

5ESS® SWITCHING EQUIPMENT
FUSE/FILTER PANEL
CIRCUIT

CHANGES

B. Changes in Apparatus

B.1 Removed

R5.0 KS-20289, L6C, 2610
Resistor, App Fig. 1.

CR9 549A
Diode, App. Fig. 1.

Removed Replaced By

ED-5D521-30,G1 ED-5D521-30,G2B
App. Fig. 1 App. Fig. 1

D. Description of Changes

- D.1 To reduce cost, the resistor (R5) and LED (CR9) have been removed on Sheet C1.
- D.2 The alarm board has been changed from A Group 1 to A Group 2B on Sheets B2 and C1.

F. Changes in Description of Operation or Changes in CD Sections

- F.1 Remove the reference to the illumination of light-emitting diode on Page 2 and 3.

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DEPT 55535-TPG-JCB

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5ESS™ SWITCHING EQUIPMENT
TIME MULTIPLEXED SWITCH UNIT
CIRCUIT

CHANGES

B. Changes in Apparatus (Components)

Superseded

Superseded By

982CG,CF Fiber Optic
RCV/TRANS connectors in
FIG. 2-17 "F" option

982TA,WY Fiber Optic
RCV/TRANS connectors in
FIG. 2-17 "E" option

D. Description of Changes

D.1 Fiber Optic connectors are introduced to provide for TRM (TRANSMISSIONLESS REMOTE MODULE). FS 2, CADs 6 and 7, APP FIG. 2-17 and Feature Table are changed to show 982CG,CF designated "F" Option and APP 982TA,WY per "E" Option.

D.2 In CADs 6, 7, and FS 2, reference is added to a new connecting circuit for O.R.M. - Transmission Rate Converter Unit, SD-5D086-01.

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AT&T-T DEPT 11NW527280-REG-EBH

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SESSTM SWITCHING EQUIPMENT
TIME MULTIPLEXED SWITCH UNIT
CIRCUIT

SECTION I - GENERAL DESCRIPTION1. PURPOSE OF UNIT

1.01 The function of the Time Multiplexed Switch Unit (TMSU) is to provide switched connections for data transfer between Switch Modules (SMs). Control information from the Control Processor (CP) to any SM is also transferred through the TMSU fabric.

1.02 The TMSU fabric is equipped as needed. It can grow to a 32 by 32 matrix for a fully equipped unit. A fully equipped unit will handle communication between 30 SMs, communication from CP to any SM, and diagnostic test access to the fabric itself.

1.03 The connections through the TMSU fabric are reconfigured 256 times during one data frame (of 256 time slots). Configuration information for the fabric during each of the 256 time slots is supplied by the Time Multiplexed Switch Control Unit (TMCU). Configuration of the fabric is different for each of 256 time slots, therefore, the connection configuration information is stored in a 256 byte RAM by the TMSU and is cycled through by the TMS clock.

1.04 Data enters and leaves the TMSU serially at a 32 Mb rate by way of Network Control and Timing Links (NCTs). Physically, NCT links are optical fibers. Each SM requires two NCT links to connect to the two

(even and odd) TMSUs needed for simplex operation.

SECTION II - DETAILED DESCRIPTION1. SHELF INTERFACE (TN244)

1.01 TN244 is the Shelf Interface (SI) circuit pack. The SI distributes control messages received from the TMS interface to each 32 by 4 fabric board and Link Interface (LI) board on its shelf. The SI receives a 40-bit message from the TMS interface, 5 bits of which are compared to a hardwired address corresponding to the shelf ID upon which the SI pack resides.

1.02 The SI has two error source registers. Error source register 1 contains the error status of each 32 by 4 fabric board and each LI board located on that shelf. Error source register 2 contains the errors attributed to hardware on the SI and incoming data parity errors. Each bit of the error source registers can be marked to inhibit error reporting via a command from the TMS interface. A TMSU has two SIs (TN244s), one for each shelf.

2. LINK INTERFACE (TN243)

2.01 The TN243, LI provides an interface between the NCT links and the switching fabric. Each LI pack terminates two NCT links and performs the general function of synchronizing the data from the NCT link with the

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internal TMS clock for transmission through the fabric. The latter is accomplished by an elastic buffer implemented with RAM. Control instructions for the LI are sent from the SI as 4 byte messages.

2.02 Another function of the LI is to split data for easier passage through the fabric. Serial data from the 32 Mb NCT links is divided into two 16 Mb data streams for input to the fabric. Two 16 Mb serial outputs from the fabric are combined for 32 Mb NCT link transmission. A TN243 pack can then transmit and receive all even or all odd time slots for two SMs.

3. FANOUT BOARD (UN74)

3.01 The fanout board (UN74) provides distribution of clock signals and data within the TMSU. There is one fanout board per shelf.

4. FABRIC BOARD (TN242)

4.01 The fabric board (TN242) provides a switched connection for data

flow from transmitting to receiving LIs. This is accomplished by utilizing dual 32 by 4 multiplexers, allowing each fabric board to handle four output links. The duality arises because the LI board transmitting data to the fabric has split the 32 Mb data stream into two 16 Mb data streams. Data enters the fabric from an LI and is output to another LI.

4.02 Control information is sent to the fabric boards by the SI on the same shelf. Received control (configuration) information is stored in a 256 byte RAM and is used to provide a new set of connections for each time slot.

SECTION III - REFERENCE DATA

1.01 See the individual circuit pack CDs.

SECTION IV - REASON FOR REISSUE

1.01 To correct previous issues of this CD.

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DEPT 55612-MEB-DWZ

Each unit also contains an alarm circuit pack to: collect alarms for these fuses, provide an LED fuse alarm indication, transmit an electrical fuse alarm signal, and light the cabinet fuse alarm LEDs. When List 3 or 7 is specified, it provides a Jack module to receive plugs for the TEL, SP, TTY A, and TTY B plugs. These have no functional connection with the fusing of SESS™; however, for convenience, they are located in the fuse/filter unit.

1.02 To receive the push-on receptacles for the load power wiring, the rear panel of each fuse/filter unit is arranged with two large tab-type terminal strips. A small terminal strip is provided for pluggable connectors for fuse alarms and also for the TEL, SP, TTY A, and TTY B functions. This terminal strip has pairs of terminals made common in its printed wiring pattern, such that two connectors plugged into it, side-by-side, will have identical signals present. These carry alarm and jack module mults down the line-up. To collect fuse alarm circuits, as required, the terminal strip may also have wire jumper strapping. Only one set of straps need be installed for each pair of connectors because of the terminals being made common in the wiring pattern.

2. ALARMS

2.01 Alarms receive special treatment because occasionally the circuit used requires that more than one alarm per feeder from the power distribution plant be used. Therefore, on each feeder of the 12 load positions provided, eight have one alarm signal, and the other four have a separate alarm signal. If List 2 or 6 is specified, the alarms for the four additional type-70 fuses, or for the four type-74 fuses, are combined with the four positions of the lower List 1 or 5 fuses. This combination results in a total of eight fuses for each circuit on each of the alarms. If these separate alarms are required,

they can be obtained through proper selection of load-fuse assignments. The separate alarms are then available through selection of the corresponding alarm terminal numbers of the alarm circuit pack. If separate alarms are not required, the alarm terminals at the alarm circuit pack can be connected, as required, on the small terminal strip at the back of the unit.

3. ALARM TESTING

3.01 Alarm testing is incorporated to ensure the proper functioning of both the fuse panel and the external wiring to the circuit being used. The alarm test leads introduce a -48 volt test voltage into the beginning of the series circuit that makes up the interconnected alarm terminals. If all wiring is proper and intact, the test voltage reaches the alarm circuit packs and indicates an alarm condition, both visually (light-emitting diode) and through electrical manifestation. The maintenance circuit of the equipment being used expects this response, and it indicates improper operation if the correct input signal is not received from the fuse panel.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

<u>1.01 Battery Symbol</u>	<u>Voltage Range</u>
-48V	-42.75 to -52.5V

2. FUNCTIONAL DESIGNATIONS

<u>Designation</u>	<u>Voltage</u>	<u>Bus</u>	<u>Meaning</u>
-48A00	-48	A	A bus, First feeder, Circuit 0
-48A11	-48	A	A bus, Second feeder, Circuit 1
-48A20	-48	A	A bus, Third feeder, Circuit 0

<u>Designation</u>	<u>Voltage</u>	<u>Bus</u>	<u>Meaning</u>	<u>Designation</u>	<u>Voltage</u>	<u>Bus</u>	<u>Meaning</u>
-48A31	-48	A	A bus, Fourth feeder, Circuit 1	RTNB00	-48	B	Circuit 1 Return for B bus,
-48A40	-48	A	A bus, Fifth feeder, Circuit 0	RTNB11	-48	B	First feeder, Circuit 0 Return for B bus,
-48A51	-48	A	A bus, Sixth feeder, Circuit 1	RTNB20	-48	B	Second feeder, Circuit 1 Return for B bus,
-48B00	-48	B	B bus, First feeder, Circuit 0	RTNB31	-48	B	Third feeder, Circuit 0 Return for B bus,
-48B11	-48	B	B bus, Second feeder, Circuit 1	RTNB40	-48	B	Fourth feeder, Circuit 1 Return for B bus,
-48B20	-48	B	B bus, Third feeder, Circuit 0	RTNB51	-48	B	Fifth feeder, Circuit 0 Return for B bus,
-48B31	-48	B	B bus, Fourth feeder, Circuit 1	FB01018	-48	-	Sixth feeder, Circuit 1 Fuse block at EQL 01-018
-48B40	-48	B	B bus, Fifth feeder, Circuit 0	10184T	-48	-	Fuse block at VEQL 01, HEQL 018, load fuse 4T
-48B51	-48	B	B bus, Sixth feeder, Circuit 1	10184TR	-48	-	Fuse block at VEQL 01, HEQL 081, return for load fuse 4T
FA0	-48		Fuse alarm	02-020,03	-48	-	Terminal strip at VEQL 02, HEQL 020, terminal 03 (Connection for 1018 4T)
RTNA00	-48	A	Return for A bus, First feeder, Circuit 0	01-143,207	-	-	Terminal strip at VEQL 01, HEQL 043, Column 2, Row 07 (Connection for fuse alarm FA0)
RTNA11	-48	A	Return for A bus, Second feeder, Circuit 1	CP1	-48	-	Fuse alarm circuit pack
RTNA20	-48	A	Return for A bus, Third feeder, Circuit 0				
RTNA31	-48	A	Return for A bus, Fourth feeder, Circuit 1				
RTNA40	-48	A	Return for A bus, Fifth feeder, Circuit 0				
RTNA51	-48	A	Return for A bus, Sixth feeder,				

3. FUNCTIONS

3.01 Provides equipment load fusing for up to 16 circuit 0 loads and up to 16 circuit 1 loads per fuse panel, or up to 32 circuit 0 loads, or up to 32 circuit 1 loads per fuse panel.

3.02 Provides visual and electrical fuse alarm indications for each bus.

3.03 Provides alarm circuit testing capability.

4. CONNECTING CIRCUITS

4.01 When this circuit is listed on a keysheet, the connecting information thereon is to be followed:

- (a) Fuse/Filter Panel Unit J1A053AU-1 or 2.
- (b) Appropriate SESS Frame Schematic Drawing.
- (c) Appropriate SESS Equipment Unit Schematic Drawings.

5. MANUFACTURING TESTING REQUIREMENTS

5.01 None.

6. ALARM INFORMATION

6.01 Electrical alarm signal indications are sent to the switch module controller unit and time slot interchanger unit control and display circuit pack SN 412 or SN516. This pack relays the information to the processor cabinets over the optical fiber data link.

7. TAKING EQUIPMENT OUT OF SERVICE (TEOS)

7.01 Any group of 12 or 16 load fuses can be taken out of service by first powering down all equipment units using those fuses (in accordance with system operational guidelines). Then the appropriate power distributing frame fuse assigned to the feeder for the 12 or 16 fuses can be removed.

7.02 To power up a group of 12 or 16 load fuses, insert the feeder fuse at the power distributing frame; this is done only after properly using the charging circuit and tool at that frame. With the feeder energized, the equipment units are powered up individually through operation of the START pushbuttons on their power units, as described in the appropriate system operational guidelines.

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