LOAD BALANCE
DESCRIPTION
NETWORK ADMINISTRATION
NO. 1/1A "ESS*" SWITCHES

CONTENTS PAGE

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CONTENTS PAGE

1. GENERAL

1.01 This section describes the procedures and methods for computing the Load Balance Index (LBI) for No. 1 and 1A ESS switches.

1.02 This section is being reissued to delete references to manual load balance procedures and forms. The procedure for reporting of the LBI to American Telephone and Telegraph (AT&T) is also eliminated with this issue. Additional revisions to this section include deletion of information that is common to all switching systems. This information is now included in Section 780-350-050. This section provides a new index table that more accurately provides a relationship between the LBI and the grade of service being provided by the switching machine. Further highlighting of poor service is provided by a

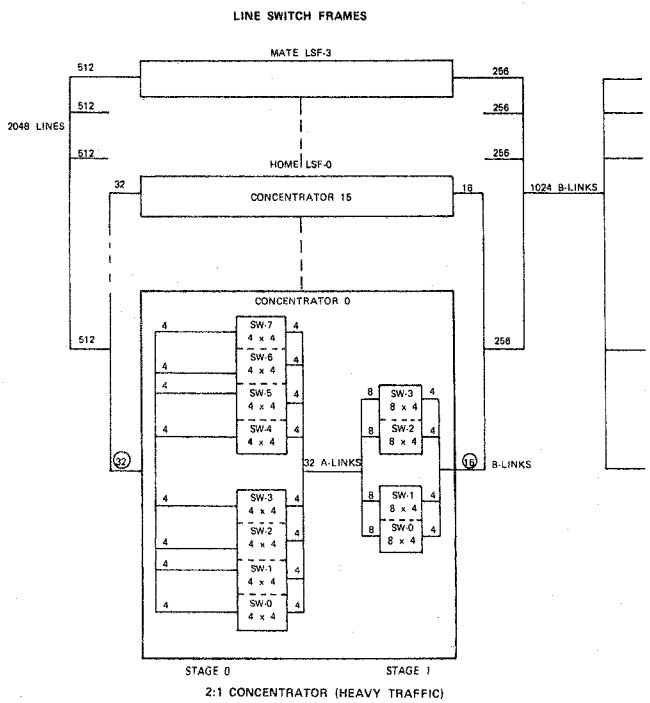
special "hot spot" classification. A load unit is labeled a "hot spot" when its 10 hour weekly average load, for load balancing, exceeds a predetermined threshold value. The threshold values are provided later in this section.

2. LOADING CONSIDERATIONS LOAD UNIT CONFIGURATION

LOAD UNIT CONFIGURATION

2.01 The load unit in a No. 1/1A ESS switch is the concentrator. A concentrator consists of two stages of switching that concentrate and distribute the traffic over various paths. Two levels of concentration (ie, 2:1 and 4:1) can be provided in No. 1/1A ESS switches.

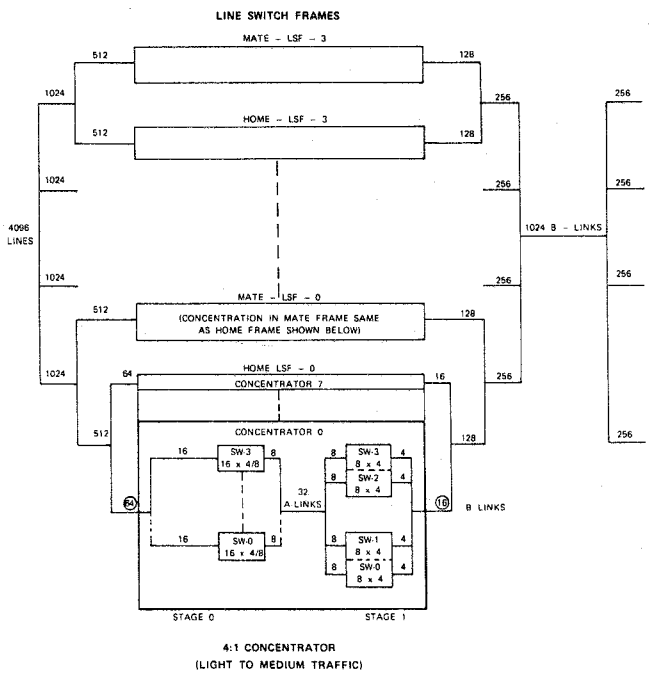
2.02 The 2:1 concentrator serves up to 32 customers. As the following illustration shows, these 32 customers have access to 16 B-links. Each concentrator contains eight 4-by-4 stage 0 switches and four 8-by-4 stage 1 switches. Stage 0 switches do not provide any concentration and are used only to distribute traffic over the stage 1 switches. Stage 1 switches provide the 2:1 concentration and distribute the traffic over the 16 B-links. The B-links, in turn, are distributed in a patterned manner over the line junctor switch frames within the network. No concentration occurs in the line junctor switch frames.



2:1 CONCENTRATOR (HEAVY TRAFFIC)

2.03 The basic measured balancing unit is a concentrator. However switch balance in a 2:1 network is important. Although concentration does not occur in stage 0, class-of-service distribution by switch within a concentrator is necessary. Large numbers of the same class of service in one switch will increase the probability of blocked dial tone. Further blockage can also occur in stage 1 or at the B-links.

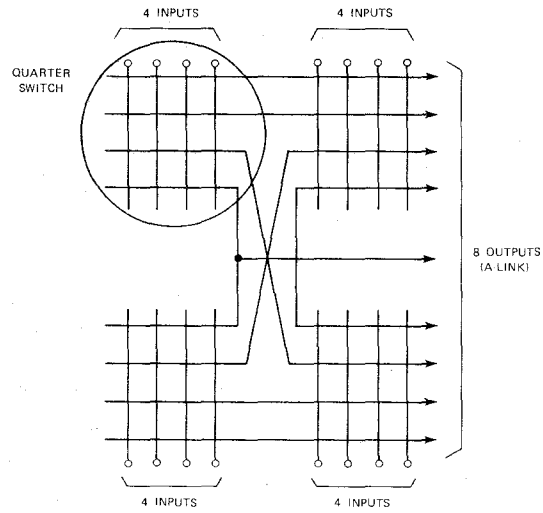
2.04 The 4:1 concentrator serves up to 64 customers. The following illustration shows how these customers access the 16 available B-links. Each concentrator contains four 16-by-8 stage 0 switches and four 8-by-4 stage 1 switches. Stage 0 switches perform a 2:1 concentration function and distribute the 32 paths over the stage 1 switches. Stage 1 switches also perform a 2:1 concentration function and distributed in a specific pattern across the line junctor switch frames within the network. No concentration occurs in the line junctor switch frames.



4:1 CONCENTRATOR
(LIGHT TO MEDIUM TRAFFIC)

2.05 The basic balancing unit in the 4:1 network is also the concentrator. However, concentration occurs in both stages; hence blockage may occur in both the A- and B-links. The A-links are particularly load sensitive because of the quarter-switch arrangement as shown in the following illustration. Study of the figure demonstrates that a poor distribution by class of service over the quarter-switches could result in blockage. The blockage could occur even though

from an overall hundred call seconds (CCS) load standpoint the concentrator could be underloaded.



STAGE 0 IN 4:1 NETWORK

CLASS OF SERVICE

2.06 A good spread by class of service is also important in maintaining good balance. Using load measurements alone could lead to poor class-of-service mix which could result in irregular variations in concentrator load. Best use of line equipment can be obtained by including good load distribution with class-of-service spread. This procedure should result in load variations being spread across all the concentrators in an office.

LOADING DIVISIONS

2.07 Normally the line equipment in a No. 1/1A ESS switch will consist of one loading division. Separate loading divisions (parent and child) can be created when there has been a recent addition or when networks have been marked for removal from a control group.

2.08 Parent and child loading divisions are indexed separately. This eliminates any unnecessary LBI penalties. A child loading division created because of an addition can be indexed separately as follows:

- A period up to 6 service evaluation months
- Until the line equipment reaches 30 percent of capacity.

When the child loading division reaches the sixth service evaluation month, it must be folded into the parent loading division.

2.09 A child loading division may also be created when line equipment has been designated for removal from a control group. A removal child does not have a time constraint. However, deloading of the line equipment should be accomplished as quickly as possible.

LINE LINK NETWORK MODIFICATIONS

2.10 If an existing line link network (LLN) configuration is unsatisfactory because of equipment utilization or service, the existing arrangement can be modified. The options available to modify a network configuration in a working office are a B-link concentration ratio change (BCRC) and/or the mixed concentration ratio (MCRC) feature. A BCRC changes the existing line to junctor ratio to any other standard line to junctor ratio. This change must be within the existing design, either regular or heavy, of line concentration (ie, 2:1 or 4:1). The MCRC allows for a mixture of regular and heavy concentrators within the same office.

B-LINK CONCENTRATION RATIO CHANGE

2.11 The development of the BCRC allowed for better utilization of terminal or CCS capacity. The BCRC only changes the line-to-junctor ratio (LJR). The LJR may be changed in an upward or downward direction. If a change is upward to a higher ratio additional line switch circuits ***may be added*** to each existing LLN. A downward BCRC to a lower LJR ***requires the removal*** of one or more line switch circuits from the existing full LLNs. Each LJR has a unique wiring pattern associated with it and that pattern must be changed when the LJR is changed. Therefore the B-links will always be rewired regardless of the direction of the BCRC.

2.12 A BCRC must result in a LJR that is currently rated as standard. Table A contains the current rating of all LJRs. The exception to this rule is the change of any existing heavy ratio to the 4:1H ratio. The 4:1 is not standard and this exception is ***only*** allowed when performed in conjunction with an MCRC. Therefore for 2:1 (heavy) concentrator offices, a BCRC can be made from any existing heavy ratio to the 2:1, 3:1, or 4:1 heavy LJR. For 4:1 (regular) concentrator offices, a BCRC can be made from any existing regular ratio to the 4:1 or 6:1 regular LJR.

2.13 Examples of upward and downward BCRCs are provided in Fig. 1 and 2. In Fig. 1 a 4:1R to 6:1R BCRC is performed. This allows line switch circuits (LSC) 4 and 5 to be added to each LLN. Because the BCRC is in an upward direction, the addition of the new LSCs need not immediately follow the BCRC but can be postponed indefinitely. Figure 2 illustrates a downward BCRC from 6:1 to 4:1 and the required removal of LSC 4 and 5 from the existing LLNs. In this example, the LSCs are retained and along with new junctor switch circuits (JSCs) create two new LLNs.

2.14 All BCRC modifications are divided into steps that sequentially change the linkage pattern until the B-link pattern agrees with the new LJR. Each wiring step is accompanied by a parameter update that modifies the B-link parameter information to reflect the current state of the wiring changes. During each step there is a reduction in network switching capacity because one or two junctor switch circuits are removed from service for the duration of that step. Therefore BCRCs must be scheduled for low traffic periods. As long as the wiring steps are completed during low traffic periods there should not be any degradation of service.

2.15 The BCRC capability has introduced the possibility of fractional networks in a No. 1/1A ESS switch. If an upward BCRC has been performed, it is not necessary to fill out all the networks to the complement required by the new LJR. Only the equipment required to meet the demand for the engineering period need be added coincident with the BCRC. If more than one fractional network appears as a result of this operation, the following recommendation should be considered. Only one size fractional network should exist in an office and all line switch circuits should be engineered at the same CCS capacity. Multiple loading divisions should not be considered.

MIXED CONCENTRATOR RATIO FEATURE

2.16 The MCRC feature allows an office to operate with a mixture of heavy and regular concentrators. That is, this feature allows an office that is currently working with a heavy (2:1) concentrator LJR to grow with less expensive regular traffic (4:1) concentrators. Economic aspects must also be weighed when considering inclusion of the MCRC feature with an equipment addition.

2.17 Unlike the BCRC, the MCRC feature in itself does not require any modifications to the ex-

isting LLN equipment. When adding to an office a LLN that has a different type (ie, regular versus heavy) line switch or a different B-link ratio than the existing LLNs, then the MCRC will be used automatically.

2.18 If an MCRC is implemented in an office, the original LLNs should be administered utilizing one of the two options that follow:

(a) Leave the existing heavy LLNs as they are and treat them as fractional, 4:1R LLNs. For example, if the heavy LLNs were of the 3:1H type, these would become 3/4 equipped 4:1R LLNs (from a CCS capacity standpoint) coincident with the MCRC. If the heavy LLNs were of the 2:1H type, these would be treated as though they were 1/2 equipped 4:1R LLNs coincident with the MCRC. It should be noted that, under these arrangements, all fractional networks added on subsequent growth jobs must be the same size fractional as the heavy concentrator networks, since more than one size fractional network in an office is not recommended. In any case, the CCS capacity per terminal of the remaining heavy networks must be the same as the CCS/terminal capacity of a 4:1R LLN coincident with MCRC implementation. Referring to Table A it can be seen that the CCS capacity per terminal of a 4:1R LLN is 3:59 CCS. All existing heavy concentrator networks, regardless of size, now must be engineered to this capacity.

(b) In some cases, it can be economically feasible to BCRC the existing heavy LLNs to the 4:1H LJR (if they are not at that ratio already). This arrangement has the advantage of building out the heavy networks to their "full" size (4:1H and 4:1R networks have identical terminal capacities), thus allowing for any standard size fractional network on subsequent growth jobs. As mentioned in (a), a single loading division must be maintained for the LLN. Therefore, the CCS/terminal capacity of the 4:1H LLNs is equal to the CCS/terminal capacity of the 4:1R (3:59 CCS per Table A) LLNs.

FEATURE RESTRICTIONS

2.19 There are two restrictions that affect the location of office equipment assignments.

2.20 Lines classified as essential are assigned to levels reserved for class A line load control. The number of levels needed will vary with office parameters and is fixed in the parameter area of the program store. The following provides an illustration of the switches and levels required for each percentage of class A equipment.

2:1 TYPE CONCENTRATOR		
%LLC EQUIP'D	SW. NO	LEVEL
6.25	1,5	00
12.50	1,2,5,6	00
18.75	1,2,5,6	00
	3,7	03
25.00	0,1,2,4,5,6	00
	3,7	03
4:1 TYPE CONCENTRATOR		
%LLC EQUIP'D	SW. NO	LEVEL
6.25	0,1,2,3	04
12.50	0,1,2,3	04,08
18.75	0,1,2,3	04,08,15
25.00	0,1,2,3	04,08,15,00

2.21 Ground start is required for certain operations such as coin lines (except dial tone first) and some types of PBX direct dial trunks. Only ***even numbered equipment levels*** should be used for ground start lines. Levels should be preselected and wired for ground start service. Assignments should then be made accordingly. Additonal levels may be wired if demand for ground start service increases.

DISTRIBUTING FRAME CONSIDERATIONS

2.22 The main distributing frame (MDF) provides a means of flexible assignment of cable pairs to line equipment. Although MDF considerations are not directly related to load balance, a poor distribution of line equipment or cable can limit access to certain portions of line equipment by causing frame congestion. Similarly, a poor or random assignment policy can create frame congestion by increasing jumper length.

2.23 To eliminate or limit frame congestion problems as mentioned in the preceding para-

graph, the initial layout and subsequent addition of cable and line equipment should be planned to provide optimum use of short jumpers without sacrificing load balance. The degree of planning required will vary with the type of MDF as well as the nature and size of the community being served. Large urban areas with high service order activity and serving several switching entities within a central office will require extreme care with MDF design.

2.24 A well engineered layout of cable pairs and line equipment along with reasonable preferential assignment procedures should result in optimum short jumper assigments. Establishment and maintenance of interdepartmental coordination is required to maintain long-range short jumper goals and continued good load balance.

2.25 If the criteria previously stated is adhered to, long jumpers should be kept to a minimum. Long jumpers will still occur because of cable transfer activity. These jumpers may be eliminated by the issuance of line equipment transfers (LETs). These may be scheduled to complete either before or after completion of the cable transfer. To and from (T and F) service orders within the same wire center, where dual service is not required, should be assigned a new equipment that will result in a short jumper.

2.26 The following paragraphs provide general information about the several types of main frames currently available.

2.27 ***Conventional Frame:*** The conventional MDF contains two major components. A vertical side that is used to terminate outside plant cable pairs and a horizontal side, consisting of shelves, terminates line equipment and directory numbers (where appropriate).

2.28 Conventional MDFs can be constructed in lengths up to several hundred verticals. Therefore, they are especially susceptible to long jumper problems. To control jumper length, large MDFs should be segregated into ***assignment zones***. The zones are the preferred areas of assignment for specified outside plant cables and central office line equipment. Local establishment of zones is necessary because of the variations in design and layout of conventional MDFs.

2.29 Establishment of zones should be an interdepartmental effort. The number of zones established should be the minimum required to control jumper buildup on the horizontal shelves. Further information appears in Section 680-830-010.

2.30 Successful MDF zoning requires that line equipments be made available in all zones as required to meet inward movement. If a conflict should exist between machine loading and short jumpers, ***service objectives will take precedence over MDF considerations.***

2.31 ***Modular Main Frame:*** Modular main distributing frames are designed for use in ESS offices. The frames are configured to be used with preferential assignment procedures which attempt to find the shortest cross-connections. The frame should only be used where approximately 95 percent of the jumpers can be expected to be made between adjacent verticals. Detailed descriptions of the frame can be found in Section 201-221-101.

2.32 The distributing frame module consists of ten verticals. Each pair of verticals is separated by a vertical jumper wire trough. The design is such that each outside plant vertical is adjacent to a line equipment vertical. Each file is considered to be divided into left and right half. A short jumper is defined as one that runs between terminals in adjacent half-verticals and thus lies wholly within a vertical trough. All other jumpers are defined as long jumpers. There are first- and second-choice long jumpers. The first choice is between terminals that may be separated by as many as ten verticals. The second choice is to run jumpers between terminals that are separated by ten or more verticals. Horizontal wiring troughs for running long jumpers are provided at the top and bottom of each frame. This trough space is ***limited,*** however, which makes it necessary to minimize long jumper assignments.

2.33 Although the design of the MDF is described as flexible, it requires many administrative controls to achieve its goal. The network administrator has two main concerns: to assign equipment preferentially by vertical and to maintain good load balance using the concept of spreading by class of service. These tasks are not small ones. The assignment lists should be prepared by MDF half-vertical and, when required, also by different classes of service.

2.34 Administering the assignment of equipment requires constant analysis of the load balance

results and careful surveillance of the records for long jumpers. Outstanding advance line equipment lists should be recalled by the administrator in order to withdraw line equipment that no longer meets specific load balance requirements.

2.35 ***Common Systems Main Interconnection Main Distributing Frame:*** The common systems main interconnection (COSMIC*) frame is a main distributing frame which terminates exchange cables and tie cables. It is associated with No. 1 ESS, No. 1 and No. 5 Crossbar, and Step-by-Step switching equipment.

2.36 The COSMIC frame lineup consists of alternating modules of line equipment and exchange feeder cable pairs. Each module has 11 shelves which provide each feeder cable pair access, with a short jumper, to line equipment modules located immediately to the left and right.

2.37 Each module has an upper and lower express trough for routing long jumpers and a large vertical trough between modules for routing short jumpers. A COSMIC frame short jumper is defined as that jumper which does not route via the upper or lower express troughs when making connections of line equipments with an exchange feeder cable pair.

2.38 Incorporated with the COSMIC frame system is a mechanized Program for Arrangement of Cables and Equipment (PACE) which provides an efficient and consistent layout of exchange feeder cable pairs, line equipment, and tie cable pairs.

2.39 The COSMIC frame design depends on preferential assignments which combine load balance and class-of-service requirements with short jumper concepts. The Computer System for Main Frame Operations (COSMOS) is the mechanized system designed to aid in achieving these goals.

3. LOAD BALANCE INDEX

3.01 This part provides the administrator with an insight into the manual calculations required to develop a load balance index (LBI). More detailed information regarding the mechanized Load Balance System (LBS) is also included in Part 4 of this section. Information of a general nature including statistical and philosophical background are included in Section 780-350-050. Normally No. 1/1A ESS switches will consist of one loading division. A recent addition of networks may result in parent and child loading divisions. These separate loading divisions should not exist for longer than 6 months. Removal child loading divisions do not have a time constraint. Further details are provided later in this part.

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MANUAL PROCEDURES

3.02 The following paragraphs provide an example of manual development of a LBI.

3.03 The first step in manual LBI development is to determine the engineered capacity (load) of each concentrator. The following illustration provides the engineered load (CCS/concentrator) for each concentration level.

LINE JUNCTOR RATIO	LSF/C PER LLN	CCS PER LSF/C	CONC. PER LSF/C	CCS PER CONC.*
Heavy	(Full)			
2:1	4	3,800	16	238
2.5:1	5	3,120	16	195
3:1	6	2,660	16	166
3.5:1	7	2,340	16	146
4:1	8	2,100	16	131
Regular				
4:1	4	3,680	16	230
5:1	5	3,020	16	189
6:1	6	2,580	16	161
7:1	7	2,260	16	141
8:1	8	2,040	16	127

*Engineered Load

3.04 The next step is to determine the average load carried by each concentrator. For this example assume that an office is equipped with 4 (4:1R) LLNs, 4 line switch circuit (LSC)/LLN, 16 concentra-

tors/LSC. Also assume that 10 hours of data = 391,390 CCS A-link usage. Then:

$$\text{Average Hourly Load} = \frac{\text{A-Link Usage}}{\text{No. Hrs. of Data}}$$

$$\text{Average Hourly Load} = \frac{391,390}{10} = 39,139 \text{ CCS/Hr}$$

$$\text{Average Load/LLN} = \frac{39139}{4} = 9785 \text{ CCS/LLN}$$

$$\text{Average Load/LSC} = \frac{9785}{4} = 2446 \text{ CCS/LSC}$$

$$\text{Average Load/Conc.} = \frac{2446}{16} = 153 \text{ CCS/Conc.}$$

3.05 To obtain the percentage of capacity of an office, divide the average load (AL) by the engineered load (EL) as follows:

$$\frac{AL}{EL} = \frac{153}{230} = 66.5\% \text{ Capacity (Round to 67\%)}$$

3.06 The next step is to determine the average holding time (AHT) of the calls creating usage on line equipments to obtain the AHT use one of the two following formulas:

$$\frac{\text{2 (L to L Junctor Usage) + (L to T Junctor Usage)}}{\text{Originating PC + Total of LLN PC + IAO PC}} \times 100$$

$$\frac{\text{A-Link Usage} \times 1.05}{\text{Originating PC + Incoming PC + IAO PC}}$$

3.07 The AHT should be calculated for each day and then an average for the week should be obtained. If data is lost and the average is less than 5 days, be certain that the data results in a good or reasonable holding time. If the data is questionable, then a recent previously computed AHT should be used.

3.08 The two items obtained in paragraphs 3.05 and 3.06 are used to obtain the quality control limit (QCL). The QCL is determined by using Table B and the following steps.

(a) Assume that the AHT developed from the formula in paragraph 3.06 is equal to 174 seconds.

(b) Under the AHT column in Table B, find 174 seconds. Note that it falls between 171 and 190 seconds.

(c) Find the percentage of capacity in Table B. To locate 67 percent (paragraphs 3.03, 3.04, and 3.05), turn to sheet 2 of the table (ie, 67 percent falls between 66 and 75 percent)

(d) Next locate the correct LJR under the previously identified capacity column (230, 4:1R).

(e) The QCL is read out from the juncture of the AHT line and the LJR column. For this example the QCL = 22.

3.09 Details of the use of the QCL in establishing the parameters of a normal distribution curve are provided in Section 780-350-050.

SCORE DEVELOPMENT

3.10 Use of a normal distribution curve and the related usage values can become awkward when dealing with large numbers and many concentrators. A scoring system has been developed to simplify the process. The scoring system takes the large usage values from the normalized curve and represents them with simple numbers. Each number is assigned to represent the distance each concentrator is from the average concentrator.

3.11 The numbers used in the scoring system are defined as follows:

(a) Each concentrator with exactly average CCS is assigned a score of zero.

(b) Each concentrator, either above or below average, up to and including 1.5 standard deviations (ie, one half the QCL) is assigned a score of either +1 or −1.

(c) Each concentrator, either above or below the 1.5 standard deviation previously defined but not exceeding 3.0 standard deviations is given a score of either +2 or −2.

(d) Each concentrator, either above or below 3.0 standard deviations from the average is assigned a score of +4 or −4. A 4 is used to point up those concentrators that are severely underloaded or overloaded.

PENALTY POINTS

3.12 The LBI is developed using a 3-month rolling average. The most recent results are weighted most heavily. This is done by assigning ***penalty points*** as follows:

(a) Concentrators are assigned three penalty points for a +4 on the current month's study.

(b) Two penalty points are applied to a +4 score on the preceding study

(c) One penalty point is given for a +4 score on the next preceding study.

Each concentrator can collect a maximum of six penalty points. The following provides an example of the use of penalty points.

	NOV.	DEC.	JAN.	TOTAL
Conc.A				
Study Score	+4	+4	+4	—
Penalty Points	1	2	3	6
Conc. B				
Study Score	+4	+1	+4	—
Penalty Points	1	0	3	4
Conc. C				
Study Score	−1	+4	+2	—
Penalty Points	0	2	0	2
Conc. D				
Study Score	+4	+1	−1	—
Penalty Points	1	0	0	1
Conc. E				
Study Score	−2	+1	+4	—
Penalty Points	0	0	3	3
Conc. F				
Study Score	+1	−1	+1	—
Penalty Points	0	0	0	0
Conc. G				
Study Score	+4	+2	+2	—
Penalty Points	1	0	0	1

PENALTY POINT FRACTION

3.13 The penalty points are totaled for a loading division and a ***penalty point fraction*** (PPF) is calculated. The PPF is determined by dividing the number of penalty points by the number of valid concentrators in the loading division as follows:

$$\text{Valid Concentrators} = 200$$
$$\text{Penalty Points} = 60$$
$$\text{Penalty Point Fraction} = \frac{60}{200} = 0.3$$

WEIGHTED PERCENTAGE OF CAPACITY

3.14 The percentage of capacity that an office is working at is used for the LBI. A factor is used to emphasize the most current data. The weighted capacity is obtained in a manner similar to penalty points. The following illustrates a weighted capacity.

	DEC.	JAN.	FEB.	TOTAL
Percentage of Capacity (Loading Division)	65	66	71	—
Weight	1	2	3	6
Total	65	132	213	410
Weighted Percentage of Capacity	—	—	—	68

RAW LOAD BALANCE INDEX

3.15 A raw LBI is obtained by entering Table C with the PPF and the weighted percentage of capacity (paragraphs 3.13 and 3.14). The raw LBI is found at the intersection of these two values. For example, an office at 68 percent capacity with a PPF of 1.46 has a raw LBI of 99.

HOT SPOTS

3.16 The raw LBI measures the state of balance of a given office. However, the raw LBI does not consider excessive overload conditions. Concentra-

tors with excessive usage are provided for by the introduction of hot spots. The hot spot concept establishes a threshold that equals a high probability of blocking. A concentrator with usage above the threshold is considered a hot spot. ***Hot spot penalty points*** are then assigned based on the performance of the concentrator.

3.17 Table D provides threshold values for all No. 1/1A ESS switch LJRs. The concentrator usage measurments for the current and two previous studies are compared to the proper threshold value. Hot spot penalty points are applied to the concentrators as follows:

(a) Concentrators are given three hot spot penalty points for a hot spot in the current month's study.

(b) Two penalty points are assigned for a hot spot on the preceding study.

(c) One penalty point is applied for a hot spot on the next preceding study.

(d) Furthermore, if a hot spot occurs for two consecutive studies, an additional penalty point is applied.

(e) If hot spot penalty points exist for all three studies, two additional penalty points are applied.

(f) Therefore, a concentrator can collect a maximum of eight hot spot penalty points.

3.18 Hot spot penalty points are accumulated for an entire loading division and a hot spot penalty point fraction is calculated. The hot spot PPF is obtained by dividing the number of hot spot penalty points by the number of measured concentrators in the loading division. An example of a hot spot PPF follows:

$$\begin{aligned}&\text{Measured Concentrators} = 300\\ &\text{Hot Spot Penalty Points} = 25\\ &\text{Hot Spot PPF} = \frac{25}{300} = 0.08\end{aligned}$$

3.19 The hot spot PPF is read into Table E and a hot spot correction is obtained. Using the example, a hot spot PPF of 0.08 converts to a hot spot correction of 3.

3.20 The hot spot correction factor is then subtracted from the raw LBI. The result is the LBI. For example:

$$\begin{aligned}&\text{Raw LBI} = 99\\ &\text{Hot Spot Correction} = -3\\ &\text{LBI} = 96\end{aligned}$$

3.21 If a No. 1/1A ESS switch has parent, and child loading divisions or has received an MCRC, the LBI calculations are somewhat different than the examples in the preceding prargraphs. The following paragraphs provide information on the different calculations.

MCRC OFFICES

3.22 Offices with MCRC are handled as one loading division. The engineered capacity for the heavy (2:1) ratio concentrators is taken to be one-half that of the regular (4:1) concentrators. The formula for establishing the office capacity follows:

$$\text{Loading Div. Capacity} = \text{EL*}\ \text{(No. 4:1 Conc.)} + \frac{\text{EL*}}{2}\ \text{(No. 2:1 Conc.)}$$

*EL = The engineered load CCS/concentrator from the illustration in paragraph 3.03

For example, if 4:1 concentrators are added to an existing 2:1 office, the capacity will be:

$$\begin{aligned}\text{Loading Div. Capacity} &= 230\ \text{CCS} \times 96 + \frac{230\ \text{CCS}}{2} \times 384\\ &= 22080 + 44160 = 66240\ \text{CCS}\end{aligned}$$

3.23 The percentage of capacity and the average holding times for MCRC offices are found in the same way as described previously (paragraphs 3.03 through 3.06).

QCL

3.24 The QCL for the 4:1 concentrators in an MCRC office is read directly from Table B. The QCL for the heavy (2:1) portion of the office is obtained by

multiplying the 4:1 QCL by 1.414. For example, if the 4:1 QCL in an office is equal to 22, then the 2:1 QCL will equal 22 X 1.414 or 31.

SCORES

3.25 The scores for the 4:1 and 2:1 concentrators are developed as described in paragraphs 3.10 and 3.11. However, the scores for each group of concentrators (each ratio) is developed separately using the respective QCLs.

PENALTY POINTS

3.26 Penalty points are determined in the same manner as previously described. However, the penalty points for each ratio will be added separately.

PENALTY POINT FRACTION

3.27 The PPF is calculated by using the following formula:

$$\text{PPF} = \frac{\text{No. of 4:1 Penalty Pts.} + 1/2\ \text{No. of 2:1 Penalty Pts.}}{\text{No. of 4:1 Conc.} + 1/2\ \text{No. of 2:1 Conc.}}$$

RAW LBI

3.28 The raw LBI for MCRC offices is obtained by entering Table C with the weighted percentage of capacity and the weighted PPF obtained in the preceding paragraph.

HOT SPOTS

3.29 Obtain the threshold value for each ratio in the office from Table D. Apply the hot spot penalty points in the same way as single ratio offices.

3.30 Count the number of hot spot penalty points assigned to regular concentrators and to heavy concentrators. The hot spot PPF is obtained by weighting the points assigned to the concentrators. The MCRC hot spot PPF is found as follows:

$$\text{Hot Spot PPI} = \frac{\text{No. of Reg. Hot Spot Penalty Pts.} + 1/2\ \text{No. of Heavy Hot Spot Penalty Pts.}}{\text{No. of Reg. Conc.} + 1/2\ \text{No. of Heavy Conc.}}$$

3.31 Read the hot spot PPF into Table E and obtain the hot spot correction factor. Subtract the hot spot correction factor from the raw LBI. The result is the LBI.

PARENT AND CHILD LOADING DIVISIONS

3.32 Separate parent and child loading divisions are allowed to exist when there has been a recent addition or when networks are to be removed from a control group. When separately indexed parent and child loading divisions with different concentrator ratios exist, the calculations will be performed as though the networks were combined in a single MCRC loading division.

4. LOAD BALANCE SYSTEM

4.01 The Load Balance System (LBS) is a portion of the Total Network Data System (TNDS). The LBS provides mechanized computation of the LBI as well as assignment and balance guides for offices that do not use a mechanized line assignment system.

4.02 The following paragraphs provide a brief description of the input documents needed to enter a No. 1/1A ESS switch into LBS. Any related Bell Information System Practice (BISP) is also provided.

4.03 In order to use LBS, the No. 1/1A ESS switch must be established in the Common Update (CU) system of TNDS. This process is covered in BISP 756-370-253.

TRAFFIC UNIT RECORD-600 DOCUMENT (756-370-351 BISP)

4.04 This document informs the LBS that the new ESS office exists and is planning to process load balance data through TNDS. The 600 is the base record, and must be input and accepted by CU before any of the other 6XX-series forms can be processed. The 600 document tells LBS the following:

- Who is responsible for the new ESS switch, through area level
- Exactly which office it is by the 11-character Common Language Location Identification (CLLI) code from the TU100, a CU output

- The first scheduled load balance study start date
- Whether LBS will be used to process all the load balance data, or just to report "manually" derived load balance indices.

TRAFFIC UNIT CHARACTERISTICS—601 DOCUMENT (756-370-351 BISP)

4.05 The 601 document is an extension of the 600. It further describes the office which was described in the 600 document. The key information on the input is as follows:

- Total unit (total office) main stations, which must be updated, in some manner, monthly.
- Additional information needed to process manual load balance data, if applicable,
- Reason(s) for not reporting an LBI for a given month.

LOADING DIVISION IDENTIFICATION—620 DOCUMENT (756-370-353 BISP)

4.06 The 620 document identifies each loading division in the office, even if (as is the case with most ESSs) there is only one. For each loading division, the 620 document specifies whether the equipment being studied is as follows:

- Indexed (as are all loading divisions over 30 percent CCS capacity).
- Nonindexed (such as the trunk link grids, currently).
- Child/Fractional: Child meaning either new equipment which has just been added to the office and has 6 months to become loaded to the same level as the old established concentrators or old equipment which is about to be removed. The child loading division is described further in the 625 document.
- Fractional: Refers to fractional LLN, whose concentrators do ***not*** have the same junctor ratio.

LOADING DIVISION CHARACTERISTICS—621 DOCUMENT (756-370-353 BISP)

4.07 The 621 document is an extension of the 620 document, further describing the parent (not child) loading division(s) which were defined in the 620. Its most important inputs are, per loading division,

(a) The division's engineered CCS capacity

(b) The average holding time (AHT) of the average main station during the load balance busy hour. This value must also be updated with each load balance study

(c) The average CCS/main station, and whether that CCS is "average" or "light." This will affect the balance guides generated by LBS.

(d) Assignment guide print options are as follows:

(1) Whether to print a line assignement guide, and, if so, how long to make it.

(2) Whether or not to print a LET, and, if so, how long to make it.

(3) Whether or not a line assignment guide ***(LAG)*** for just the parent (no child) line equipment is desired.

(4) Whether the ***data summary (DS)*** generated should include ***all*** concentrators in each loading division, or just the exceptions — those failing checks. When current load balance results are unacceptable or questionable, the long ***DS*** should be requested.

SPECIAL OFFICE CHARACTERISTICS—605 DOCUMENT (756-370-351 BISP)

4.08 The 605 document differentiates between LLNs which have 2:1 concentrators, and those which have 4:1 concentrators, in those offices (1AE5 or later) which have both. This must be input to index an MCRC unit.

ASSIGNMENT DIVISION RECORD—610 DOCUMENT (756-370-352 BISP)

4.09 The 610 document is used when two or more separate loading divisions are deemed similar enough to be loaded comparably. This document would apply to an office with MCRC. However, it could apply to loading divisions, originally segregated by main distributing frame zoning which are now to be combined and accessed equally for line assigning, regardless of cable pair location.

CHILD LOADING DIVISION RECORD INPUT—625 DOCUMENT (756-370-354 BISP)

4.10 This document defines temporary "child" loading division(s) with "parent" loading divisions which are indexed.

- Any loading division whose current CCS load is under 30 percent of its engineered capacity is not indexed.

4.11 The 625 document denotes whether the child loading division is growth or removal equipment. Child loading divisions are most likely to be growth unless the office is about to undergo an area transfer or a B-link concentration change (BCRC) to decrease its line-to-junctor ratio, and increase the number of B-links per line switch frame/circuit by having existing line switch frame circuits removed.

(a) The TNDS-LBS will automatically include a growth child loading division in the parent loading division after 6 months have passed. In the meantime, the child should be loaded to look as much like the parent loading division as possible. This will minimize the discrepancy in load balance after the two are joined for reporting and assigning purposes.

(b) A removal child may continue on as a separate division indefinitely. It does not have its equipment included on any of its parent's balance guide reports. A removal child may have its own balance guide reports generated, if necessary.

HISTORY CHANGE INPUT—690 DOCUMENT (756-370-355 BISP)

4.12 The 690 document allows selected editing of previously processed load balance data. A past LBI may be recomputed only if the average holding time and/or CCS capacity for any loading division were out-of-date when that index was first computed. Invalid W schedule data must be deleted from the LBS history files before generating official company load balance results for the service observing month.

MANUAL TRAFFIC REPORTING INPUT—691 DOCUMENT (756-370-355 BISP)

4.13 Those ESS switches which are not fully on LBS may input their manually derived LBI on this document, so that all end office indices may be consolidated at the district level.

LBS OUTPUT REPORTS

4.14 A listing of the available LBS output reports is provided as Table F. Detailed information on the content of these reports is contained in BISPs 756-370-321 and 756-370-324.

4.15 Examples of some typical LBS reports are included as Fig. 3 through 8. The reports provided are:

(a) TL720 Traffic Unit Index—Addendum: It is an interim LBI that is produced every week that LBS data is processed.

(b) TL732 Data Summary: This report provides the 3-month load balance history for each concentrator in the office. This report also provides summarized statistics of the latest load balance study and the overall office status.

5. TRUNK LINK NETWORK BALANCE

5.01 The NSA is responsible for scheduling and surveillance of trunk link network (TLN) and trunking data. This data is then provided to personnel in other centers (eg, Circuit Provisioning Center [CPC]) for action. The following paragraphs provide a description of the various trunk link network configurations. A brief description of NSA functions is also provided.

5.02 Full TLNs consist of four trunk junctor switch circuits and a full complement of trunk switch circuits (TSCs). The number of TSCs is dependent on the trunk-to-junctor ratio (TJR). A listing of valid TJRs is provided in Table G.

5.03 It is possible to have a fractional TLN in an office. Only one fractional size TLN is permitted in an office but any number of TLNs in an office can be fractional. Fractional size is determined by the ratio of TSCs installed to the full complement of TSCs for a given concentration ratio. For example, four TSCs out of a possible six TSCs, with a 1.50:1 TJR, equals a 2/3 fractional TLN.

5.04 The load unit in a TLN is the trunk grid which is basically equivalent to a concentrator in a LLN. The switching stages in the TLN are the same as in a LLN.

5.05 The TLN balance and trunk grid balance within the networks can have an impact on

customer service. Incoming matching loss and loss of TLN capacity may both be a result of poor grid balance. To ensure good balance results, the NSA should provide surveillance, data, and coordination.

5.06 The NSA provides basic trunking data by scheduling trunk grid data from the W schedule. The data is processed downstream via TNDS in a manner similar to that used for LLNs. The grid usage printouts are sent to the CPC for review and action if necessary.

5.07 Although the grid usage printouts are sent to the CPC, the NSA should be familiar with the content and meaning of these reports. For No. 1/1A ESS switches, the reports can be sorted numerically or by CCS correction valves (see Fig. 9 and 10). The information contained on the reports is defined as follows:

- % of LD AVG—the percentage that a grids load is of the loading divisions average load
- PROJ CCS—the amount of usage based on the current usage and the usage history of the grid
- RAW CCS CORRECTION—the amount of CCS correction required (plus or minus) to bring a given grid close to the average load of the grids in the loading division
- HIST WEEKS—the number of study weeks in the history file for a particular grid.

5.08 Since the correction figures shown are "raw," some caution should be used when attempts are made to balance the load between grids. The NSA should also use the available NORGEN reports when performing trunk analysis. If imbalance problems do occur, the NSA will notify the CPC, then coordinate any required trunk rearrangement(s) with the SCC and the CPC.

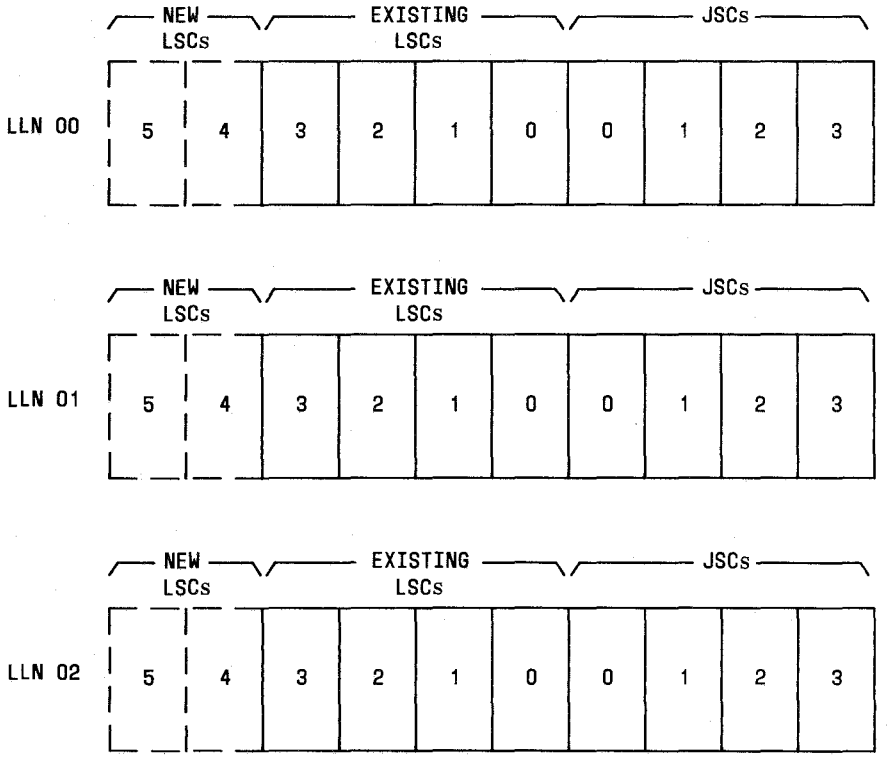
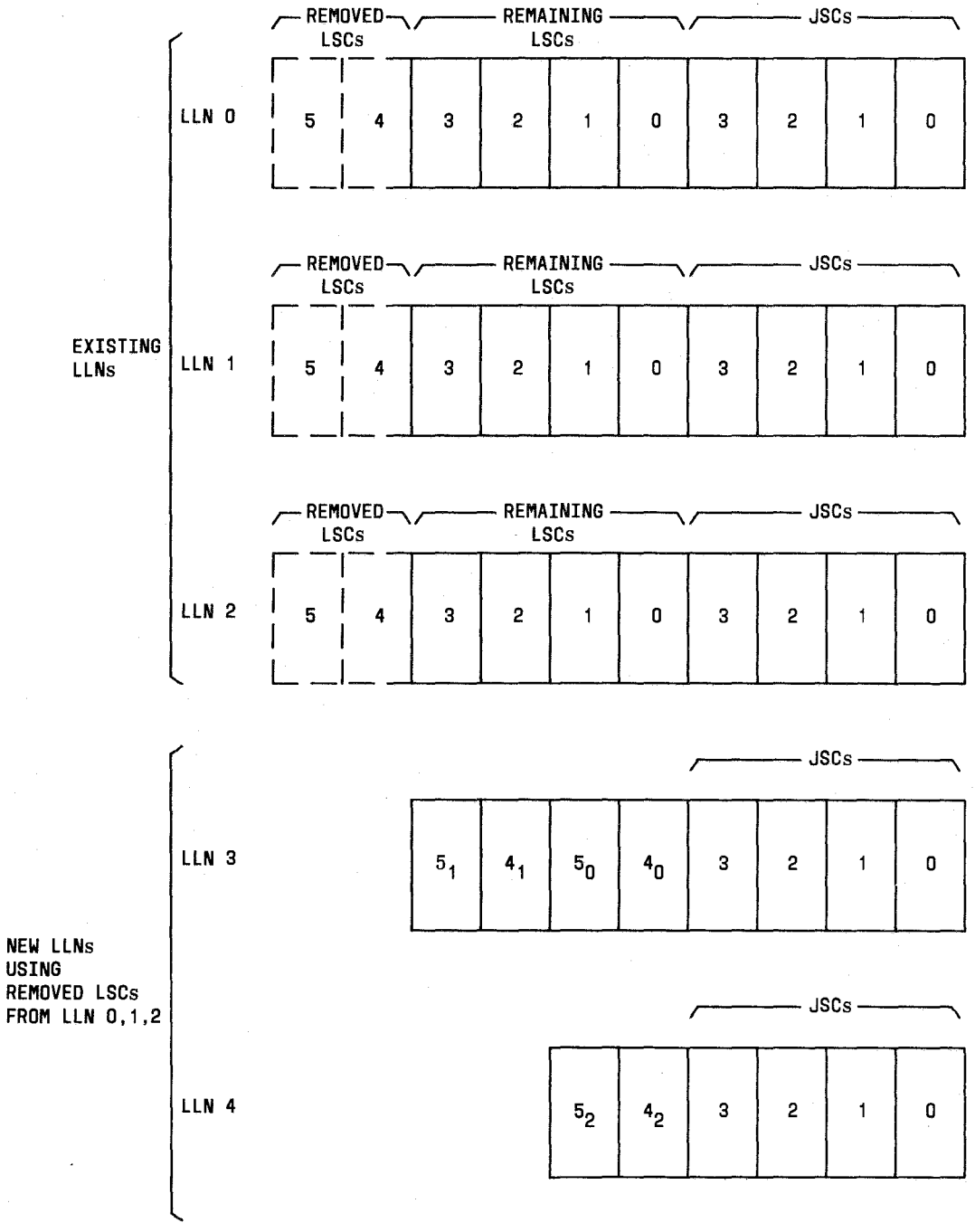


Fig. 1—BCRC 4:1R to 6:1R (2.11)



NOTE: SUBSCRIPTED LSC NUMBERS IN LLN 3 AND 4 INDICATE THE LSC AND LLN WHERE THE LSC WAS PREVIOUSLY LOCATED

Fig. 2—BCRC 6:1R to 4:1R (2.11)

TNDS
LOAD BALANCE
TRAFFIC UNIT INDEX – ADDENDUM

PROCESS DATE 11-23-82
BISP LISTING TL720
RESP CODE

SNAN CGO

OFC TYPE: 1ES SERVICE OBSERVING MO/YR: 11 82 STUDY WEEK DATE: 11 14 82

----LOADING DIVISION---- ID	DESCRIPTION	LATEST VALID STUDY	---INDEX--- RAW LBI	LOAD BAL INDEX	----PERFORMANCE---- BALANCE PENALTY PTS	FRAC	HOT SPOT PENALTY PTS	FRAC	----LOAD UNITS---- QUAN INST	QUAN VALID	% VALID	----LOAD & CAPACITY---- LINE CCS LOAD	ACT CCS LOAD	% CAP	WTD % CAP	SERVICE RESULTS DTS	IML
A1	LLN 00-09 FULL	11 14	100	100	536	.80	0	.00	672	672	100.0	154560	121187	78	78		
TOTALS-			100	100	536	.80	0	.00	672	672	100.0	154560	121187	78	78		

Fig. 3—TL720 Report Single Loading Division (4.15)

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 11-23-82
BISP LISTING TL732
RESP CODE

SNAN CGO OFC TYPE: 1ES

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 LLN 00-09 FULL	11 14 82	1100

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 00									
000	10.0	183	80	+2	+2	+1			
001		199	87	+4	+2	+2	1		
002		219	95	+2	+4	+4	5		5
003		184	80	+2	+4	+1	2		
004		151	66	-4	-4	-2			
005		163	71	+1	+2	02			
006		164	71	-2	-4	-1			
007		177	77	-2	-1	-1			
020		187	81	+4	+2	+1	1		
021		192	83	-2	-4	+1			
022		202	88	+2	+1	+2			
023		198	86	+4	+2	+2	1		
024		176	77	-2	-2	-1			
025		194	84	-1	+1	+1			
026		177	77	-2	-1	-1			
027		189	82	+2	+4	+1	2		
100		202	88	+2	+4	+2	2		
101		234	102	+4	+4	+4	6		3 6
102		147	64	+1	-1	-2			
103		151	66	-1	-2	-2			
104		206	90	+1	+4	+2	2		
105		231	100	-1	-1	+4	3		1 3
106		212	92	+4	+4	+2	3		5
107		212	92	+4	+4	+2	3		5
120		198	86	-1	+1	+2			
121		228	99	+2	+4	+4	5		5
122		190	83	-1	-1	+1			
123		171	74	+2	-1	-1			
124		198	86	+1	+1	+2			
125		181	79	+1	+1	+1			
126		132	57	-4	-1	-4			4
127		237	103	+4	+4	+4	6		3 6

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 00									
200	10.0	162	70	-1	-1	-2			
201		234	102	+4	+2	+4	4		3
202		202	88	+2	+4	+2	2		
203		202	88	+1	-1	+2			
204		193	84	+2	-2	+1			
205		173	75	+4	-1	-1	1		2
206		177	77	-1	-1	-1			
207		186	81	0	-2	+1			
220		229	100	+4	+4	+4	6		3 6
221		200	87	+2	+2	+2			
222		186	81	+1	+1	+1			
223		190	83	+1	+1	+1			
224		227	99	+4	+2	+4	4		
225		226	98	+1	+1	+4	3		
226		252	110	+2	+4	+4	5		3 5
227		244	106	+4	+4	+4	6		3 6
300		177	77	+2	+1	-1			
301		233	101	+2	+4	+4	5		3 5
302		212	92	+1	+4	+2	2		
303		189	82	+2	+1	+1			
304		159	69	-1	-2	-2			
305		220	96	+2	+1	+4	3		
306		181	79	-2	-1	+1			
307		181	79	-2	+1	+1			
320		187	81	-1	+2	+1			
321		176	77	+2	-1	-1			
322		237	103	+4	+4	+4	6		3 6
323		167	73	+1	-1	-1			
324		174	76	-2	-1	-1			
325		183	80	-1	+1	+1			
326		205	89	+1	+2	+2			
327		143	62	-2	+1	-4			4

REMARK CODES

1 ASCENDING TREND	4 CHECK LOW CCS	7 HOT SPOT	* = HOT SPOT
2 DESCENDING TREND	5 SECOND +4	8 FIRST SEQUENT HOT SPOT	
3 CHECK HIGH CCS	6 THIRD +4	9 SECOND SEQUENT HOT SPOT	

PAGE 1

Fig. 4—TL732 Report for Single Loading Division (Sheet 1 of 5) (4.15)

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 11-23-82
BISP LISTING TL732
RESP CODE

SNAN CGO OFC TYPE: 1ES

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 LLN 00-09 FULL	11 14 82	1100

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 09									
000	10.0	189	82	+1	-1	+1			
001		189	82	+1	+2	+1			
002		198	86	+1	-1	+2			
003		198	86	+4	+1	+2	1		
004		163	71	0	+1	-2			
005		195	85	-2	-2	+1			
006		212	92	+1	+4	+2	2		
007		196	85	-2	+1	+1			
020		212	92	-2	+1	+2			
021		171	74	+2	-2	+1			
022		180	78	-1	-1	0			
023		168	73	-2	-2	-1			
024		209	91	+4	+4	+2	3		5
025		173	75	+1	+1	-1			
026		167	73	-1	-1	-1			
027		154	67	-2	+1	-2			
100		172	75	-1	-2	-1			
101		162	70	-1	-2	-2			
102		190	83	+1	+4	+1	2		
103		215	93	-1	+2	+4	3	1	
104		200	87	+4	+4	+2	3		5
105		161	70	+1	+2	-2			
106		178	77	+1	-1	-1			
107		141	61	-4	-2	-4		4	
120		145	63	-2	+1	-4		4	
121		177	77	-1	+1	-1			
122		212	92	+4	-1	+2	1		
123		186	81	+1	+2	+1			
124		153	67	-1	+1	-2			
125		190	83	-1	-1	+1			
126		127	55	-4	-4	-4		4	
127		177	77	+2	-1	-1			

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 09									
200	10.0	217	94	+4	+4	+4	6		6
201		181	79	+1	-1	+1			
202		182	79	+1	+2	+1			
203		163	71	-2	+2	-2			
204		141	61	-2	-2	-4			4
205		202	88	+4	+4	+2	3		5
206		192	83	+1	+2	+1			
207		176	77	+2	-1	-1			
220		202	88	+4	+4	+2	3		5
221		120	52	-4	-1	-4			4
222		191	83	+2	+1	+1			
223		202	88	-1	+4	+2	2		
224		179	78	+1	+1	-1			
225		173	75	-1	+1	-1			
226		125	54	+2	-4	-4			2 4
227		177	77	+1	-1	-1			
300		213	93	+4	+1	+2	1		
301		179	78	-1	+4	-1	2		
302		96	42	+2	+4	-4	2		4
303		91	40	+4	-4	-4	1		2 4
304		195	85	+2	+2	+1			
305		134	58	+2	+1	-4			2 4
306		171	74	-2	-1	-1			
307		163	71	+1	+1	-2			
320		184	80	-1	+2	+1			
321		208	90	+4	+4	+2	3		5
322		196	85	+2	+1	+1			
323		201	87	+4	+2	+2	1		
324		182	79	+1	+1	+1			
325		110	48	-2	-4	-4			4
326		204	89	-1	+4	+2	2		
327		155	67	-2	-4	-2			

REMARK CODES

1 ASCENDING TREND	4 CHECK LOW CCS	7 HOT SPOT	* = HOT SPOT
2 DESCENDING TREND	5 SECOND +4	8 FIRST SEQUENT HOT SPOT	
3 CHECK HIGH CCS	6 THIRD +4	9 SECOND SEQUENT HOT SPOT	

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Fig. 4—TL732 Report for Single Loading Division (Sheet 2 of 5) (4.15)

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 11-23-82
BISP LISTING TL732
RESP CODE

SNAN CGO OFC TYPE: 1ES

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 LLN 00-09 FULL	11 14 82	1100

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS	CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 10																			
000	10.0	86	37	-4	-4	-4			4										
001		148	64	-2	-1	-2													
002		121	53	-1	-4	-4			4										
003		114	50	-4	-4	-4			4										
004		90	39	-4	-4	-4			4										
005		126	55	-4	-4	-4			4										
006		127	55	-4	-4	-4			4										
007		196	85	-4	-2	+1		1											
020		117	51	-1	-4	-4			4										
021		166	72	-1	-2	-1													
022		232	101	-1	+1	+4	3	1	3										
023		86	37	-4	-4	-4			4										
024		125	54	-4	-4	-4			4										
025		69	30	-4	-4	-4			4										
026		138	60	-4	-4	-4			4										
027		117	51	-4	-4	-4			4										
100		195	85	+4	+4	+1	3		5										
101		184	80	+4	+4	+1	3		5										
102		148	64	-4	-4	-2													
103		138	60	-4	-4	-4			4										
104		132	57	-4	-4	-4			4										
105		103	45	-4	-4	-4			4										
106		149	65	-4	-1	-2													
107		124	54	-1	-2	-4			4										
120		132	57	-4	-2	-4			4										
121		198	86	-4	-1	+2		1											
122		162	70	-4	-4	-2													
123		139	60	-4	-4	-4			4										
124		159	69	-4	-1	-2													
125		131	57	-4	-4	-4			4										
126		123	53	-4	-4	-4			4										
127		61	27	-4	-4	-4			4										

REMARK CODES

1 ASCENDING TREND	4 CHECK LOW CCS	7 HOT SPOT	* = HOT SPOT
2 DESCENDING TREND	5 SECOND +4	8 FIRST SEQUENT HOT SPOT	
3 CHECK HIGH CCS	6 THIRD +4	9 SECOND SEQUENT HOT SPOT	

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Fig. 4—TL732 Report for Single Loading Division (Sheet 3 of 5) (4.15)

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 11-23-82
BISP LISTING TL732
RESP CODE

SNAN CGO OFC TYPE: 1ES

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 LLN 00-09 FULL	11 14 82	1100

LOADING DIVISION INDEX CALCULATION

WEIGHTED LOAD DIV % OF CAP	BALANCE PENALTY PTS	BALANCE PENALTY FRAC	HOT SPOT PENALTY PTS	HOT SPOT PENALTY FRAC	% VALID CONC	RAW LBI	HOT SPOT CORR	LBI
78	536	.80	0	.00	100.0	100	0	100

VALUES USED FOR CURRENT WEEK SCORE CALCULATION

AVG HOUR CCS/CONC	LD % CAP	AHT	TOTAL CONC	VALID CONC
180	78	147C (11/14/82)	672	672

LINE SWITCH FRAME STATISTICS

LLN	LSF/LSC	AVG HR CCS	BALANCE PENALTY	HOT SPOT PENALTY	LSF/LSC % CAP	LSF/LSC % OF GRP AVG
0	0	185	12	0	80	103
0	1	196	30	0	85	109
0	2	205	31	0	89	114
0	3	189	16	0	82	105
1	0	179	21	0	78	99
1	1	184	22	0	80	102
1	2	195	19	0	85	108
1	3	180	13	0	78	100
2	0	187	18	0	81	104
2	1	195	21	0	85	108
2	2	190	8	0	82	105
2	3	185	20	0	81	103
3	0	190	24	0	83	106
3	1	182	13	0	79	101
3	2	188	20	0	82	105
3	3	190	22	0	83	105
4	0	169	6	0	74	94
4	1	178	1	0	77	99
4	2	181	15	0	79	100

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Fig. 4—TL732 Report for Single Loading Division (Sheet 4 of 5) (4.15)

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 11-23-82
BISP LISTING TL732
RESP CODE

SNAN CGO OFC TYPE: 1ES

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 LLN 00-09 FULL	11 14 82	1100

LINE SWITCH FRAME STATISTICS

LLN	LSF/LSC	AVG HR CCS	BALANCE PENALTY	HOT SPOT PENALTY	LSF/LSC % CAP	LSF/LSC % OF GRP AVG
4	3	177	6	0	77	98
5	0	178	4	0	77	99
5	1	173	5	0	75	96
5	2	179	6	0	78	100
5	3	176	5	0	77	98
6	0	177	11	0	77	99
6	1	181	15	0	79	100
6	2	188	25	0	82	104
6	3	186	10	0	81	103
7	0	181	6	0	79	100
7	1	182	9	0	79	101
7	2	187	8	0	81	104
7	3	182	9	0	79	101
8	0	177	11	0	77	98
8	1	178	9	0	77	99
8	2	174	3	0	76	97
8	3	175	12	0	76	97
9	0	186	6	0	81	103
9	1	174	9	0	76	97
9	2	176	14	0	77	98
9	3	168	12	0	73	93
10	0	129	3	0	56	71
10	1	142	6	0	62	79

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Fig. 4—TL732 Report for Single Loading Division (Sheet 5 of 5) (4.15)

TNDS
LOAD BALANCE
TRAFFIC UNIT INDEX – ADDENDUM

PROCESS DATE 12-22-82
BISP LISTING TL720
RESP CODE

SLKC UT MA CG1

OFC TYPE: 1ES MCRC SERVICE OBSERVING MO/YR: 12 82 STUDY WEEK DATE: 12 12 82

----LOADING DIVISION----		LATEST	---INDEX---		----PERFORMANCE----				----LOAD UNITS----			----LOAD & CAPACITY----				SERVICE RESULTS	
ID	DESCRIPTION	VALID STUDY	RAW LBI	LOAD BAL INDEX	BALANCE PENALTY PTS	BALANCE PENALTY FRAC	HOT SPOT PENALTY PTS	HOT SPOT PENALTY FRAC	QUAN INST	QUAN VALID	% VALID	LINE CCS LOAD	ACT CCS LOAD	% CAP	WTD % CAP	DTS	IML
A1	2:1 AND 4:1 LLN'S	05 04	94	94	768	62	0	00	1472	1472	100.0	206080	152550	74	74		
TOTALS-			94	94	768	62	0	00	1472	1472	100.0	206080	152550	74	74		

Fig. 5—TL720 Report for MCRC Office (4.15)

METRO

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 12-22-82
BISP LISTING TL732
RESP CODE

SLKC UT MA CGI OFC TYPE: 1ES MCRC

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 2:1 AND 4:1 LLN'S	12 12 82	1230

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 00									
400H	10.0	79	69			-1			
401H		72	63			-1			
402H		64	56			-2			
403H		115	100			+4	6		3 6
404H		71	62			-1			
405H		81	70			-1			
406H		70	61			-2			
407H		83	72			-1			
410H		92	80			+1			
411H		64	56			-2			
412H		73	63			-1			
413H		50	43			-4			4
414H		90	78			+1			
415H		59	51			-2			
416H		53	46			-4			4
417H		66	57			-2			
500H		61	53			-2			
501H		92	80			+1			
502H		93	81			+1			
503H		79	69			-1			
504H		91	79			+1			
505H		85	74			+0			
506H		85	74			+0			
507H		59	51			-2			
510H		96	83			+1			
511H		89	77			+1			
512H		62	54			-2			
513H		74	64			-1			
514H		83	72			-1			
515H		83	72			-1			
516H		77	67			-1			
517H		83	72			-1			

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 00									
600H	10.0	94	82			+1			
601H		105	91			+2			
602H		91	79			+1			
603H		109	95			+2			
604H		85	74			+0			
605H		68	59			-2			
606H		123	107			+4	6		3 6
607H		95	83			+1			
610H		77	67			-1			
611H		95	83			+1			
612H		85	74			+0			
613H		109	95			+2			
614H		96	83			+1			
615H		120	104			+4	6		3 6
616H		67	58			-2			
617H		106	92			+2			
700H		86	75			+1			
701H		102	89			+2			
702H		101	88			+2			
703H		87	76			+1			
704H		83	72			-1			
705H		87	76			+1			
706H		93	81			+1			
707H		118	103			+4	6		3 6
710H		109	95			+2			
711H		84	73			-1			
712H		80	70			-1			
713H		107	93			+2			
714H		51	44			-4			4
715H		112	97			+2			
716H		122	106			+4	6		3 6
717H		117	102			+4	6		3 6

REMARK CODES

1 ASCENDING TREND
2 DESCENDING TREND
3 CHECK HIGH CCS
4 CHECK LOW CCS
5 SECOND +4
6 THIRD +4
7 HOT SPOT
8 FIRST SEQUENT HOT SPOT
9 SECOND SEQUENT HOT SPOT

* = HOT SPOT

PAGE 2

Fig. 6—TL732 Report for MCRC Office (Sheet 1 of 6) (4.15)

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 12-22-82
BISP LISTING TL732
RESP CODE

METRO

SLKC UT MA CG1 OFC TYPE: 1ES MCRC

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 2:1 AND 4:1 LLN'S	12 12 82	1230

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 00									
000H	10.0	75	65			-1			
001H		70	61			-2			
002H		58	50			-2			
003H		75	65			-1			
004H		104	90			+2			
005H		89	77			+1			
LLN 12									
000R	10.0	182	79			+1			
001R		180	78			+1			
002R		229	100			+4	6		3 6
003R		169	73			-1			
004R		232	101			+4	6		3 6
005R		216	94			+4	6		6
006R		158	69			-1			
007R		123	53			-4			4
010R		179	78			+1			
111R		209	91			+2			
112R		176	77			+1			
113R		154	68			-1			
114R		144	63			-2			
115R		133	58			-2			
116R		156	68			-1			
117R		201	87			+2			

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 00									
200H	10.0	89	77			+1			
201H		75	65			-1			
202H		85	74			+0			
203H		87	75			+1			
204H		59	51			-2			
205H		84	73			-1			
LLN 12									
200R		256	111			+4	6		3 6
201R		147	64			-2			
202R		180	78			+1			
203R		148	64			-2			
204R		189	82			+1			
205R		129	56			-4			4
206R		180	78			+1			
207R		216	94			+4	6		6
210R		178	77			+1			
311R		156	68			-1			
312R		144	63			-2			
313R		215	93			+4	6		6
314R		190	83			+1			
315R		208	90			+2			
316R		238	103			+4	6		3 6
317R		217	94			+4	6		6

REMARK CODES

1 ASCENDING TREND
2 DESCENDING TREND
3 CHECK HIGH CCS
4 CHECK LOW CCS
5 SECOND +4
6 THIRD +4
7 HOT SPOT
8 FIRST SEQUENT HOT SPOT
9 SECOND SEQUENT HOT SPOT

* = HOT SPOT

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Fig. 6—TL732 Report for MCRC Office (Sheet 2 of 6) (4.15)

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 12-22-82
BISP LISTING TL732
RESP CODE

METRO

SLKC UT MA CG1 OFC TYPE: 1ES MCRC

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 2:1 AND 4:1 LLN'S	12 12 82	1230

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 13									
000R	10.0	184	80			+1			
001R		178	77			+1			
002R		174	76			+1			
003R		197	86			+2			
004R		228	99			+4	6		6
005R		175	76			+1			
006R		132	57			-2			
007R		113	49			-4			4
010R		185	80			+1			
011R		129	56			-4			4
012R		147	64			-2			
013R		123	53			-4			4
014R		189	82			+1			
015R		142	62			-2			
016R		175	76			+1			
017R		222	97			+4	6		6
100R		155	67			-1			
101R		210	91			+4	6		6
102R		174	76			+1			
103R		164	71			-1			
104R		175	76			+1			
105R		188	82			+1			
106R		143	62			-2			
107R		200	87			+2			
110R		182	79			+1			
111R		168	73			-1			
112R		160	70			-1			
113R		155	67			-1			
114R		194	84			+2			
115R		151	66			-1			
116R		106	46			-4			4
117R		155	67			-1			

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 13									
200R	10.0	168	73			-1			
201R		202	88			+2			
202R		166	72			-1			
203R		151	66			-1			
204R		309	134			+4	6		3 6
205R		221	96			+4	6		6
206R		276	120			+4	6		3 6
207R		254	110			+4	6		3 6
210R		199	87			+2			
211R		189	82			+1			
212R		174	76			+1			
213R		197	86			+2			
214R		189	82			+1			
215R		135	59			-2			
216R		219	95			+4	6		6
217R		177	77			+1			
300R		147	64			-2			
301R		164	71			-1			
302R		135	59			-2			
303R		98	43			-4			4
304R		120	52			-4			4
305R		155	67			-1			
306R		149	65			-2			
307R		143	62			-2			
310R		121	53			-4			4
311R		123	53			-4			4
312R		178	77			+1			
313R		147	64			-2			
314R		199	87			+2			
315R		135	59			-2			
316R		236	103			+4	6		3 6
317R		172	75			+1			

REMARK CODES

1 ASCENDING TREND
2 DESCENDING TREND
3 CHECK HIGH CCS
4 CHECK LOW CCS
5 SECOND +4
6 THIRD +4
7 HOT SPOT
8 FIRST SEQUENT HOT SPOT
9 SECOND SEQUENT HOT SPOT

* = HOT SPOT

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Fig. 6—TL732 Report for MCRC Office (Sheet 3 of 6) (4.15)

METRO

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 12-22-82
BISP LISTING TL732
RESP CODE

SLKC UT MA CGI OFC TYPE: 1ES MCRC

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 2:1 AND 4:1 LLN'S	12 12 82	1230

LOADING DIVISION INDEX CALCULATION

WEIGHTED LOAD DIV % OF CAP	BALANCE PENALTY PTS	BALANCE PENALTY FRAC	HOT SPOT PENALTY PTS	HOT SPOT PENALTY FRAC	% VALID CONC	RAW LIB	HOT SPOT CORR	LBI
74	768	.62	0	.00	100.0	94	0	94

VALUES USED FOR CURRENT WEEK SCORE CALCULATION

AVG HR CCS/CONC HEAVY	AVG HR CCS/CONC REGULAR	LD % CAP	AHT	TOTAL CONC HEAVY	TOTAL CONC REGULAR	VALID CONC HEAVY	VALID CONC REGULAR
85	170	74	200 (DEFAULT)	1152	320	1152	320

LINE SWITCH FRAME STATISTICS

LLN	LSF/LSC	AVG HR CCS	BALANCE PENALTY	HOT SPOT PENALTY	LSF/LSC % CAP	LSF/LSC % OF GRP AVG
0	0	74	0	0	64	87
0	1	75	0	0	66	89
0	2	78	6	0	68	92
0	3	84	0	0	73	99
0	4	74	6	0	64	87
0	5	81	0	0	70	95
0	6	95	12	0	83	112
0	7	96	18	0	84	113
1	0	88	18	0	76	103
1	1	85	0	0	74	100
1	2	82	0	0	72	97
1	3	83	6	0	72	97
1	4	78	0	0	68	92
1	5	82	0	0	71	97
1	6	91	12	0	79	107
1	7	85	12	0	74	100
2	0	77	0	0	67	90
2	1	78	0	0	68	92
2	2	80	0	0	69	94

Fig. 6—TL732 Report for MCRC Office (Sheet 4 of 6) (4.15)

METRO

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 12-22-82
BISP LISTING TL732
RESP CODE

SLKC UT MA CG1 OFC TYPE: 1ES MCRC

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 2:1 AND 4:1 LLN'S	12 12 82	1230

LINE SWITCH FRAME STATISTICS

LLN	LSF/LSC	AVG HR CCS	BALANCE PENALTY	HOT SPOT PENALTY	LSF/LSC % CAP	LSF/LSC % OF GRP AVG
2	3	75	6	0	65	88
2	4	91	6	0	79	106
2	5	81	6	0	71	96
2	6	102	30	0	89	120
2	7	88	12	0	77	104
3	0	86	0	0	75	102
3	1	77	0	0	67	91
3	2	71	0	0	62	84
3	3	68	0	0	59	79
3	4	80	0	0	69	94
3	5	72	0	0	63	85
3	6	96	24	0	84	113
3	7	100	18	0	87	118
4	0	76	6	0	66	89
4	1	78	0	0	68	92
4	2	73	0	0	63	86
4	3	84	0	0	73	99
4	4	77	0	0	67	91
4	5	69	0	0	60	81
4	6	89	18	0	77	105
4	7	91	18	0	79	107
5	0	70	0	0	60	82
5	1	71	0	0	62	84
5	2	70	0	0	61	82
5	3	77	0	0	67	91
5	4	71	6	0	62	84
5	5	77	0	0	67	91
5	6	86	6	0	74	101
5	7	84	12	0	73	99
6	0	79	0	0	68	93
6	1	77	0	0	67	91
6	2	76	0	0	66	89
6	3	69	0	0	60	81
6	4	74	0	0	65	88
6	5	67	0	0	58	79
6	6	91	18	0	79	108
6	7	101	24	0	88	119
7	0	77	0	0	67	91
7	1	74	0	0	64	87

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Fig. 6—TL732 Report for MCRC Office (Sheet 5 of 6) (4.15)

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 12-22-82
BISP LISTING TL732
RESP CODE

METRO

SLKC UT MA CG1 OFC TYPE: 1ES MCRC

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 2:1 AND 4:1 LLN'S	12 12 82	1230

LINE SWITCH FRAME STATISTICS

LLN	LSF/LSC	AVG HR CCS	BALANCE PENALTY	HOT SPOT PENALTY	LSF/LSC % CAP	LSF/LSC % OF GRP AVG
7	2	71	0	0	62	84
7	3	87	6	0	76	102
7	4	84	0	0	73	99
7	5	83	0	0	72	98
7	6	94	24	0	82	111
7	7	96	6	0	83	113
8	0	83	6	0	73	98
8	1	82	0	0	72	97
8	2	81	12	0	70	95
8	3	83	0	0	72	97
8	4	83	6	0	72	97
8	5	83	12	0	73	98
8	6	94	18	0	82	111
8	7	96	30	0	84	113
9	0	173	6	0	75	102
9	1	180	6	0	78	106
9	2	182	12	0	79	107
9	3	198	36	0	86	116
10	0	189	12	0	82	111
10	1	183	18	0	80	108
10	2	199	18	0	87	117
10	3	185	18	0	80	109
11	0	193	24	0	84	113
11	1	199	36	0	87	117
11	2	189	30	0	82	111
11	3	160	0	0	70	94
12	0	184	24	0	80	108
12	1	185	18	0	80	109
12	2	179	12	0	78	105
12	3	185	24	0	80	109
13	0	168	12	0	73	99
13	1	168	6	0	73	99
13	2	202	30	0	88	119
13	3	151	6	0	66	89

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Fig. 6—TL732 Report for MCRC Office (Sheet 6 of 6) (4.15)

TNDS
LOAD BALANCE
TRAFFIC UNIT INDEX – ADDENDUM

PROCESS DATE 12-22-82
BISP LISTING TL720
RESP CODE

DLLS CGO

OFC TYPE: 1ES SERVICE OBSERVING MO/YR: 12 82 STUDY WEEK DATE: 12 12 82

----LOADING DIVISION---- ID	DESCRIPTION	LATEST VALID STUDY	---INDEX--- RAW LBI	LOAD BAL INDEX	----PERFORMANCE---- BALANCE PENALTY PTS	FRAC	HOT SPOT PENALTY PTS	FRAC	----LOAD UNITS---- QUAN INST	QUAN VALID	% VALID	----LOAD & CAPACITY---- LINE CCS LOAD	ACT CCS LOAD	% CAP	WTD % CAP	SERVICE RESULTS DTS	IML
A1	INDEX LOAD DIV	12 12	95	93	358	1.02	20	.06	352	352	100.0	80960	76071	94	94		
A2	GROWTH	12 12	99	99	103	1.61	0	.00	64	64	100.0	14720	8544	58	52		
TOTALS-			96	94	461	1.11	20	.05	416	416	100.0	95680	84615	88	87		

Fig. 7—TL720 Report for Parent, Child Loading Division (4.15)

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 12-22-82
BISP LISTING TL732
RESP CODE

DLLS CGO OFC TYPE: 1ES

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 INDEX LOAD DIV	12 12 82	1130

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS	CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 00										LLN 00									
000	8.0	240	104	+2	+2	+2			3	200	8.0	285	124	+4	+4	+4	6		3 6
001		224	97	+2	+4	+1	2			201		184	80	-1	-1	-2			
002		199	87	-1	-1	-1				202		193	84	-1	-2	-2			
003		198	86	-1	+2	-1				203		256	111	+4	+4	+4	6		3 6
004		300	130	+4	+4	+4	6		3 6	204		199	87	-1	+1	-1			
005		207	90	+2	-2	-1				205		182	79	-1	-2	-2			
006		181	79	-1	-4	-2				206		212	92	-2	-2	-1			
007		250	109	+2	+4	+2	2		3	207		292	127	+2	+4	+4	5		3 5
020		244	106	+2	+2	+2			3	220		192	83	-4	-1	-2			
021		248	108	+1	+1	+2			3	221		192	83	-1	-1	-2			
022		290	126	+4*	+4*	+4	6	4	3 8	222		197	86	-1	-1	-2			
023		141	61	-4	-4	-4			4	223		194	84	-2	-4	-2			
024		229	100	+1	-1	+1			3	224		230	100	+1	+2	+1			3
025		258	112	+4	+4	+4	6		3 6	225		235	102	-2	-1	+2			3
026		197	86	-4	-4	-2				226		194	84	+1	-1	-2			
027		195	85	+1	-1	-2				227		219	95	-1	-2	+1			
100		175	76	-1	-2	-4			4	300		272	118	+4	+4	+4	6		3 6
101		157	68	-4	-4	-4			4	301		251	109	-1	+1	+2			3
102		220	96	0	+1	+1				302		243	106	+2	+1	+2			3
103		221	96	-1	+1	+1				303		200	87	-4	-2	-1			
104		180	78	+1	+1	-2				304		246	107	+4	+2	+2	1		3
105		259	113	+1	+2	+4	3		3	305		244	106	+4	+2	+2	1		3
106		205	89	-4	-2	-1				306		214	93	+1	+4	-1	2		
107		239	104	-1	-2	+2			3	307		224	97	+1	-1	+1			
120		215	93	-2	-1	-1				320		233	101	+4	+4	+1	3		3 5
121		247	107	+2	+2	+2			3	321		255	111	+4	+1	+4	4		3
122		222	97	+2	+1	+1				322		128	56	-4	+4	-4			4
123		193	84	-1	-2	-2				323		181	79	-1	-2	-2			
124		255	111	-1	+2	+4	3	1	3	324		176	77	-1	-1	-4			4
125		256	111	+4	+2	+4	4		3	325		209	91	+1	+1	-1			
126		105	80	-2	+1	-2				326		222	97	+2	+1	+1			
127		211	92	+4	-1	-1	1	2		327		226	98	-1	+1	+1			

REMARK CODES

1 ASCENDING TREND
2 DESCENDING TREND
3 CHECK HIGH CCS
4 CHECK LOW CCS
5 SECOND +4
6 THIRD +4
7 HOT SPOT
8 FIRST SEQUENT HOT SPOT
9 SECOND SEQUENT HOT SPOT

* = HOT SPOT

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Fig. 8—TL732 Report for Parent, Child Loading Division (Sheet 1 of 4) (4.15)

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 12-22-82
BISP LISTING TL732
RESP CODE

DLLS CGO OFC TYPE: 1ES

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 INDEX LOAD DIV	12 12 82	1130

CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS	CONC	TRUE HR	AVG HR CCS	% ENG CAP	STUDY 3	MONTH 2	SCORE 1	PENALTY POINTS- BAL	HS	REMARKS
LLN 05																			
000	8.0	189	82	-4	-4	-2													
001		163	71	-2	-4	-4			4										
002		263	114	+4	+4	+4	6		3 6										
003		164	71	-2	-2	-4			4										
004		177	77	+2	+1	-4			2 4										
005		199	87	+1	-1	-1													
006		179	78	-4	-4	-2													
007		225	98	-1	+1	+1													
020		142	62	-4	-2	-4			4										
021		111	48	-4	-4	-4			4										
022		171	74	+1	-2	-4			2 4										
023		244	106	+4	+4	+2	3		3 5										
024		223	97	+2	+2	+1													
025		197	86	-2	-2	-2													
026		193	84	-2	-1	-2													
027		135	59	-4	-2	-4			4										
100		182	79	-4	-2	-2													
101		188	82	-2	-1	-2													
102		248	108	-1	-1	+2			3										
103		148	64	-4	-2	-4			4										
104		189	82	-2	-4	-2													
105		192	83	-4	-4	-2													
106		172	75	-4	-4	-4			4										
107		188	82	-2	-4	-2													
120		118	51	-4	-4	-4			4										
121		180	78	-1	+4	-2	2												
122		244	106	+4	+2	+2	1		3										
123		210	91	+1	-1	-1													
124		153	69	-4	+1	-4			4										
125		121	53	-4	-4	-4			4										
126		195	85	-1	-1	-2													
127		245	107	+4	+4	+2	3		3 5										

REMARK CODES

1 ASCENDING TREND
2 DESCENDING TREND
3 CHECK HIGH CCS
4 CHECK LOW CCS
5 SECOND +4
6 THIRD +4
7 HOT SPOT
8 FIRST SEQUENT HOT SPOT
9 SECOND SEQUENT HOT SPOT

* = HOT SPOT

Fig. 8—TL732 Report for Parent, Child Loading Division (Sheet 2 of 4) (4.15)

DLLS CGO OFC TYPE: 1ES

LOADING DIVISION	STUDY WK DATE	END HOUR
A1 INDEX LOAD DIV	12 12 82	1130

LOADING DIVISION INDEX CALCULATION

WEIGHTED LOAD DIV % OF CAP	BALANCE PENALTY PTS FRAC	HOT SPOT PENALTY PTS FRAC	% VALID CONC	RAW LBI	HOT SPOT CORR	LBI
94	358 1.02	20 .06	100.0	95	-2	93

VALUES USED FOR CURRENT WEEK SCORE CALCULATION

AVG HOUR CCS/CONC	LD % CAP	AHT	TOTAL CONC	VALID CONC
216	94	149H (11/14/82)	352	352

LINE SWITCH FRAME STATISTICS

LLN	LSF/LSC	AVG HR CCS	BALANCE PENALTY	HOT SPOT PENALTY	LSF/LSC % CAP	LSF/LSC % OF GRP AVG
0	0	225	22	4	98	104
0	1	215	11	0	93	100
0	2	216	17	0	94	100
0	3	220	17	0	96	102
1	0	221	22	0	96	103
1	1	218	8	0	95	101
1	2	219	14	4	95	101
1	3	216	11	0	94	100
2	0	239	39	0	104	111
2	1	230	22	0	100	106
2	2	219	19	0	95	102
2	3	230	18	0	100	106
3	0	216	18	0	94	100
3	1	223	10	3	97	103
3	2	241	19	2	105	112
3	3	219	19	0	95	101
4	0	233	30	6	101	108
4	1	190	2	0	78	84
4	2	207	14	1	90	96

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Fig. 8—TL732 Report for Parent, Child Loading Division (Sheet 3 of 4) (4.15)

TNDS
LOAD BALANCE
INDEX STUDY--DATA SUMMARY

PROCESS DATE 12-22-82
BISP LISTING TL732
RESP CODE

DLLS CGO OFC TYPE: 1ES

	LOADING DIVISION	STUDY WK DATE	END HOUR
A1	INDEX LOAD DIV	12 12 82	1130

LINE SWITCH FRAME STATISTICS

LLN	LSF/LSC	AVG HR CCS	BALANCE PENALTY	HOT SPOT PENALTY	LSF/LSC % CAP	LSF/LSC % OF GRP AVG
4	3	193	11	0	84	89
5	0	186	9	0	81	86
5	1	186	6	0	81	86

Fig. 8—TL732 Report for Parent, Child Loading Division (Sheet 4 of 4) (4.15)

TNDS
LOAD BALANCE
SELECTED REPORT
TRUNK LINK NETWORK

PROCESS DATE 07-06-83
BISP LISTING TL766
RESP CODE EBW3

07 CGO

----LOADING DIVISION----

ID	DESCRIPTION	OFC TYPE	STUDY WK DATE	END HOUR
CC	16-TLN	1ES	07 30 78	1715

TLN	GRID	# OF LD AVG	PROJ CCS	RAW CCS CORRECTION	HIST WEEKS	TLN	GRID	# OF LD AVG	PROJ CCS	RAW CCS CORRECTION	HIST WEEKS
05	00	125	81	- 10	9	06	00	56	38	33	9
	01	82	53	16	9		01	65	42	29	9
	02	91	59	12	9		02	86	56	15	9
	03	97	63	8	9		03	122	79	- 8	9
	10	102	66	5	9		10	108	70	1	9
	11	88	57	14	9		11	94	61	10	9
	12	91	59	12	9		12	68	44	27	9
	13	109	71	0	9		13	125	81	- 10	9
	20	75	49	22	9		20	95	62	9	9
	21	62	40	31	9		21	105	68	3	9
	22	62	53	18	9		22	115	75	- 4	9
	23	128	83	- 12	9		23	82	53	18	9
	30	134	87	- 16	9		30	102	66	5	9
	31	103	67	4	9		31	86	56	15	9
	32	100	65	6	9		32	129	84	- 13	9
	33	86	56	15	9		33	98	64	7	9
	40	78	51	20	9		40	125	81	- 10	9
	41	111	72	- 1	9		41	95	62	9	9
	42	91	59	12	9		42	102	66	5	9
	43	86	56	15	9		43	66	43	28	9
	50	66	43	28	9		50	120	78	- 7	9
	51	112	73	- 2	9		51	78	51	20	9
	52	134	87	- 16	9		52	123	80	- 9	9
	53	138	90	- 19	9		53	126	82	- 11	9
	60	100	65	6	9		60	94	61	10	9
	61	83	54	17	9		61	86	56	15	9
	62	108	70	1	9		62	114	74	- 3	9
	63	91	59	12	9		63	125	81	- 10	9
	70	143	93	- 22	9		70	125	81	- 10	9
	71	106	69	2	9		71	129	84	- 13	9
	72	72	47	24	9		72	89	58	13	9
	73	88	57	14	9		73	118	77	- 6	9
NET		110	2054			NET		113	2114		

AVG CCS/GRID: 65 AVG CCS/TLN: 1867

Fig. 9—TL766 Report

TNDS
LOAD BALANCE
SELECTED REPORT
TRUNK LINK NETWORK

PROCESS DATE 07-06-83
BISP LISTING TL767
RESP CODE EBW3

07 CGO

----LOADING DIVISION----

ID	DESCRIPTION	OFC TYPE	STUDY WK DATE	END HOUR
CC	16-TLN	1ES	07 30 78	1715

TLN	GRID	# OF LD AVG	PROJ CCS	RAW CCS CORRECTION	HIST WEEKS	TLN	GRID	# OF LD AVG	PROJ CCS	RAW CCS CORRECTION	HIST WEEKS
05	21	62	40	31	9	06	00	58	38	33	9
	50	66	43	28	9		01	65	42	29	9
	20	75	49	22	9		43	66	43	28	9
	40	78	51	20	9		12	68	44	27	9
	01	82	53	18	9		51	78	51	20	9
	22	82	53	18	9		23	82	53	18	9
	61	83	54	17	9		02	86	56	15	9
	33	86	56	15	9		31	86	56	15	9
	43	86	56	15	9		61	86	56	15	9
	11	88	57	14	9		72	89	58	13	9
	73	88	57	14	9		11	94	61	10	9
	02	91	59	12	9		60	94	61	10	9
	12	91	59	12	9		20	95	62	9	9
	42	91	59	12	9		41	95	62	9	9
	63	91	59	12	9		33	98	64	7	9
	03	97	63	8	9		30	102	66	5	9
	32	100	65	6	9		42	102	66	5	9
	60	100	65	6	9		21	105	68	3	9
	10	102	66	5	9		10	108	70	1	9
	31	103	67	4	9		62	114	74	-3	9
	71	106	69	2	9		22	115	75	-4	9
	62	108	70	1	9		73	118	77	-6	9
	13	109	71	0	9		50	120	78	-7	9
	41	111	72	-1	9		03	122	79	-8	9
	51	112	73	-2	9		52	123	80	-9	9
	00	125	81	-10	9		13	125	81	-10	9
	23	128	83	-12	9		40	125	81	-10	9
	30	134	87	-16	9		63	125	81	-10	9
	52	134	87	-16	9		70	125	81	-10	9
	53	138	90	-19	9		32	129	84	-13	9
	70	143	93	-22	9		71	129	84	-13	9
NET		110	2054			NET		113	2114		

AVG CCS/GRID: 6 AVG CCS/TLN: 1867

Fig. 10—TL767 Report

TABLE A

LLN CONFIGURATION AND CAPACITIES

CONC. RATIO (LJR)	A T &T RATING (Note 1)	NETWORK SIZES	LINE SWITCH FRAMES REQD.' PER LLN	JUNCTOR SW. FRAMES REQD.' PER LLN	LINE TERMS. AVAILABLE PER LLN	CCS CAPACITY PER LINE SWITCH FRAME	CCS CAPACITY PER FULL LLN (Note 2)	CCS CAPACITY PER TERMINAL (Note 3)
2:1 H	A & M	1/4 1/2 3/4 Full	1 HOME 1 HOME 1 MATE 2 HOME 1 MATE 2 HOME 2 MATE	4	512 1024 1536 2048	3800	15220	7.42
2.5:1 H	A & M	1/5 2/5 3/5 4/5 Full	1 HOME 1 HOME 1 MATE 2 HOME 1 MATE 2 HOME 2 MATE 3 HOME 2 MATE	4	512 1024 1536 2048 2560	3120	15600	6.09
3:1 H	A & M	1/6 1/3 1/2 2/3 5/6 Full	1 HOME 1 HOME 1 MATE 2 HOME 1 MATE 2 HOME 2 MATE 3 HOME 2 MATE 3 HOME 3 MATE	4	512 1024 1536 2048 2560 3072	2660	15960	5.20
3.5:1 H	A & M	1/7 2/7 3/7 4/7 5/7 6/7 Full	1 HOME 1 HOME 1 MATE 2 HOME 1 MATE 2 HOME 2 MATE 3 HOME 2 MATE 3 HOME 3 MATE 4 HOME 3 MATE	4	512 1024 1536 2048 2560 3072 3584	2340	16380	4.57
4:1 H	A & M	1/8 1/4 3/8 1/2 5/8 3/4 7/8 Full	1 HOME 1 HOME 1 MATE 2 HOME 1 MATE 2 HOME 2 MATE 3 HOME 2 MATE 3 HOME 3 MATE 4 HOME 3 MATE 4 HOME 4 MATE	4	512 1024 1536 2048 2560 3072 3584 4096	2100	16800	4:11

Note 1: All ferreed LJR s are rated A&M or MD since ferreed LLN equipment is rated A&M

Note 2: CCS capacity of fractional network = size of fractional network X CCS capacity per full LLN

Note 3: CCS per line terminal reflects the CCS per installed line termination. It can be used as follows:

(a) CCS per line terminal ÷ actual line fill = maximum CCS per working line.

(b) CCS per line terminal ÷ CCS per working line = maximum line fill.

TABLE A (Contd)

LLN CONFIGURATION AND CAPACITIES

CONC. RATIO (LJR)	A T &T RATING (Note 1)	NETWORK SIZES	LINE SWITCH FRAMES REQD.' PER LLN (3-BAY COMBINATION)	JUNCTOR SW. FRAMES REQD.' PER LLN	LINE TERMS. AVAILABLE PER LLN	CCS CAPACITY PER LINE SWITCH FRAME	CCS CAPACITY PER FULL LLN (Note 2)	CCS CAPACITY PER TERMINAL (Note 3)
4:1 R	A & M	1/4 1/2 3/4 Full	1 2 3 4	4	1024 2048 3072 4096	3680	14720	3.59
5:1 R	A & M	1/5 2/5 3/5 4/5 Full	1 2 3 4 5	4	1024 2048 3072 4096 5120	3020	15100	2.95
6:1 R	A & M	1/6 1/3 1/2 2/3 5/6 Full	1 2 3 4 5 6	4	1024 2048 3072 4096 5120 6144	2580	15480	2.52
7:1 R	MD	1/7 2/7 3/7 4/7 5/7 6/7 Full	1 2 3 4 5 6 7	4	1024 2048 3072 4096 5120 6144 7168	2260	15820	2.21
8:1 R	MD	1/8 1/4 3/8 1/2 5/8 3/4 7/8 Full	1 2 3 4 5 6 7 8	4	1024 2048 3072 4096 5120 6144 7168 8192	2040	16320	1.99

Note 1: All ferreed LJR s are rated A&M or MD since ferreed LLN equipment is rated A&M

Note 2: CCS capacity of fractional network = size of fractional network × CCS capacity per full LLN

Note 3: CCS per line terminal reflects the CCS per installed line termination. It can be used as follows:

(a) CCS per line terminal ÷ actual line fill = maximum CCS per working line.

(b) CCS per line terminal ÷ CCS per working line = maximum line fill.

TABLE A (Contd)

LLN CONFIGURATION AND CAPACITIES

CONC. RATIO (LJR)	AT&T RATING	NETWORK SIZES	LINE SWITCH CKTS. REQD PER LLN	JUNCTOR SW. CKTS. REQD PER LLN	LINE TERMS. AVAILABLE PER LLN	CCS CAPACITY PER LINE SWITCH CKT	CCS CAPACITY PER FULL LLN (Note 1)	CCS CAPACITY PER TERMINAL (Note 2)
2 : 1 H	Std.	1/2 Full	2 4	4	1024 2048	3800	15220	7.42
3 : 1 H	Std.	1/3 2/3 Full	2 4 6	4	1024 2048 3072	2660	15960	5.20
4 : 1 R	Std.	1/2 Full	2 4	4	2048 4096	3680	14720	3.59
6 : 1 R	Std.	1/3 2/3 Full	2 4 6	4	2048 4096 6144	2580	15480	2.52

Note 1: CCS capacity of fractional network = size of fractional network × CCS capacity per full LLN

Note 2: CCS per line terminal reflects the CCS per installed line termination. It can be used as follows:

(a) CCS per line terminal ÷ actual line fill = maximum CCS per working line.
(b) CCS per line terminal ÷ CCS per working line = maximum line fill.

TABLE B

LOAD BALANCE QUALITY CONTROL LIMITS BASED ON 10-HOUR DATA

(MARCH 1975)

LOAD BALANCE QUALITY CONTROL LIMITS
BASED ON 10 HOUR DATA

NO. 1 ESS (2:1 & 4:1 CONCS.)

AVERAGE HOLDING TIME (SECS)	ACTUAL AVERAGE LOAD PERCENTAGE OF ENGINEERING LOAD																			
	30% TO 35%					36% TO 45%					46% TO 55%					56% TO 65%				
	LINE JUNCTOR RATIO					LINE JUNCTOR RATIO					LINE JUNCTOR RATIO					LINE JUNCTOR RATIO				
	2:1 & 4:1	2.5:1 & 5:1	3:1 & 6:1	3.5:1 & 7:1	4:1 & 8:1	2:1 & 4:1	2.5:1 & 5:1	3:1 & 6:1	3.5:1 & 7:1	4:1 & 8:1	2:1 & 4:1	2.5:1 & 5:1	3:1 & 6:1	3.5:1 & 7:1	4:1 & 8:1	2:1 & 4:1	2.5:1 & 5:1	3:1 & 6:1	3.5:1 & 7:1	4:1 & 8:1
0 – 70	19	21	23	25	26	17	19	20	21	23	15	17	18	19	20	14	15	16	17	18
71 – 90	22	25	27	28	30	19	21	23	25	26	17	19	21	22	23	16	17	19	20	21
91 – 110	25	28	30	32	33	22	24	26	28	29	19	21	23	25	26	18	20	21	23	24
111 – 130	27	30	33	35	37	24	26	28	30	32	21	23	25	27	28	19	21	23	25	26
131 – 150	29	33	35	38	40	26	28	31	33	34	23	25	27	29	31	21	23	25	27	28
151 – 170	31	35	38	40	42	27	30	33	35	37	24	27	29	31	33	22	25	27	29	30
171 – 190	33	37	40	43	45	29	32	35	37	39	26	29	31	33	35	24	26	28	30	32
191 – 210	35	39	42	45	47	31	34	36	39	41	27	30	33	35	37	25	28	30	32	34
211 – 230	37	41	44	47	50	32	35	38	41	43	29	32	34	37	38	26	29	31	33	35
231 – 250	39	43	46	49	52	33	37	40	43	45	30	33	36	38	40	27	30	33	35	37
251 – 270	40	44	48	51	54	35	38	42	44	47	31	34	37	40	42	28	31	34	36	38
271 – 290	42	46	50	53	56	36	40	43	46	48	32	36	39	41	43	30	33	35	38	40
291 – 310	43	48	51	55	58	37	41	45	48	50	33	37	40	43	45	31	34	37	39	41
311 – 330	45	49	53	57	60	39	43	46	49	52	35	38	41	44	46	32	35	38	40	42
331 – 350	46	51	55	58	62	40	44	48	51	53	36	39	43	45	48	33	36	39	42	44
351 – 370	47	52	56	60	63	41	45	49	52	55	37	40	44	47	49	34	37	40	43	45
371 – 390	48	54	58	62	65	42	46	50	53	56	38	42	45	48	51	34	38	41	44	46
391 – 410	50	55	59	63	67	43	48	52	55	58	39	43	46	49	52	35	39	42	45	47
411 – 430	51	56	61	65	68	44	49	53	56	59	40	44	47	50	53	36	40	43	46	49
431 – 450	52	58	62	67	70	45	50	54	58	61	41	45	48	52	54	37	41	44	47	50
451 – 470	53	59	64	68	72	46	51	55	59	62	41	46	50	53	56	38	42	45	48	51
471 – 490	54	60	65	69	73	47	52	56	60	63	42	47	51	54	57	39	43	46	49	52

TABLE B (Contd)

LOAD BALANCE QUALITY CONTROL LIMITS BASED ON 10-HOUR DATA

(MARCH 1975)

LOAD BALANCE QUALITY CONTROL LIMITS
BASED ON 10 HOUR DATA

NO. 1 ESS (2:1 & 4:1 CONCS.)

AVERAGE HOLDING TIME (SECS)	ACTUAL AVERAGE LOAD PERCENTAGE OF ENGINEERING LOAD																			
	66% TO 75%					76% TO 85%					86% TO 95%					96% AND UP				
	LINE JUNCTOR RATIO					LINE JUNCTOR RATIO					LINE JUNCTOR RATIO					LINE JUNCTOR RATIO				
	2:1 & 4:1	2.5:1 & 5:1	3:1 & 6:1	3.5:1 & 7:1	4:1 & 8:1	2:1 & 4:1	2.5:1 & 5:1	3:1 & 6:1	3.5:1 & 7:1	4:1 & 8:1	2:1 & 4:1	2.5:1 & 5:1	3:1 & 6:1	3.5:1 & 7:1	4:1 & 8:1	2:1 & 4:1	2.5:1 & 5:1	3:1 & 6:1	3.5:1 & 7:1	4:1 & 8:1
0 – 70	13	14	15	16	17	12	13	14	15	16	11	12	13	14	15	11	12	13	14	14
71 – 90	15	16	18	19	20	14	15	16	17	18	13	14	15	17	17	12	14	15	16	16
91 – 110	16	18	20	21	22	15	17	18	20	21	14	16	17	18	19	14	15	16	17	18
111 – 130	18	20	21	23	24	17	19	20	21	23	16	17	19	20	21	15	17	18	19	20
131 – 150	19	21	23	25	26	18	20	22	23	24	17	19	20	22	23	16	18	19	21	22
151 – 170	21	23	25	26	28	19	21	23	25	26	18	20	22	23	25	17	19	21	22	23
171 – 190	22	24	26	28	29	21	23	25	26	28	19	21	23	25	26	18	20	22	23	25
191 – 210	23	26	28	30	31	22	24	26	28	29	20	23	24	26	27	19	21	23	25	26
211 – 230	24	27	29	31	33	23	25	27	29	30	21	24	26	27	29	20	22	24	26	27
231 – 250	25	28	30	32	34	24	26	28	30	32	22	25	27	29	30	21	23	25	27	28
251 – 270	26	29	32	34	35	25	27	29	31	33	23	26	28	30	31	22	24	26	28	30
271 – 290	27	30	33	35	37	26	28	31	33	34	24	27	29	31	32	23	25	27	29	31
291 – 310	28	31	34	36	38	27	29	32	34	36	25	28	30	32	34	24	26	28	30	32
311 – 330	29	32	35	37	39	27	30	33	35	37	26	29	31	33	35	25	27	29	31	33
331 – 350	30	33	36	38	40	28	31	34	36	38	27	29	32	34	36	25	28	30	32	34
351 – 370	31	34	37	40	42	29	32	35	37	39	27	30	33	35	37	26	29	31	33	35
371 – 390	32	35	38	41	43	30	33	36	38	40	28	31	34	36	38	27	29	32	34	36
391 – 410	33	36	39	42	44	31	34	37	39	41	29	32	34	37	39	27	30	33	35	37
411 – 430	34	37	40	43	45	31	35	37	40	42	30	33	35	38	40	28	31	34	36	38
431 – 450	34	38	41	44	46	32	35	38	41	43	30	33	36	39	41	29	32	34	37	39
451 – 470	35	39	42	45	47	33	36	39	42	44	31	34	37	39	42	29	32	35	37	39
471 – 490	36	40	43	46	48	34	37	40	43	45	32	35	38	40	42	30	33	36	38	40

TABLE C

"ESS" SWITCH RAW LOAD BALANCE INDEX TABLE

PPF	PERCENTAGE OF CAPACITY							
	96-100	91-95	86-90	81-85	71-80	61-70	51-60	30-50
0.00 — 0.20	100	100	100	100	100	100	100	100
0.21 — 0.30	99	100	100	100	100	100	100	100
0.31 — 0.40	99	100	100	100	100	100	100	100
0.41 — 0.50	98	99	100	100	100	100	100	100
0.51 — 0.60	97	99	100	100	100	100	100	100
0.61 — 0.70	97	98	99	100	100	100	100	100
0.71 — 0.80	96	98	99	100	100	100	100	100
0.81 — 0.90	95	97	98	99	100	100	100	100
0.91 — 1.00	94	96	98	99	100	100	100	100
1.01 — 1.10	93	95	97	98	99	100	100	100
1.11 — 1.20	92	94	96	98	99	100	100	100
1.21 — 1.30	91	93	96	97	98	100	100	100
1.31 — 1.40	90	92	95	96	98	99	100	100
1.41 — 1.50	88	91	94	95	98	99	100	100
1.51 — 1.60	86	90	93	94	96	98	100	100
1.61 — 1.70	84	88	91	93	95	98	99	100
1.71 — 1.80	82	86	90	92	94	97	99	100
1.81 — 1.90	80	84	88	90	93	96	98	100
1.91 — 2.00	77	82	86	88	91	94	97	99
2.01 — 2.10	74	79	83	86	90	93	96	98
2.11 — 2.20	70	75	80	84	88	91	94	97
2.21 — 2.30	66	72	77	82	86	89	92	95
2.31 — 2.40	61	68	73	78	83	87	90	93
2.41 — 2.50	56	63	69	75	80	84	88	91
2.51 — 2.60	50	57	64	71	77	82	86	89
2.61 — 2.70	44	53	60	67	73	78	83	87
2.71 — 2.80	39	48	56	62	68	74	79	83
2.81 — 2.90	34	43	51	58	64	69	73	77
2.91 & Up	30	38	46	53	60	64	67	70

TABLE D

HOT SPOT THRESHOLD VALUE

HOT SPOT LOAD THRESHOLDS			
SWITCHING MACHINE TYPE	LOAD UNIT		THRESHOLDS (BH CCS)
No. 1 ESS Switch	Heavy	2 :1LJR	313
		2.5:1LJR	263
		3 :1LJR	229
		3.5:1LJR	208
		4 :1LJR	188
	Regular	4 :1LJR	303
		5 :1LJR	256
		6 :1LJR	223
		7 :1LJR	199
		8 :1LJR	182

TABLE E

INDEX CORRECTION TABLE

HOT SPOT PENALTY POINT FRACTION	HOT SPOT CORRECTION
0.00 — 0.01	0
0.02 — 0.03	1
0.04 — 0.06	2
0.07 — 0.11	3
0.12 — 0.19	4
0.20 — 0.31	5
0.32 — 0.49	6
0.50 — 0.74	7
0.75 — 0.24	8
1.25 — 1.99	9
2.00 & Up	10

TABLE F

LOAD BALANCE SYSTEM OUTPUT REPORTS

INFORMATION		NUMBER	TITLE
Error Reports		TL700	Study Errors
		TL701	Measurement Errors
		TL702	History Change Processing/Errors
(Interim)	——→	TL720	Traffic Unit Index — Addendum
(Final)	*	TL721	Traffic Unit Index — Listing
Index Results: Hierarchy of Responsibility		TL722	LBI — Responsibility Code Group Summary — Cover Sheet
		TL722	LBI — Responsibility Code Group Summary
		TL723	LBI — District Summary — Cover Sheet
		TL723	LBI — District Summary
		TL724	LBI — Division Summary — Cover Sheet
		TL724	LBI — Division Summary
		TL726	LBI — Area Summary
		TL728	LBI — Company Summary
Three-Month Trend For All Concentrators	*	TL732	Index Study — Data Summary
		TL734	Second Session Study — Data Summary
		TL744	Line Assignment Guide — Cover Sheet
		TL744	Line Assignment Guide (LAG)
(Use in non-COSMOS office)→		TL745	Line Assignment Guide — Condensed
		TL746	Line Equipment Transfer (LET)
(Use in non-COSMOS office)→		TL747	Line Equipment Transfer — Condensed
		TL766	Selected Report — Trunk Link Network

*Key LBS outputs for examining load balance results by concentrator.

TABLE G

TLN CAPACITY

1024 TLN				
			CCS CAPACITY	
TJR	TLN SIZE	NO. OF TSC	TSC	GRID
1.00:1	1024	4	4600	1150
1.25:1	1280	5	3680	920
1.50:1	1536	6	3060	765
1.75:1	1792	7	2620	655
2.00:1	2048	8	2300	575

2048 TLN				
			CCS CAPACITY	
TJR	TLN SIZE	NO. OF TSC	TSC	GRID
1.00:1	2048	8	4600	1150