created with the prior customer ZTRK data. If a ZCRD is required for the Credit Questionnaire, it will be created based on current adverse action rules. Refer to items II.1 and II.2 of this document.)
4. Deleted
5. Deleted
6. When Deposit/Final Bill Override is selected
7. When IMAT Deposit Reason is a "12" indicating "Not the Customer's Account".

The following chart displays the name, length, content and source when MCC letter fields are populated but the Generate MCC Indicator is 'N':

NAME	LENGTH	CONTENT	SOURCE
Generate-MCC-Indicator	1	N	RNS Process

Letter-Type	8	Blanks	RNS Process
Address-Line-1	20	Blanks	RNS Process
Address-Line-2	20	Blanks	RNS Process
Address-Line-3	20	Blanks	RNS Process
Address-Line-4	20	Blanks	RNS Process
Address-Line-5	20	Blanks	RNS Process
Adverse-Action-Code-1	5	Blanks	RNS Process
Adverse-Action-Code-2	5	Blanks	RNS Process
Adverse-Action-Code-3	5	Blanks	RNS Process
Adverse-Action-Code-4	5	Blanks	RNS Process
Utility-Provider	4	Blanks	RNS Process
Utility-Balance	9	Blanks	RNS Process
Deposit-Amount	7	Blanks	RNS Process
IMAT-Account-1	13	Blanks	RNS Process
IMAT-Balance-1	9	Zeroes (0000.00)	RNS Process
IMAT-Account-2	13	Blanks	RNS Process
IMAT-Balance-2	9	Zeroes (0000.00)	RNS Process
IMAT-Account-3	13	Blanks	RNS Process
IMAT-Balance-3	9	Zeroes (0000.00)	RNS Process
IMAT-Account-4	13	Blanks	RNS Process
IMAT-Balance-4	9	Zeroes (0000.00)	RNS Process

Table 10
(MCC Letter Field when no letter is generated)

PROGRAMMING SPECIFICATIONS

1.0 **IMPACT AREA: Deposit/Final Bill Override Security Method.**

DESCRIPTION: Handling of the ZCRD data structure when the Deposit/Final Bill Override Security Method is selected.

BUSINESS RULES: Reference Consumer Requirements for Feature #19109.

When the Deposit/Final Bill Override Security Method is selected:

1. RNS shall send the associated ZCRD data structure directly to AAND and the data structure shall not be placed on the order.
2. The Generate MCC Letter indicator of the ZCRD data structure shall be set to "No" and no MCC letter data shall be populated.

RESTRICTIONS: N/A

EDITS REQUIRED: N/A

DATA INPUTS: ZCRD data structure

DATA OUTPUTS: AAND data contract

KNOWN CONTRACT CHANGES: none.

2.0 **IMPACT AREA: IMAT Deposit Reason code 12 (not the customer's account).**

DESCRIPTION: Handling of IMAT Deposit Reason code 12 (not the customer's account).

BUSINESS RULES: Reference Consumer Requirements for Feature #19109.

When Deposit Reason code 12 (not the customer's account) is selected:

1. RNS shall send the associated ZCRD data structure directly to AAND and the data structure shall not be placed on the order.
2. The generate MCC Letter indicator of the ZCRD data structure shall be set to "No" and no MCC letter data shall be populated.

RESTRICTIONS: N/A

EDITS REQUIRED: N/A

DATA INPUTS: ZCRD data structure

DATA OUTPUTS: AAND data contract

KNOWN CONTRACT CHANGES: none.

3.0 **IMPACT AREA: CBI "Do Not Proceed with Order" Message.**

DESCRIPTION: Handling of the CBI "Do Not Proceed with Order" message.

BUSINESS RULES: Reference Consumer Requirements for Feature #19109.

When CBI displays a "Do Not Proceed with Order" message:

1. RNS shall not receive a credit class recommendation from CBI.

2. CBI will not populate the Credit Class field on the Credit Information window.
3. In the case that an IMAT search has been performed, Credit Class shall be set to the IMAT recommendation.
4. Deleted

RESTRICTIONS: N/A

EDITS REQUIRED: N/A

DATA INPUTS: N/A

DATA OUTPUTS: N/A

KNOWN CONTRACT CHANGES: none.

- 4.0 IMPACT AREA: CBI Hits in Non Adverse Action situations (not N order or C orders with Responsibility changes).**
DESCRIPTION: Handling of CBI hits in non Adverse Action situations (not N order or C orders with Responsibility changes).
BUSINESS RULES: Reference Consumer Requirements for Feature #19109.

1. When CBI hits are generated in non Adverse Action situations (not N order or C orders with Responsibility changes), RNS shall not send ZCRD data structures to AAND.

RESTRICTIONS: N/A

EDITS REQUIRED: N/A

DATA INPUTS: N/A

DATA OUTPUTS: N/A

KNOWN CONTRACT CHANGES: none.

- 5.0 IMPACT AREA: Population of the Originating CUID in the ZCRD Data Structure.**
DESCRIPTION: Population of the Originating CUID in the ZCRD data structure.
BUSINESS RULES: Reference Consumer Requirements for Feature #19109.

When a ZCRD data structure is created, the originating CUID shall be populated as follows:

1. In the case of a pre-existing ZCRD Fid on a pending or current order, the originating CUID shall be set to the originating CUID of the pre-existing ZCRD Fid.
2. In the case of N orders or C Order Responsibility Changes with no preexisting ZCRD FID on a pending or current order, the originating CUID shall be set to the CUID of the Service Representative originating the order.

RESTRICTIONS: N/A

EDITS REQUIRED: N/A

DATA INPUTS: N/A

DATA OUTPUTS: N/A

KNOWN CONTRACT CHANGES: none.

6.0 IMPACT AREA: Population of the IMAT and ZTRK Data Segments of the ZCRD Data Structure.

DESCRIPTION: Population of the IMAT and ZTRK data segments of the ZCRD data structure when both IMAT and ZTRK data exists.

BUSINESS RULES: Reference Consumer Requirements for Feature #19109.

When IMAT and ZTRK data exists and the IMAT deposit Reason Code indicates that the data is the customer's account (Deposit Reason Codes of 10 or 11):

1. Both the IMAT and ZTRK data segments of the ZCRD data structure shall be populated.
2. The IMAT data shall be used to determine the Credit Class.
3. The IMAT data shall be used to determine whether an MCC letter is to be generated and the MCC letter contents.

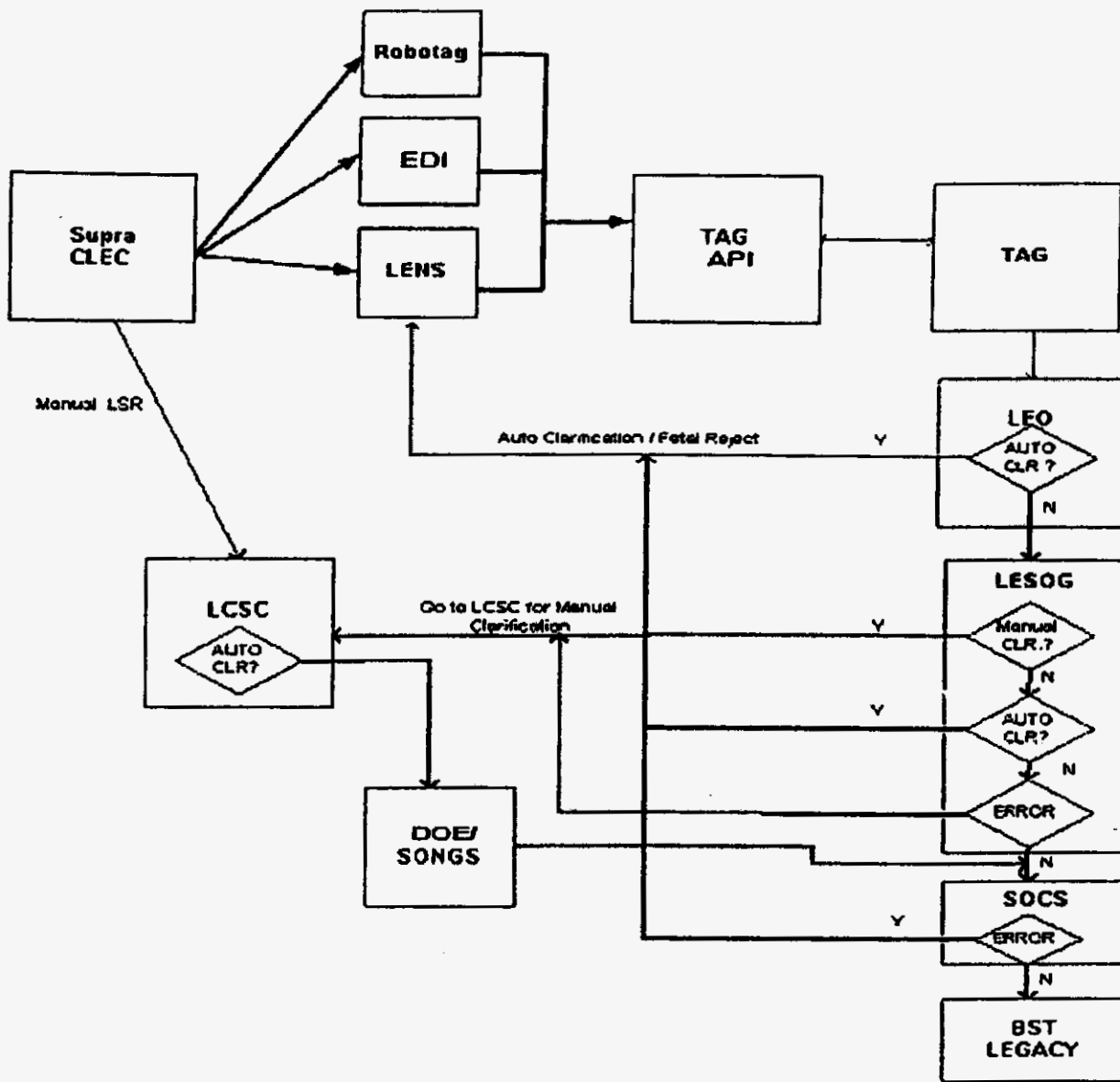
RESTRICTIONS: N/A

EDITS REQUIRED: N/A

DATA INPUTS: N/A

DATA OUTPUTS: N/A

KNOWN CONTRACT CHANGES: none.



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EXHIBIT AZ-2

BellSouth

Telecommunication Access Gateway Training - Release 2.2

EXHIBIT A2-3

BellSouth Telecommunications

***Telecommunications Access Gateway Training
for CLEC Programmers***

September 8, 1999

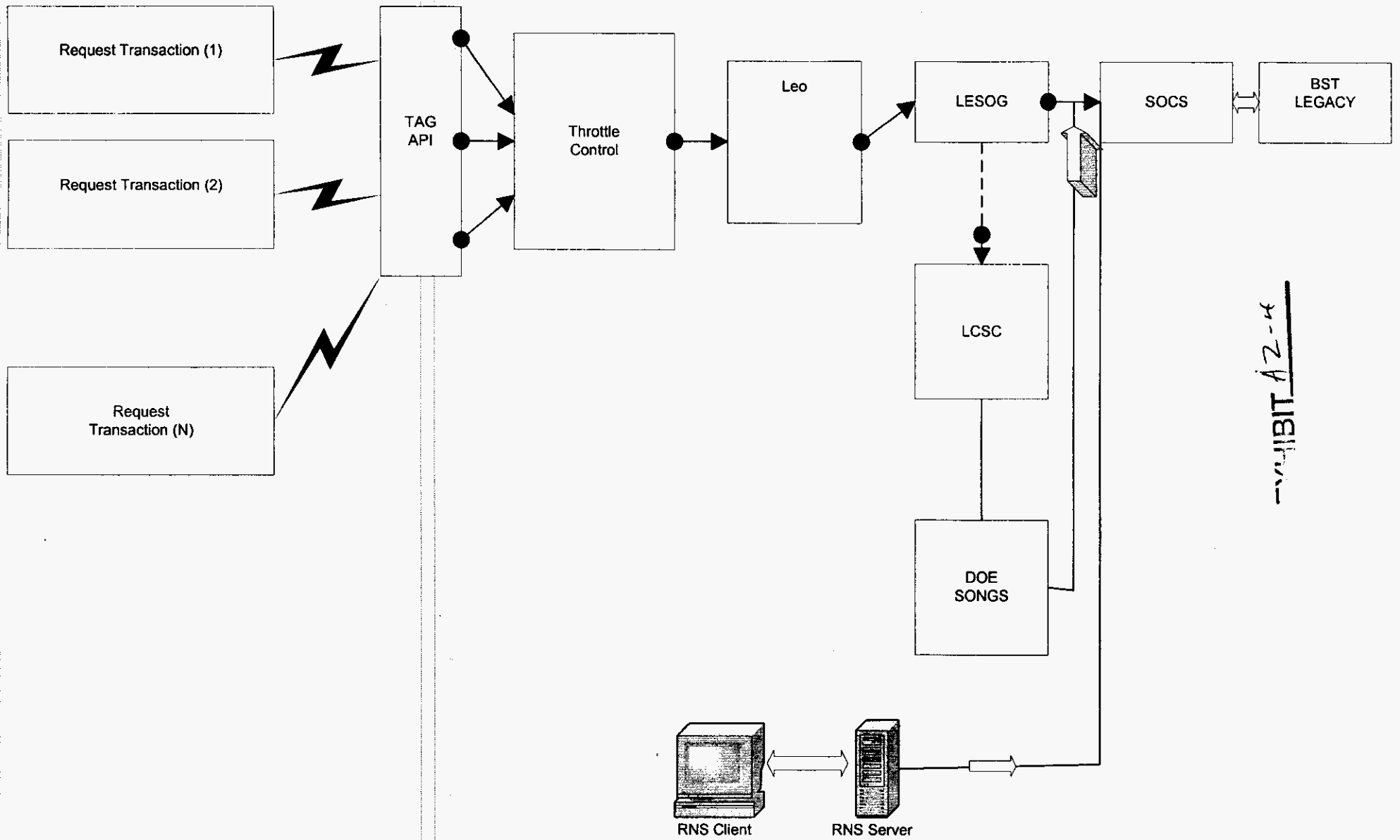
Proprietary: Not for use or disclosure outside BellSouth except under written agreement

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Throttle Control

- **Designed to prevent flooding**
- **Monitors requests rate**
- **CLEC Application Id level**
- **Any current credentials are revoked**
- **Ability to obtain credentials is revoked**
- **BellSouth intervention required**



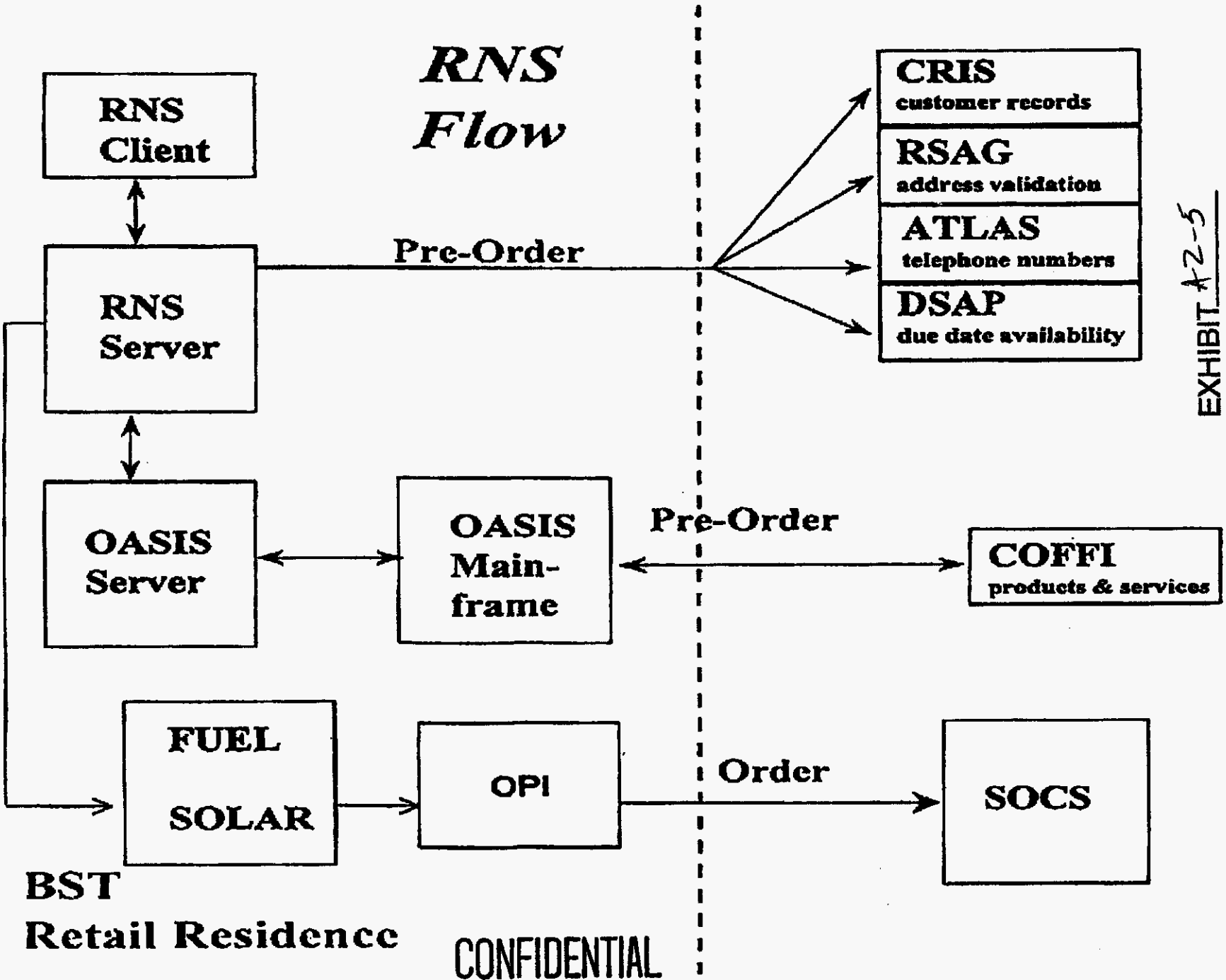


EXHIBIT A2-5

REGIONAL NEGOTIATION SYSTEM

TECHNICAL ARCHITECTURE DOCUMENT

June 22, 2000

Jim Bates – Solutions Designer

BTSI – Engineering and Design

EXHIBIT AZ-6

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Introduction

The Regional Negotiation System (RNS) is a mission critical application for the BellSouth Consumer Services organization in their Sales, Service, and Collections Centers. RNS is a distributed client server application that handles real-time service order generation, handling of customer collections and credits, and accessing and updating customer account information. RNS was designed to interface with several legacy mainframe systems. The environment also includes several dedicated databases allowing the user to view available network features, and an associated application to allow updates to the appropriate mainframe systems at the close of a customer contact session.

RNS was initially developed and field-tested within BellSouth during the 1991 timeframe, as a replacement to several mainframe and midrange applications accessed via IBM-compatible 3270 terminals. After extensive development in the Montgomery (AL) Sales and Service Center, general implementation was rolled out to all locations during 1992 through 1994. The hardware platforms included HP 730/750 Unix servers, HP RX700 x-terminals, and shared media Ethernet LAN hubs (Cabletron MMAC). During the period of 1998 through May, 1999, the Consumer Platform 2000 Project changed the Unix platform of the project from HP servers to Sun E3500 servers, and the LAN infrastructure was upgraded to switched port LAN hubs (Cabletron SmartSwitch).

Business office locations supported by RNS are referred to as Tier 1, Tier 2, or Tier 3, based on size (number of positions). The platform and network design for the largest offices (Tier 1) have higher bandwidth WAN network connections and a multi-hub LAN configuration, built to serve a complex building layout typically with multiple floors and a resource (computer) room. Middle size (Tier 2, around 88 positions) and low size (Tier 3, less than 70 positions) locations have lower bandwidth WAN connections and simpler LAN hub designs. Also, Tier 1 sites are provided database servers (used by the RNS application) within the local office, while Tier 2 and 3 sites are provided the same database in centralized servers within the Data Centers. These designs will be described later in this document. Currently, there are approximately 14 Tier 1 sites within BellSouth, and 48 Tier 2 and 3 sites. Appendix A provides a current list of RNS locations and designations of which design model (Tier 1, 2, 3) is used for each site.

I. Application Architecture

The RNS application is written in several languages, but primarily in ANSI C. The application retrieves any required data from either mainframe systems or the OASIS (Obtain Available Services Information System) database during the initiation of the user contact session. All data communications are via the TCP/IP protocol over the BOSIP network (BellSouth Open Systems Interconnect Platform). The OASIS database provides information about the available features and rates in the customer serving central office switch. Mainframe access is provided by Navigator contracts, primarily to CRIS (Customer Records Information System) for customer account and billing information, and SOCS (Service Order Control System) for service order generation or retrieval of status on pending service orders. OPI (Ordering Process Interface) is an associated application in the RNS environment that issues update Navigator contracts to the appropriate mainframe systems at the close of the user contact. The RNS presentation layer supports a graphical user interface (GUI) using Motif under X11 windows.

The RNS application is maintained and supported by Andersen Consulting, for BellSouth. The application architecture itself is documented in the RNS Application Profile, which is provided by Andersen. This documentation includes Support Responsibilities (Andersen, EDS, BellSouth), as well as technical information on the available software packages available from DDS, application processes, database processes, remote system processes (use of Navigator), daily maintenance, problem resolution, and server fail-over procedures.

The RNS application is normally scheduled to be available Monday through Saturday, 7:00 A.M. – 10:00 P.M. local time.

Service Level Agreements (SLA's) are currently being negotiated, and will be documented in a separate document.

II. Technical Architecture

This documentation of the RNS technical architecture describes the infrastructure provided to support the RNS application in meeting the business needs of Consumer Services. The format will follow the major segments of the technical architecture provided by BTSI Roadmap/Architecture Segment strategies. Each segment should represent a well-defined set of technology components, vendors, standards, and disciplines. Relevant supporting components to the RNS application itself will be mentioned and discussed briefly.

I. Platform

The platform segment defines the platform hardware and operating system software for the RNS Unix servers and the desktop workstations. In addition, printing devices and legacy HP servers for DOE (Direct Order Entry) access are briefly discussed.

I. Sun Servers

Hardware description

The midrange Unix server platform used by RNS is the SUN E3500, running Operating System Solaris 2.6. The E3500 is a midrange Unix server that has modular hardware components and a highly scalable operating environment. The server enclosure is a 5 slot design (1 of which being a required I/O module).

Different server configurations are used for the 3 basic RNS functions: boot/desktop, application, and database. The boot/desktop server provides local xterminal boot services, and provides the standard GUI-based desktop with the appropriate icons and menu choices. The application server is where the RNS application executes. The boot/desktop and application servers are always physically located in the local RNS office, and are interconnected with the LAN infrastructure. The database server contains the OASIS and OPI databases available to the RNS application. The database servers may locally provided for the large (Tier 1) locations, while the smaller (Tier 2, 3) offices would share database servers, centrally located within the Birmingham and Charlotte Regional Data Centers. A local application server within a Tier 2 or 3 location would access their remote databases within the Data Centers via the WAN (BOSIP).

The current server hardware specifications for the 3 functions (boot/desktop, application, and database) are given in Appendix B for Tier 1, and Tier 2,3 locations. These specifications should be considered as a minimum, since local conditions may require even greater capacity in some locations. Also included are environmental factors (height, weight, power, heat).

Each boot/desktop server will have at least 2 disks, where all the required directories and file systems are contained on one spindle, and the entire disk is mirrored onto the second disk device. The application servers will each have at least 3 disks. The same primary disk and mirrored disk scheme is used on the application servers as was described for the boot servers. The third disk is used to store daily log files created from RNS sessions as an historical archive for each service rep. This log file disk is not mirrored. There are five disks on the database servers. The Database servers use a similar mirroring technique for the primary system disk and its mirror. In addition, the Informix databases for OPI and OASIS are spread over two disks, and are mirrored to the remaining disk.

Sizing ratios/pooling / performance

The boot servers are sized to support a sixty-to-one user to server ratio. They can support one hundred and twenty users in a slightly degraded mode, such as might be temporarily required in a fail-over situation to recover from a failing boot server. The application servers are also designed to support a sixty-to-one user to server ratio. There have been tests performed where an application server has supported over seventy users, but the results of such a load are unpredictable, and are not supported. Each database server is configured to handle about twenty-five simultaneous user requests, as that is the number of instances of OPI and OASIS that are defined. However, there can easily be hundreds of user sessions attached to the database server that are seemingly receiving simultaneous service.

Fail-over strategies

A failing boot server can be 'failed over' to a functional boot server in the same site by the EDS Midrange Technical Support group. There is a copy of the file /etc/bootptab on each server containing a list of all of the Xterminals that require boot services from any boot server in that site. In other words, each boot server has a list of Xterminals that that server is supposed to service, and a list of the Xterminals in that site that any other boot server can provide boot services to. By, concatenating the /etc/bootptab file from the failing server to a functional server, the Xterminals that were attached to the failing server can be rebooted. The failure of an application server, or of a database server, is handled automatically by Navigator through its contract routing programs.

Distributed server operating environment

The operating environment for all servers remote from the Data Center should be carefully controlled. The following components of this environment should be provided according to the specifications as a minimum standard:

- 1) Controlled access server/resource room
- 2) Adequate ventilation/heating/cooling
- 3) Adequate electrical sources (required electrical circuits, panel amperage, isolated grounding from building power)

- 4) Uninterruptible Power Source (UPS) – either shared building source or individual battery powered units per server
- 5) Local console terminal and remote console access via Datakit (VCSN Network) – properly secured access for local or remote support personnel
- 6) Proper mounting/racking arrangements
- 7) Proper labeling on all components for trouble reporting and reconfiguration (e.g. IP addresses, hostnames, LAN hub connections, circuit ID's)

II. X-terminals

The primary desktop device used by the RNS service representative is an Xterminal. There are several manufacturers and models currently installed. All Xterminals require an internal or external Ethernet transceiver and associated RJ45 modular jack, for the LAN connection to the associated boot server (X-client). There is no known physical inventory of these types by model, but the following estimate has been provided by the Consumer CIO group:

Manufacturer/Model	Memory	Approximate #	Approximate age
HP RX700	18 MB	3950	7.5 years
HP Envisex	20 MB	3000	6.5 years
HP Entria	20 MB	2000	6 years
NCD/Tektronix	26 MB	100	4 years
NCD/Tektronix	40 MB	200	2 years

The Xterminal environment has recently proven to be a problem due to color constraints, memory limitations (especially for browser-enabled online documentation and training material), and hardware maintenance problems in finding replacement parts. A future strategy for replacement of the Xterminal as the primary RNS desktop device is being developed.

III. PC desktops

Personal computers are used in RNS sites to access the application, primarily by management supervisors or anyone requiring PC/Window application functionality. The PC accesses the RNS boot server for the desktop services by using an x-terminal emulator program. The standard BellSouth PC application for this function is Hummingbird eXceed running over the TCP/IP communications application, to access the network at 10 megabits-per-second. Each PC with the eXceed application is configured to point to the designated RNS boot server's IP address.

There is no uniform hardware configuration for the 'typical' PC in the Consumer RNS sites. All networked PC's require a Network Interface Card with the associated RJ45 modular jack for the LAN connection. Not all PC's in Consumer offices are used to access RNS.

IV. Printers

Printers provided for RNS application printing are primarily HP LaserJet or Lexmark Laser Printers. They are used for RNS application prints (e.g. customer bills and service orders), mainframe system prints (l-terms mapped to printer IP addresses), and screen prints. Unix print spoolers are built on each Sun boot server for spooling prints to the LAN printers across the network. The Laser printers have Ethernet Network interface cards and communicate with the LAN via TCP/IP protocol at 10 megabits-per-second (via RJ45 jack).

V. Legacy HP Servers (DOE access)

The Direct Order Entry (DOE) application is a legacy service order generation application, currently being maintained for its ability to execute complex orders not currently possible in RNS. DOE runs on manufacturer discontinued minicomputers (AT&T 3B2 Model 400) in the Charlotte Regional Data Center. The application is accessed via the Bisynchronous Communications protocol (BSC) through serial interfaces into each DOE processor.

In order to access DOE from the RNS LAN environment, legacy communications gateway servers (HP 750's) are provided on each RNS LAN in the Eastern states (Florida, Georgia, North and South Carolina). These servers allow the LAN-attached users to access the communications services on the gateway servers via a Unix TN3270 client (I/O Concepts) on the RNS platforms. Each HP750 has Emulex hardware cards, with multiple interface ports to 9.6 kilobits-per-second communications circuits (point-to-point), connecting the local HP communications server to the remote DOE processor. In addition, SSI 3270 software runs on each HP750 as the software driver for the Emulex hardware cards, emulating a 3174 IBM-type control unit to the DOE processor.

Until 1999, the HP 750 communications servers ran HP-UX 9.5, which was not certified as Year 2000 Compliant. This operating system software could not be upgraded to be Y2K compliant because of a dependency on the SSI 3270 software. After evaluation of several high cost hardware solutions to the Y2K issue, Andersen Consulting performed extensive testing on the HP750's to ascertain if any critical date-dependent problems would result from the system clock rolling forward into year 2000, or from any external system interfaces. No problems were found, and a decision was made to keep the HP 750's (with HP-UX 9.x) until DOE functionality replacement is achieved with future development.

2. Data Management and Movement

The data management and movement segment involves the definition of architecture in the following areas: hardware data storage, database management software, data replication, and data transfers.

There are 40 production database servers in RNS. The sites are divided into Tier 1, Tier 2 and Tier 3 based on size (number of reps). The Tier 1 sites have two database servers in each location (except for Miami, which has 4), and the Tier 2 and Tier 3 sites share 8 database servers that are in the data centers. There are four database servers in each of two data centers, Birmingham, AL and Charlotte, NC.

The main databases used by RNS are OASIS and OPI. There is one of each database on each of the 40 database servers. Currently the AMOS database is being unloaded from its production site and ftp'd to files in memory on each of the 8 data center servers. These in memory files are read by RNS.

The DBMS for RNS is Informix 7.30.uc5 and it runs under the Sun Solaris operating system 2.6.

There is one Informix online (instance) running on each database server. The OPI and Oasis databases both are in the same online. Each database has its own dbspace. There is a cron job that runs nightly to reorganize the OPI database, and that also runs an Informix backup of the databases. The databases are backed-up using the Informix tool 'ontape', and the logical logs are backed-up using the alarm program which uses the Informix tool 'ontape'.

The archive of the database is overlaid each night with the current backup, if successful, and the logical log backups from the previous day are deleted. The database can be restored back one day. There are no off-site database backups for the Tier 1 sites. The database servers in the Data Centers have Unix system backups being done daily using the CAM process.

The OASIS database consists of 18 tables that are rebuilt and reloaded in a temporary database each night, and then a drop and rename of the OASIS database takes place if the load is successful. The datafiles for this load are retrieved by ftp twice each night from the OASIS hubs, which are located on the 8 Data Center database servers. The data on the hubs is populated nightly from several mainframe applications (COFFI, ATLAS, CRIS, and FUEL). The datafile transfers from the hubs to the database servers, and the database loads, are all controlled by cron jobs. OASIS is a read only database. Since all datafiles are retained on the hub and on the database server, the oasis database server can be reloaded instead of being restored by running a load script.

The OPI database is also known as the Resend database. There are three tables in the OPI database. Service orders and other types of contracts are stored in this database if they cannot automatically be sent to the mainframes in real time. OPI will try to send each contract up to 10 times. If this fails, the application group has a tool called RTOC-tool, that checks each server daily for contracts and tries to resend again. The OPI database is logged in Informix and the data is important. Every effort should be made to retain or restore this data from the database backup and logical log backups.

3. Network

The network segment of the technical architecture can be described as the set of services that is provided by the network infrastructure including LAN (Local Area Network) and facility backbones, WAN's (Wide Area Networks), external business partner access, host communications, mobile access, telecommuter/small office access and public external information access.

The Network Infrastructure for RNS provides the LAN (Local Area Network) and WAN (wide area network) that allows users to access local servers for applications and services, and for the users and local applications to access applications and services across the BellSouth region on the BOSIP network (BellSouth Open Systems Interconnect Platform). BOSIP is the region-wide TCP/IP routed network for data communications (BellSouth intranet). The main points of concentration for the communications links are the 6 Regional Data Centers/Communications hubs (Birmingham, Nashville, Jackson, Charlotte, Atlanta, and Miami), with interconnecting broadband trunk facilities.

There are 3 main network models for RNS, and these are diagrammed in Appendix C. These are the Tier 1 site model (multi-hub, T3 WAN), the Tier 2/3 site model (multi-hub, T1 WAN), and the simplest Tier 2/3 model (single hub solution). The Tier 1 sites are located within large multi-department buildings, and follow a shared LAN/WAN infrastructure model (Building Information Transport System, or BITS) that includes a specific IP addressing scheme (255.255.240.0 bitmask). All RNS sites use the following data communications products: NortelNetworks routers, and Cabletron SmartSwitch LAN hubs.

The WAN topology for RNS uses NortelNetworks routers within the local Consumer offices to interconnect the LAN to the backbone network, the wide area trunk facilities connecting the LAN to the BOSIP concentration point within the closest data center, and the BOSIP backbone network for data connections between data centers. RNS always uses 2 routers at each location for redundancy (primary and secondary), each with their own WAN trunks to the BOSIP network. Typically, the RNS servers have their default gateways set to use the primary router, and a backup procedure is used to connect to the secondary router if the primary router/trunks fail. The wide area trunk facilities from each site into BOSIP would include a primary T3 (45 mbps) circuit with backup T1's (1.544 mbps), or multiple T1's.

The LAN wiring topology uses unshielded twisted pair (UTP, Category 5) wiring for the horizontal wiring from the desktop terminal to the first LAN hub, either in the closest wiring closet or resource room. These currently are utilized for 10 megabits-per-second (mbps) switched Ethernet communications under the 10Base-T specification, but the wiring and patch panels have the capability to make the transition to 100 mbps in the future (with the exception of approximately 15% of the sites that have Category 3 rated unshielded twisted pair wiring infrastructure). For multi-hub configurations, the first hub from the desktop device ("floor" hub or "distribution" hub) may be connected, along with other distribution hubs, to a single concentrator hub with multiple fiber connections. The concentrator hub interconnects the distribution hubs (with the desktop connections) with the server connections, and the router connections (WAN access). A single hub solution, for small locations, may incorporate the desktop connection and router/server connection functions into a single hub. The local server connections into the concentrator hub are configured for 100 mbps Fast Ethernet (FE). The connections from the concentrator hub into the routers is configured for 100 mbps (either Fast Ethernet or FDDI).

Cabletron Systems is the manufacturer of the LAN hardware and hubs used for RNS. The hubs are from their SmartSwitch product line, which incorporates Ethernet switching (on a port basis), which avoids the performance degradation from data collisions of shared media Ethernet. The hub chassis used include SS9000 (6 or 14 card slots), and SS6000 (5 slot). The card slots support various wiring media, protocols, and port densities. Details for the RNS implementations are again found in Appendix C. The chassis used support multiple hot-swappable power supplies.

NortelNetworks is the manufacturer of the TCP/IP routers used for RNS. There are two size chassis used: the Backbone Concentrator Node (BCN) and the Backbone Link Node (BLN-2). The BCN has capacity for 13 interface card slots, and the BLN-2 has 4. The routers support interface cards for several LAN (Ethernet, fast Ethernet, FDDI), and WAN (PPP, ATM, SMDS) protocols. The same interface cards can be used in either chassis. The backbone type chassis incorporate several high uptime features, including redundant power supplies, and the ability to hot swap the interface cards. Every field router should access AC power through an Uninterruptible Power Supply (UPS) with surge protection, and should be accessible with a remote console connection via the Datakit network ("out of band") for remote administration.

4. Network-Based Services

Network based services are the basic communications and utilities that are provide to users resident on the Bellsouth Networks, including file and print services, electronic messaging/collaborative computing, address and directory services, and web services. Domain Naming Services (DNS) is the standard name resolution technique in this segment, but RNS is prevented from using this extensively due to logical name routing constraints within the Navigator infrastructure. Lists of dedicated servers/hosts, requiring communications sessions with RNS, are kept within host tables (/etc/host directory). Messaging products used within the RNS environment include HP OpenMail and Priority Messaging. OpenMail is the primary electronic mail client currently provided for the service reps. A probable migration path to Microsoft Exchange will be studied in the future. Priority Messaging is a fast-response, client/server messaging system used to broadcast urgent messages to service reps across BOSIP (like current system problems or RNS defects being investigated). Priority Messaging is a BellSouth developed product.

5. Network and Systems Management

Network and Systems Management functions are the implementation of processes and tools needed to monitor, manage, and control BellSouth's computing infrastructure. These tools are used by the EDS and Andersen Consulting to manage RNS systems and ensure proper performance. Some prominent Systems Management tools used to manage the RNS application are Computer Associates TNG (distributed systems/applications management), Best 1 (platform performance monitoring), and DiskSuite (disk management utility). The BOSIP data network, supporting the distributed RNS application, utilizes a standard set of network monitoring tools utilizing the Simple Network Management Protocol (SNMP) and MIB-II (Management Information Base), which specifies groups of managed network objects.

6. Application Technical Environment

The application technical environment architecture segment involves the definition of a common architectural framework to be used by soft ware systems to interact with application components and data resident on other core platforms. RNS makes extensive use of Navigator, which is a BellSouth proprietary infrastructure service designed to provide data contract request routing, data conversion and transport, and certain error recovery and event tracing functions. The Navigator also provides an API that allows application developers to write software that invoke or respond to contracts. A Navigator brokering functionality is used by RNS to distribute server requests to servers within assigned pools, thereby doing load-balancing functions.

7. Document Management

The document technology segment is comprised of the services for digital content management which include authoring/publishing, repository, and delivery services. Within the RNS environment and desktop, access is provided to the Orbit system for online documentation and training materials. The reps are each provided access to a Netscape browser client from the boot/desktop servers (Unix), for accessing the remote Orbit web servers located within the Data Centers.

8. Security

The Security segment defines the infrastructure technology needed to support BellSouth's security policy. This set of services includes authentication and authorization, perimeter access control, confidentiality, virus control, audit and detection, and security management.

RNS utilizes the standard BOSIP security architecture for authentication, authorization, and auditing functions. The three main components of this are the Access Control Profile (ACP), Account Registry, and the network's security password authentication service (Kerberos). For each security cell (logical user grouping), at least two servers (primary and secondary) are set up as cell servers. These contain security software (loaded from the "AAA" DDS package) as well as the cell databases for the ACP and Registry. The cell servers handle all security functions for all the other servers within the cell. In order to use the RNS application, a user must have an established profile in the ACP, an account in the Account Registry, and a Kerberos password. After the BOSIP Security group builds the initial profiles for the management personnel, Local Coordinators are responsible for building the user accounts for the non-management people. A software tool called "BSSadmin" is used for profile administration. With this tool, the Local Coordinator will assign temporary passwords, reset passwords, establish ACP authority, and establish accounts in the Account Registry. Global level (corporate wide) security servers are maintained as master copies of security profiles kept in all the cell servers.

9. Development Environment

The Application Development Architecture describes the tools, processes, methods, design standards and organization structures that are required to develop application software by, or on behalf of BellSouth. The RNS application is maintained by the Andersen Consulting - Customer Operations Application Group. The application is primarily written in the C language. The following development tools are used:

Sun: Workshop 4.2, answerbook 2 v1.4

Rational: purecov-4.5.1-solaris2, purify-4.5.1-solaris2, quantify-4.5.1-solaris2

FreeWare-Non Licensed: vim 5.6, xemacs 20.4, tcl/tk 8.1.1, perl 5.005.03

APPENDIX A

RNS LOCATIONS AND HARDWARE SUMMARY

- **Tier 1 locations**
- **Tier 2 & 3 locations (2 pages)**

TIER 1 LOCATIONS

Site	Total externs	Total PC's	Boot Server	App Server	DB Servers	Address
Miami	957	71	17	21	4	600 NW 79th Ave.
Ft. Lauderdale	488	30	9	11	2	6451 N. Federal Hwy
Nashville	333	27	8	8	2	333 Commerce St.
Jacksonville	384	14	5	6	2	301 W. Bay St.
Bham	369	47	7	8	2	3196 Hwy 280 So.
Charlotte	284	8	6	8	2	4100 South Stream Blvd.
Louisville	273	17	6	7	2	534 Armory Pl.
Columbia	226	0	5	5	2	400 Laurel St.
Conyers	230	0	4	5	2	1447 Parker Rd.
New Orleans	240	12	4	5	2	365 Canal St.
Greensboro	198	0	4	5	2	2200 Pinecroft Rd.
Orlando	186	0	4	4	2	500 N. Orange Ave.
BSC-Atlanta	279	0	5	5	2	675 W. Peachtree St.
Jackson	219	11	5	5	2	175 E. Capitol St.
Total Tier 1	4666	237	89	103	30	

Tier 2 & 3 Locations (p. 1 of 2)

Site	Total Xterms	Total PC's	Boot Serve	App Server	DB Servers	Address
West Palm	211	11	3	3	0	2021 S. Military Tr.
Montgomery	159	21	2	3	0	38 Washington St.
Charleston	147	0	3	3	0	385 Meeting St.
Shreveport	143	8	3	3	0	3115 Dee St.
Rome	132	0	3	3	0	707 E. 2nd Ave.
Baton Rouge	142	10	3	3	0	One American Pl.
Memphis	125	7	2	2	0	1544 Madison St.
Lafayette	134	8	3	3	0	901 Hugh Wallis Blvd
Asheville	120	1	3	4	0	24 O'Henry Ave.
Chattanooga	119	9	2	3	0	300 ML King Blvd
Pensacola	116	0	2	3	0	606 W. Garden St.
Greenville	121	4	2	2	0	218 College St.
Austell	123	0	3	3	0	351 Thornton Rd.
Paducah	105	8	2	2	0	810 Kentucky
Gainesville	105	0	3	3	0	903 W. University Ave.
Kennesaw	110	0	2	3	0	400 Chastain Circle
Columbus	107	0	2	3	0	1324 Veterans Pkwy
Athens	99	0	2	3	0	125 Reese St.
Ft. Pierce	93	0	3	3	0	3300 Okeechobee Rd.
Albany	101	0	2	3	0	304 Pine Ave.
Augusta	98	0	3	2	0	440 Walker St.
Savannah	97	0	2	2	0	6602 Abercorn St.
Macon	98	0	2	2	0	1630 Eisenhower
Daytona	86	5	3	4	0	900 N. Nova Rd.
Monroe	86	4	3	4	2	301 Catalpa St.
Tuscaloosa	76	4	3	3	0	2102 7th St.
Wilmington	78	1	3	3	0	3809 Shipyard Blvd.
Clarkesville	75	5	3	4	0	417 Madison St.
Lawrenceville	70	0	3	3	0	330 Oak St.

Tier 2 & 3 Locations (p. 2 of 2)

Site	Total Xterms	Total PC's	Boot Serve	App Server	DB Servers	Address
Jackson	91	12	2	3	0	447 E. Main St.
Mobile	76	6	3	4	0	3103 Airport Blvd.
Decatur	67	7	3	3	0	425 Grant St.
Houma	75	4	2	2	0	425 Roussel St.
Alexandria	68	6	3	3	0	825 Murray St.
Covington	67	4	3	3	0	205 Holiday
Hattiesburg	55	5	2	3	0	100 Brunie St.
Lake Charles	57	3	3	3	0	2827 Fourth St.
Gadsden	65	3	3	3	0	820 S. 4th St.
Valdosta	53	0	2	2	0	200 W. Valley St.
Tupelo	57	5	3	2	0	420 W. Main St.
Meridian	52	5	2	2	0	2525 44th St.
Panama City	53	0	2	2	0	1000 W. 15th St.
Columbia	65	5	3	4	0	112D E. James Campbell Blvd.
Raleigh	52	1	2	2	0	5715 Glenwood Ave.
Greenwood	44	2	2	2	0	210 George St.
Training Ctr	40	0	2	2	0	2295 Park Lake Drive
Ga Staff	7	0	1	0	0	125 Perimeter Center
EPLC		0	1			
Total Tier 2/3	4320	174	119	130	2	
Total	8986	411	208	233	32	

APPENDIX B

RNS SERVER SPECIFICATIONS (SUN E3500)

5 Slot Enclosure (includes 1 I/O board)

FUNCTION: BOOT/DESKTOP

	Tier 1	Tier 2, 3
CPU's (336 Mhz)	4	2
Memory (Gb)	2	1
Disk (Gb) - internal	18 (2 x 9 Gb)	18 (2 x 9 Gb)
Size	25.5 " H x 17" W x 23.5" D	(same)
Weight	160 lbs. (approx)	(same)
AC Power (100-240 VAC)	9.5 amps (750 Watts)	(same)
Heat dissipation	2560 BTU/hr	(same)

FUNCTION: APPLICATION

	Tier 1	Tier 2, 3
CPU's (336 MHz)	4 (6 in large office buildout)	2
Memory (Gb)	2 (3 in large office buildout)	1
Disks (Gb) - internal	27 (3 x 9 Gb)	27 (3 x 9 Gb)

FUNCTION: DATABASE

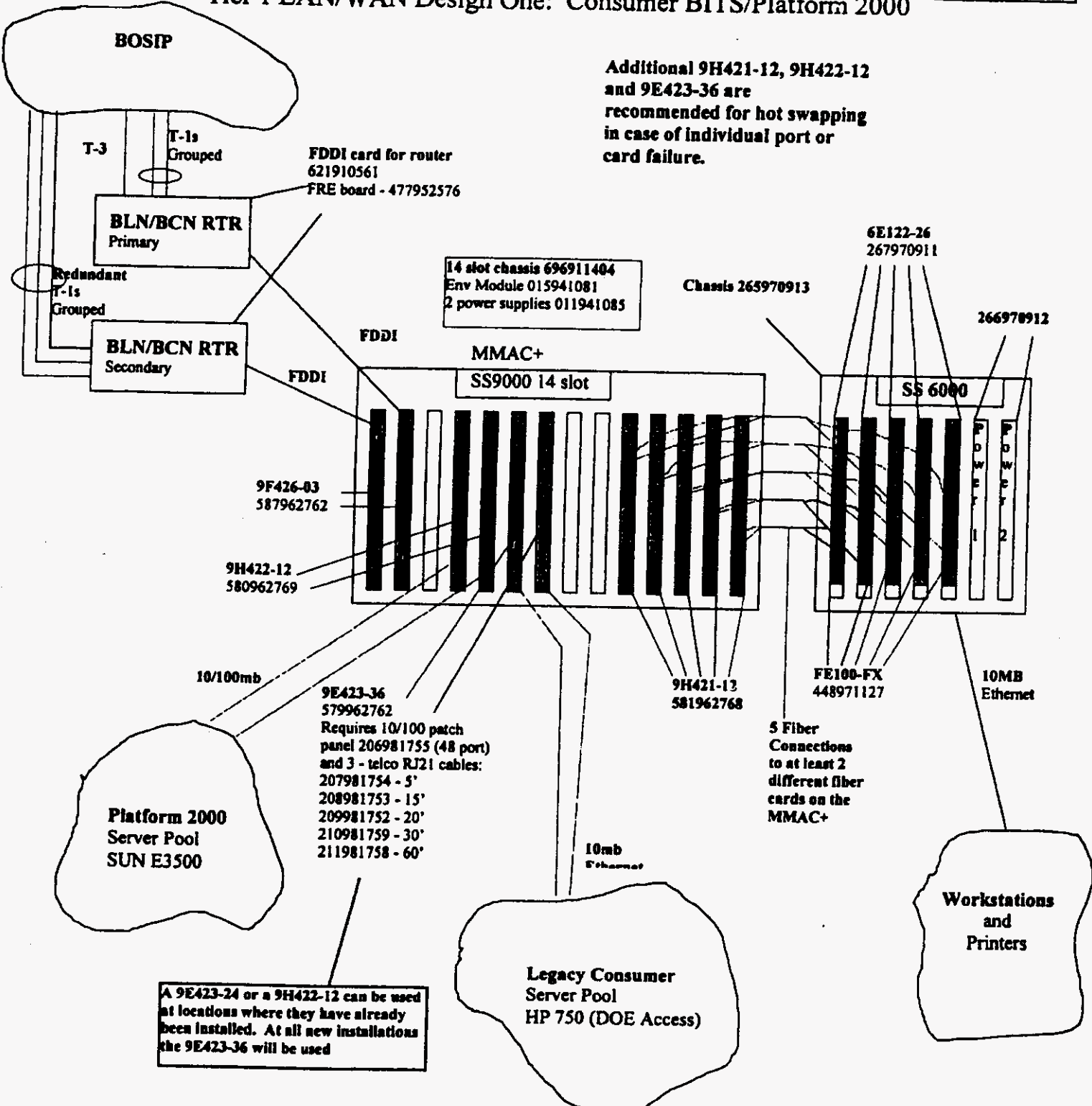
	Tier 1	Tier 2, 3
Location	Local (with application Server)	Data Center (4 Charlotte, 4 Birmingham)
CPU's (336 MHz)	4	4
Memory (Gb)	2	2
Disks (Gb) - internal	45 (5 x 9 Gb)	45 (5 x 9 Gb)

APPENDIX C

LAN CONFIGURATION DRAWINGS

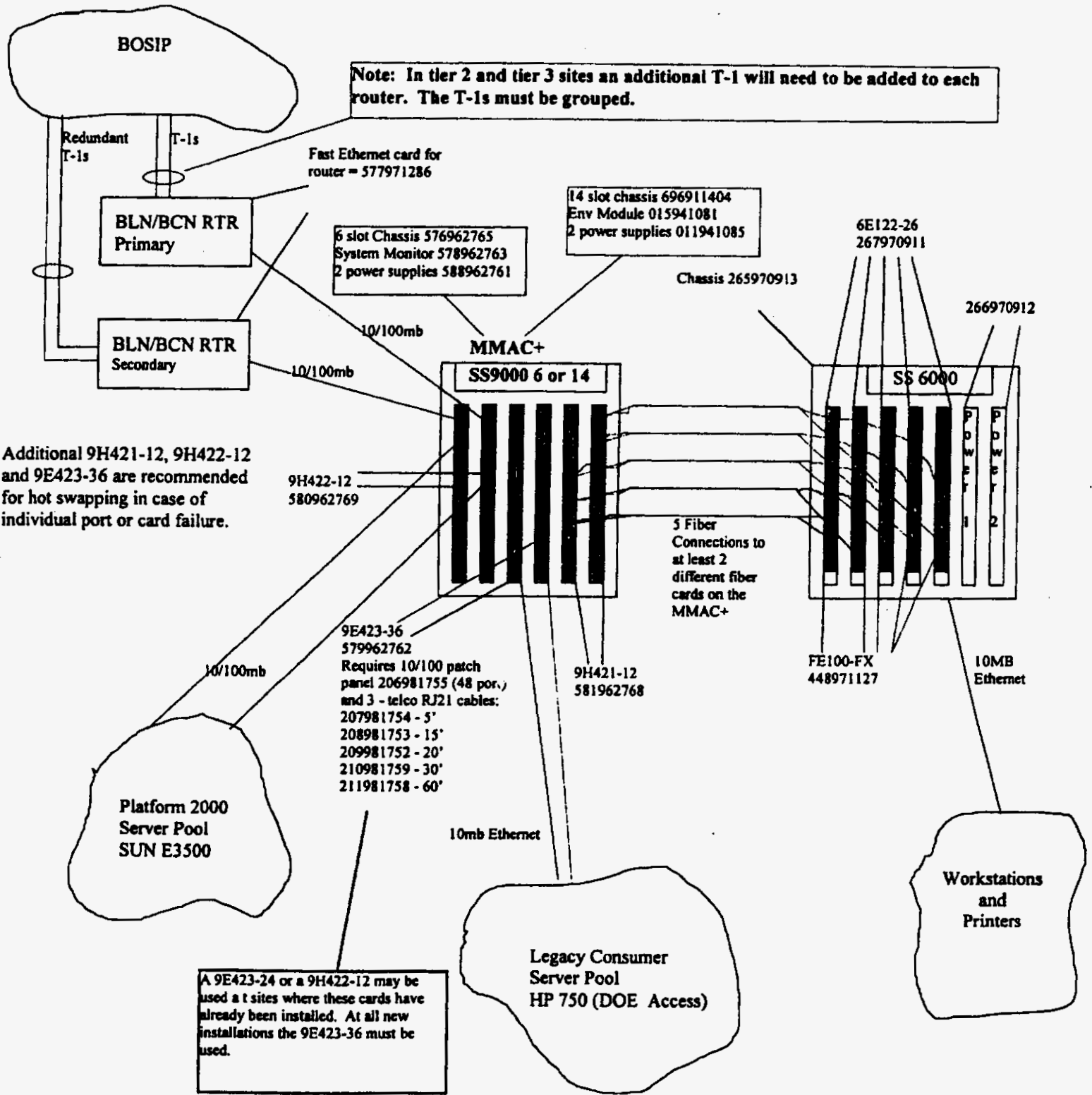
- **Tier 1 Multi-hub, T3 WAN Connection**
- **Tier 2 & 3 Multi-hub, T1 WAN Connections**
- **Tier 2 & 3 Single hub, T1 WAN Connections**

Tier 1 LAN/WAN Design One: Consumer BITS/Platform 2000



Additional 9H421-12, 9H422-12 and 9E423-36 are recommended for hot swapping in case of individual port or card failure.

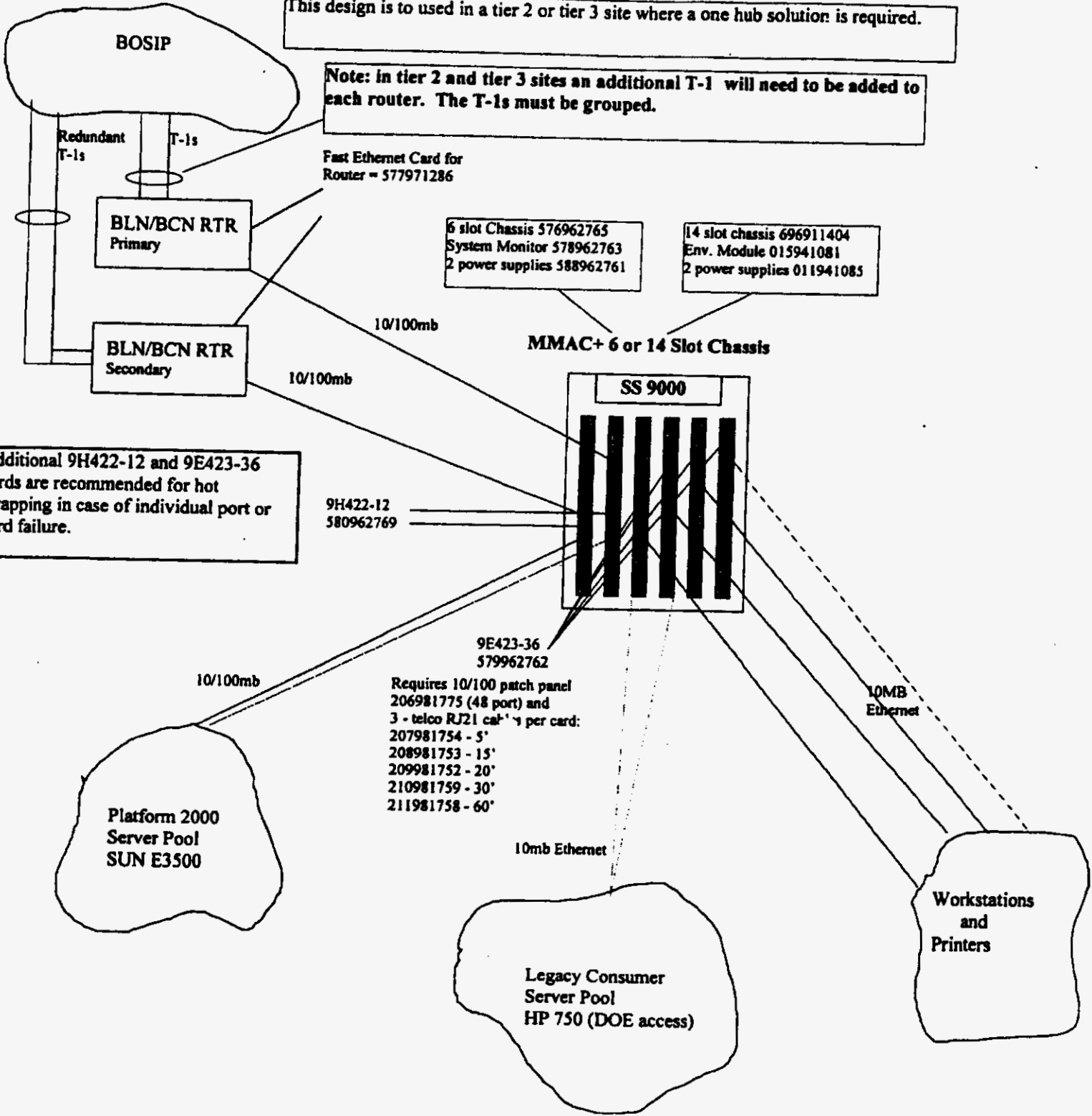
Tier 2 and Tier 3 LAN/WAN Design One: Consumer BITS/Platform 2000



Tier 2 and Tier 3 LAN/WAN Design Two: Consumer BITS/Platform 2000

This design is to be used in a tier 2 or tier 3 site where a one hub solution is required.

Note: in tier 2 and tier 3 sites an additional T-1 will need to be added to each router. The T-1s must be grouped.



Additional 9H422-12 and 9E423-36 cards are recommended for hot swapping in case of individual port or card failure.