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# 5ESS® SWITCHING EQUIPMENT
# ECL BUS UNIT
# (EBUS)
# CIRCUIT

*Description of Changes*

Changes in the feature option table now reference apparatus for the switching module (SM) and new feature SM2000. Apparatus is now ordered by bay or cabinet not by SM count.

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DEPT NA5360100-CEH-DJS

# 5ESS® SWITCHING EQUIPMENT
# ECL BUS UNIT
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# CIRCUIT

*Description of Changes*

No changes occurred in this issue of the drawing. The schematic drawing (SD) was migrated from time sharing option (TSO) to systems computer aided design (SYSCAD).

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# 5ESS™ SWITCHING EQUIPMENT
# ECL-BUS UNIT
# CIRCUIT

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## SECTION I - GENERAL DESCRIPTION

### 1. PURPOSE OF CIRCUIT

1.01 This section provides a high-level view of the emitter coupled logic bus (EBUS).

1.02 The EBUS is a cabling scheme to distribute data, clock, and control, internally throughout the communications module model 2 (CM2) using a medium (the EBUS) with high-quality transmission characteristics.

### 2. GENERAL DESCRIPTION OF OPERATION

2.01 The EBUS is the heart of the CM2 cabling scheme. It is a series of multilayer backplanes, connected in series by coaxial ribbon cable. This arrangement provides more flexibility than an average cable because circuit packs can be plugged into this EBUS and can directly access the signals it carries through backplane pins.

2.02 The interconnections that the EBUS provides are broken down into three major areas: data, clock, and control.

DATA

2.03 The UN182 shelf utility board (SUB) puts 65Mb/s of data onto the EBUS, which distributes the data via the UN310 or UN316, to the appropriate KBN1, 4 fabric boards.

CLOCK

2.04 The TN881 clock interface provides 65MHz clock and 8KHz sync to the SUB, fabric boards and KBN2 fabric control boards, via the EBUS.

CONTROL

2.05 The UN183 TMS interface board puts 32MHz control data and address on the EBUS for distribution to the SUB. Return 32MHz control data and address are returned from the SUB over the EBUS to the UN183, UN321. Mux control from the UN183, UN321 is distributed via the EBUS to the SUB. Errors from the TMSU2 are distributed via the EBUS from the UN182 SUB to the UN183, UN321 TMS interface board.

## SECTION II - DETAILED DESCRIPTION

### 1. CIRCUIT PACKS

1.01 The following are the circuit packs that can be used in an EBUS:

UN197 Mux control board

UN198 Loop board

UN310 Data end tap board

UN311 Data tap board

UN312 Transmit clock end tap board

UN313 Transmit clock tap board

UN500 Transmit control repeater board

UN501 Transmit data repeater board

UN503 Receive data repeater board

UN504 Receive control repeater board

1.02 Many of the pack positions in the EBUS can accept multiple circuit pack codes, depending on equipage and system side. Refer to the EBUS Specifications Document SD5D085 for more details on these different combinations.

### 2. FUNCTIONS

2.01 This discussion is made easier by dividing the functions of the EBUS into three major portions: data, clock, and control.

DATA

2.02 For clarity, the EBUS is divided into two halves: receive and transmit (Figure 1). The receive portion (first half) is from the point of signal origination to the point where the bus is looped back. The transmit portion (second half) is from the point where the bus is looped back to the point where the signals are terminated.

2.03 The UN182 SUB puts 65Mb/s of data, destined for the KBN1, 4 Fabric Board, onto the receive side of the EBUS via coaxial ribbon cable (Figure 2). The data is tapped from the transmit side of the EBUS by either a UN310 Data End Tap Board or a UN311 Data Tap Board, and is distributed to a KBN1 Fabric Board via coaxial ribbon cable. Data on the EBUS is repeated with UN501 and UN503 data repeater boards.

CLOCK

2.04 The TN881 clock board provides 65MHz clocks and 8KHz sync pulses to the receive side of the EBUS via

coaxial ribbon cable (Figure 3). The UN197 Mux control board taps the clock signal from the receive side and distributes the 65MHz clock to the UN182 SUB via coaxial ribbon cable. The 65MHz clock is tapped on the transmit side by either a UN312 Clock End Tap Board or a UN313 Clock Tap Board; it is then distributed to the KBN1 Fabric Boards and the KBN2 fabric controller boards by coaxial ribbon cable. The EBUS also sends a 65MHz clock to the UN183 TMS interface board via coaxial ribbon cable for use in clocking in the return 32MHz control data. The UN500 and UN504 repeater boards are used to repeat these clock and sync signals.

CONTROL

2.05 The control portion consists of three basic parts: 32MHz control address and data, mux control, and errors.

2.06 The UN183 TMS interface board puts 32MHz control address and control data on the receive side of the EBUS via coaxial ribbon cable (Figure 4). These signals are tapped off the EBUS by the UN197 Mux control board and distributed to the UN182 SUB via coaxial ribbon cable. Each SUB then puts its return control data back onto the receive side of the EBUS and sends it down the bus to the UN183.

2.07 MUX Control is put on the EBUS by the UN183 TMS Interface Board via coaxial ribbon cable and is tapped from the receive side of the bus by the UN197 Mux Control Board (Figure 5). The mux control leads are cabled from the UN197 to the UN182 in the TMSU.

2.08 The error leads are put on the EBUS by the UN182 SUB and are tapped off the bus by the TN884 TMS Control Board (Figure 6).

REPEATER BOARDS

2.09 The repeater boards, UN500, UN501, UN503, and UN504, perform a low-profile, yet very important function in the EBUS. These boards reclock and buffer the signals on the EBUS, every two bays, so that signal loss and degradation are kept to a minimum. The repeater boards are transparent to the normal signal flow and do not affect system operation or timing. Refer to the EBUS Specifications Document (SD5D085) for a detailed discussion on how these packs are equipped.

POWER

2.10 The EBUS has no power supplies or control and display packs that reside within the unit. The power is supplied and controlled from the TMSU2.

## SECTION III - REFERENCE DATA

### 1. WORKING LIMITS

1.01 None.

### 2. FUNCTIONAL DESIGNATIONS

| DESIGNATION | MEANING |
|---|---|
| CMCU | Communications Module Control Unit |
| CM2 | Communications Module Model 2 |
| EBUS | Emitter Coupled Logic Bus |
| TMS | Time Multiplexed Switch |
| TMSU2 | Time Multiplexed Switch Unit Model 2 |

## 3. CONNECTING CIRCUITS

3.01 The EBUS connects to the following units and circuit packs:

| Unit | Circuit Pack |
|---|---|
| TMSU2 | UN182 Shelf Utility Board |
| | KBN2 Fabric Controller Board |
| | KBN1, 4 Fabric Board |
| | SN516 Control & Display |
| | 410CA -2 volt Power |
| | 410AA -5 volt Power |
| CMCU | UN321 TMS Interface Board (S.F.) |
| | UN183 TMS Interface Board |
| | TN881 Clock Interface Board |
| | TN884 TMS Interface Board |
| | KAA5 Termination Paddle Board |

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## SECTION IV - REASONS FOR REISSUE

### B. Changes in Apparatus

B.1 Added APP FIG. 21 and APP FIG. 22.

B.2 Changed APP FIG. 11 and APP FIG. 12.

### D. Description of Changes

D.1 Added "V" wrg and clarify "Y" wrg to allow complete testing of EBUS units in bays 4 through 7.

D.2 Corrected UN503 equipage in bays 2 and 9 for dual fabric.

D.3 Updated net names for UN500 and UN504.

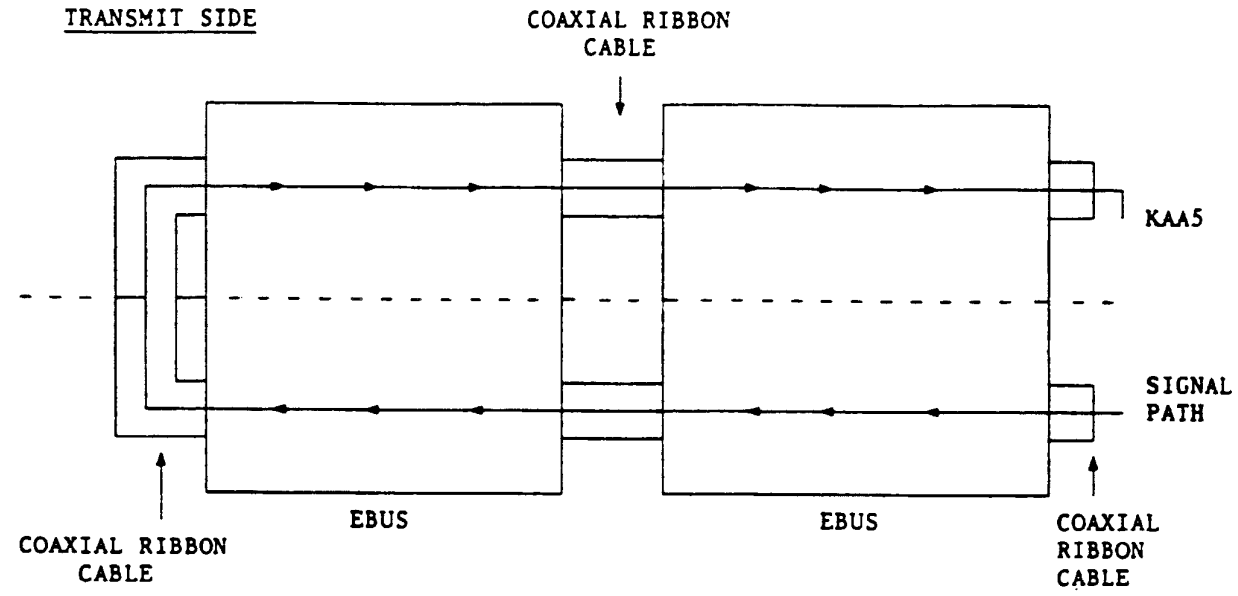


**Figure 1. EBUS Block Diagram**

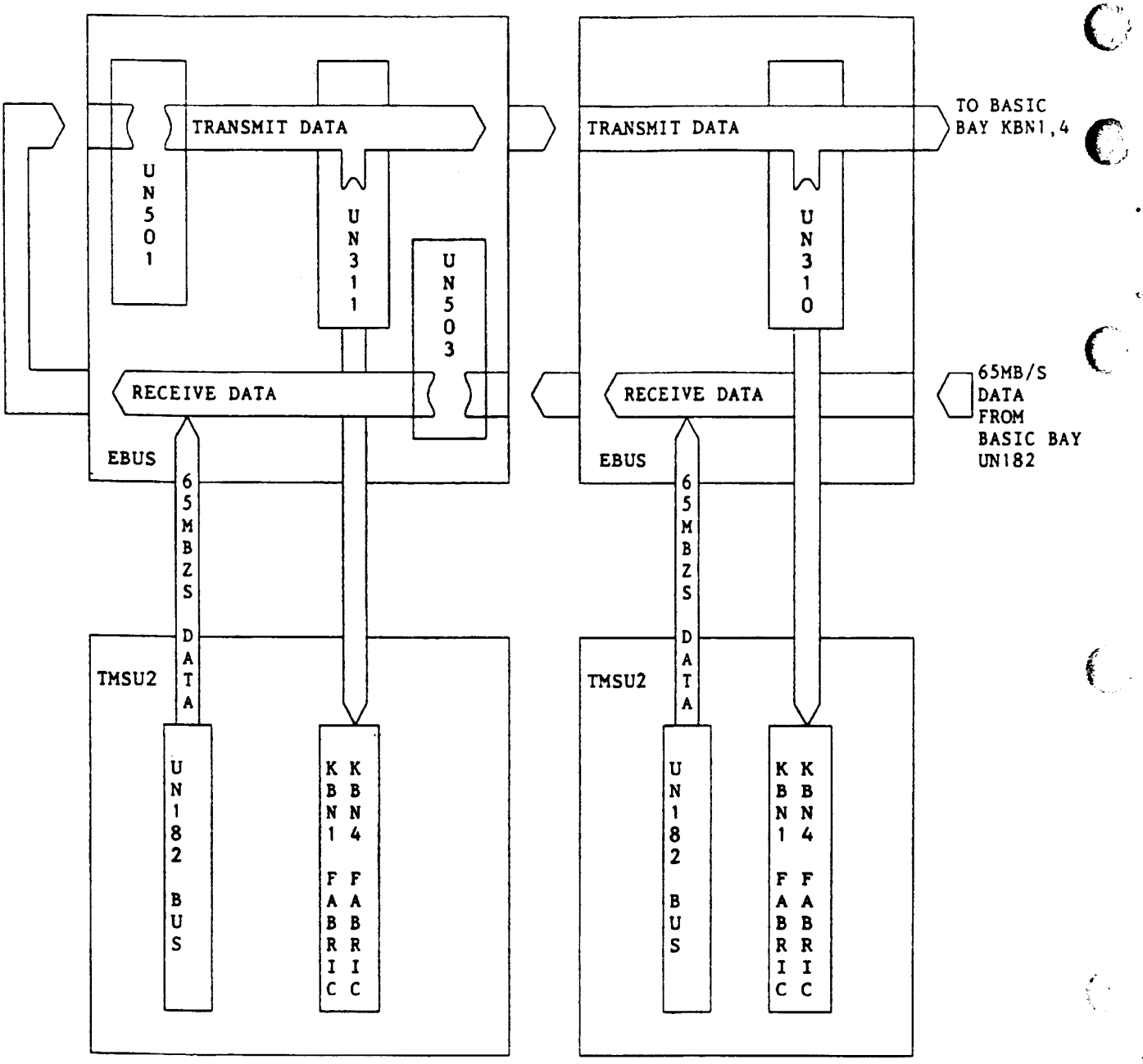


**Figure 2. Data**

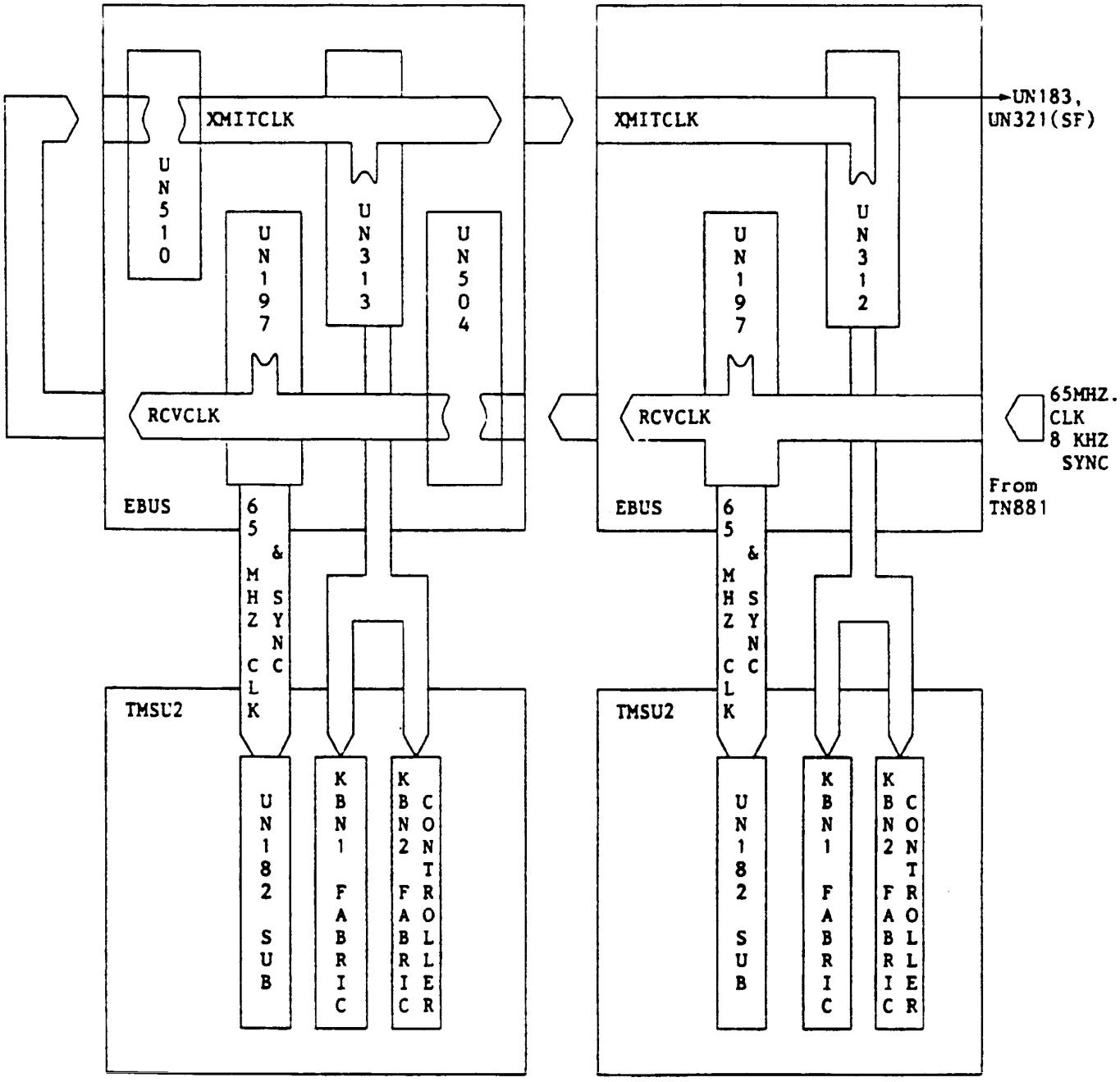


**Figure 3. Clock**

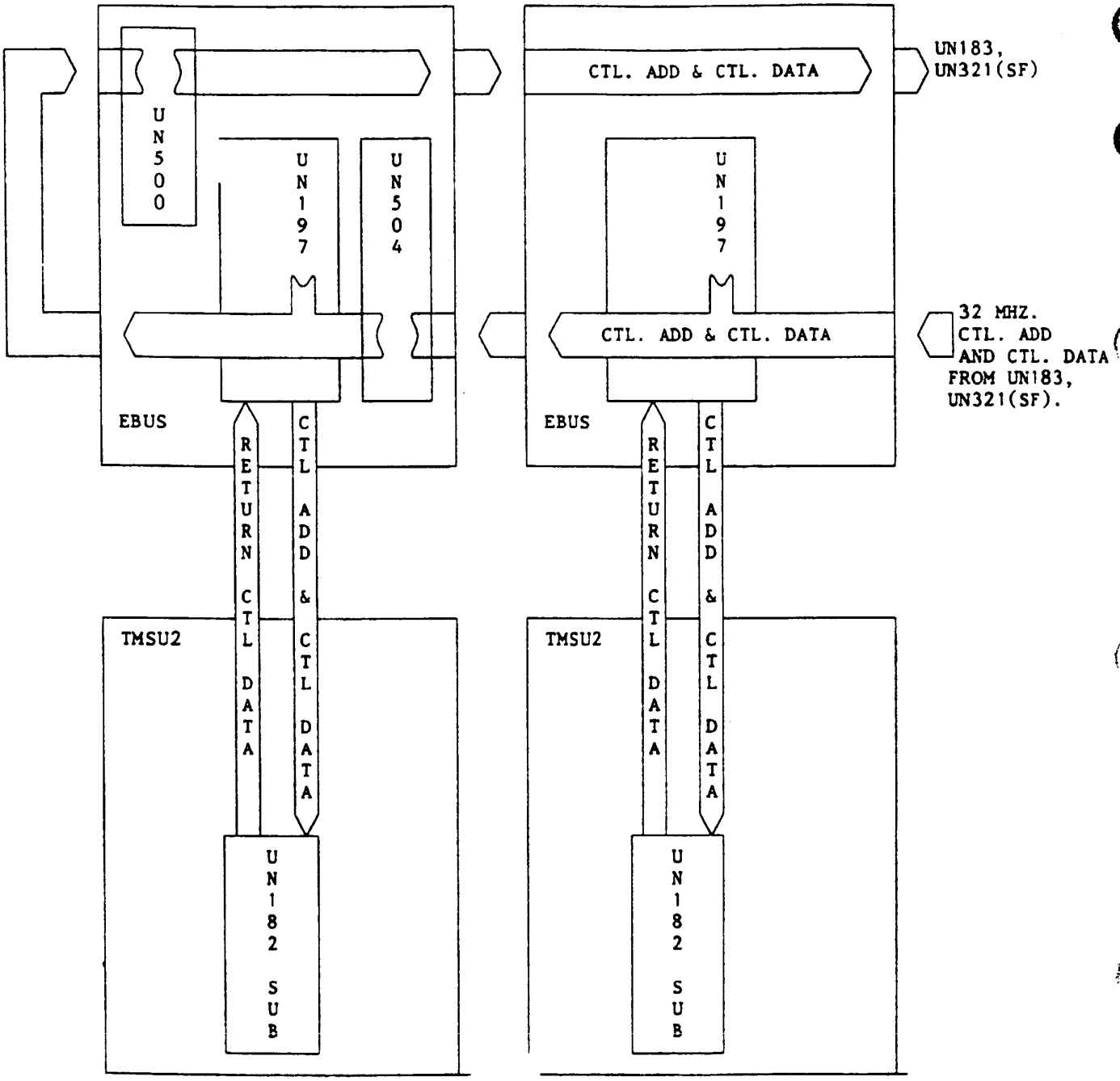


**Figure 4. Control: 32MHz Address and Data**

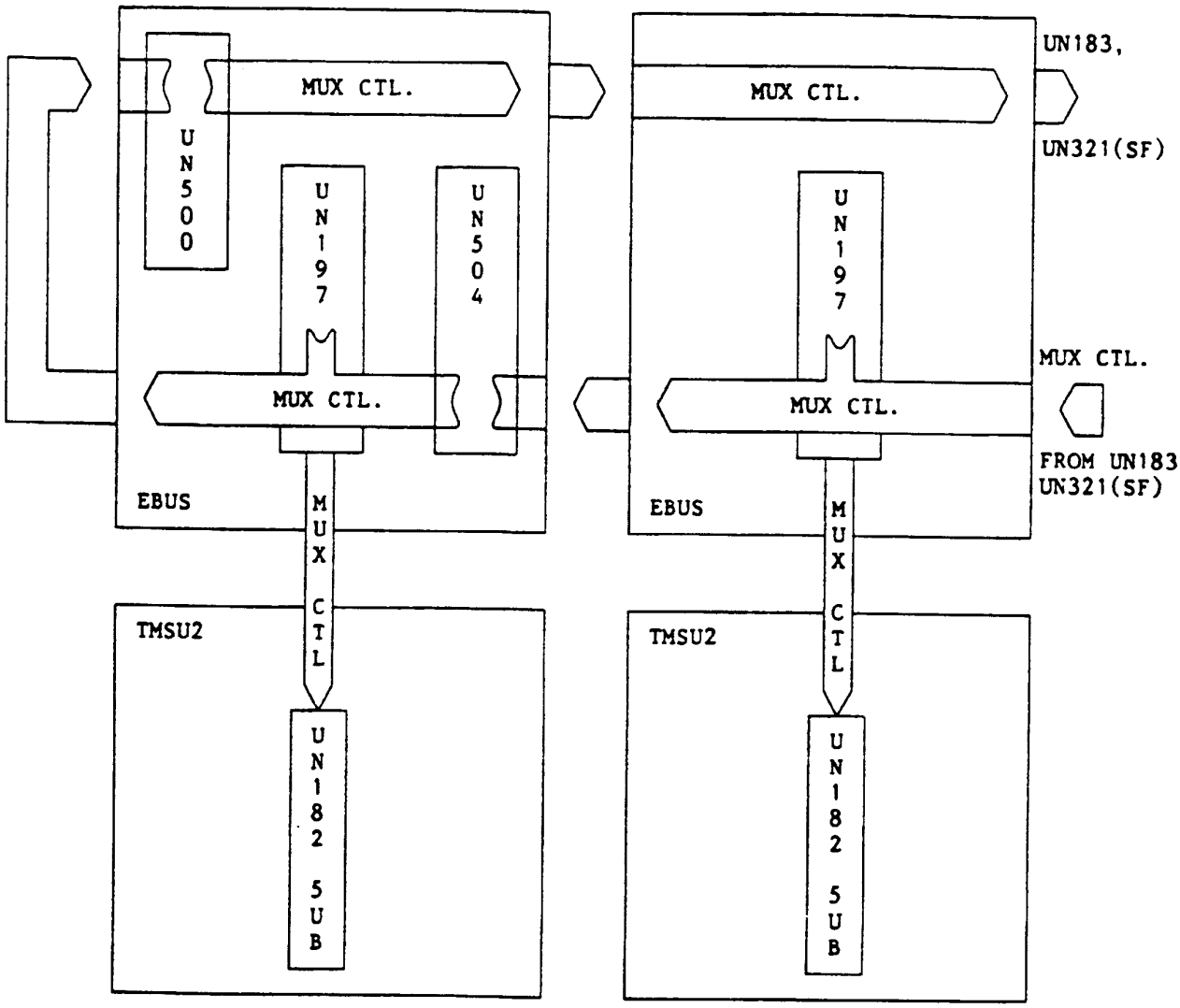


**Figure 5. MUX Control**

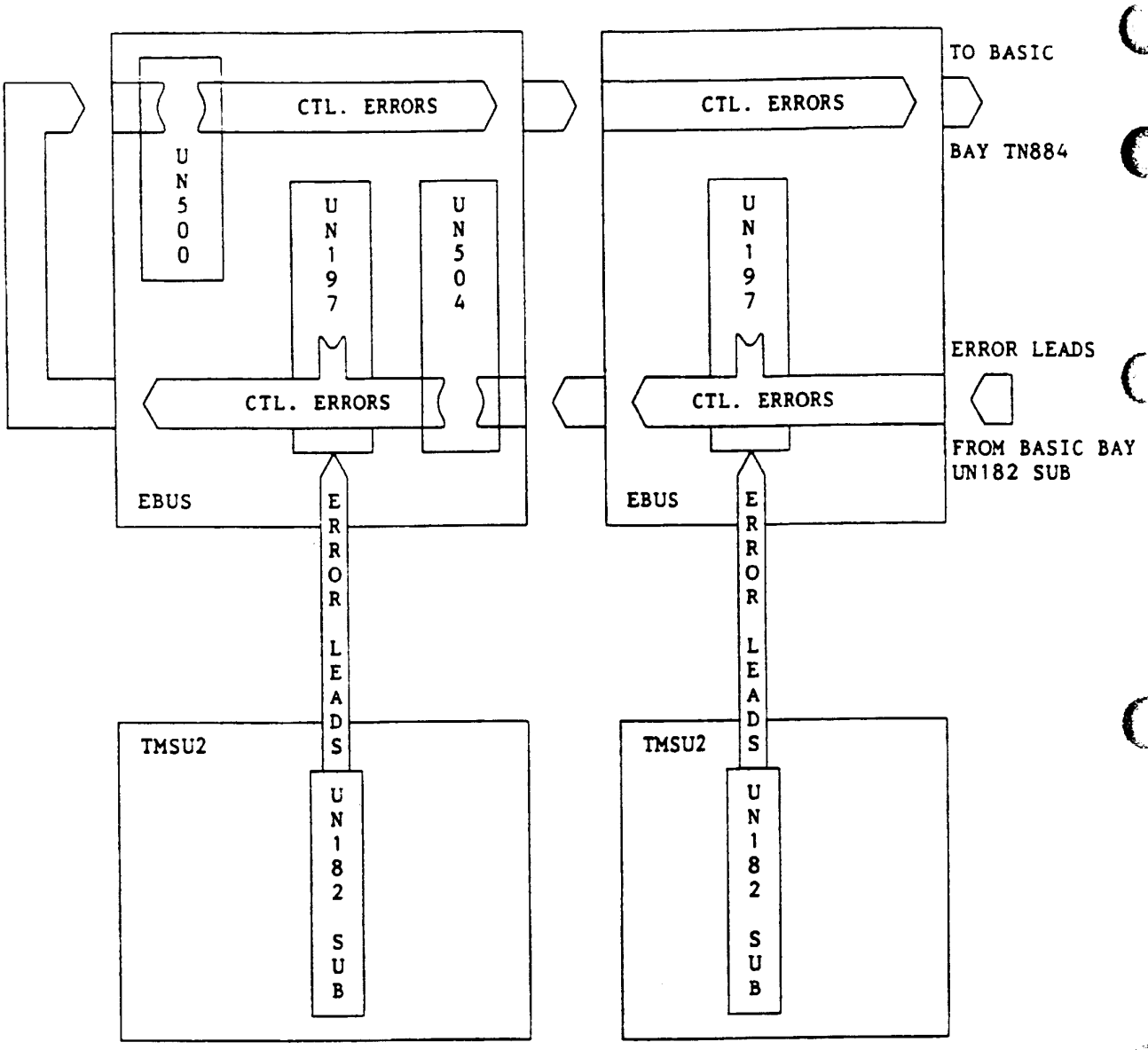


**Figure 6. Control: Errors**