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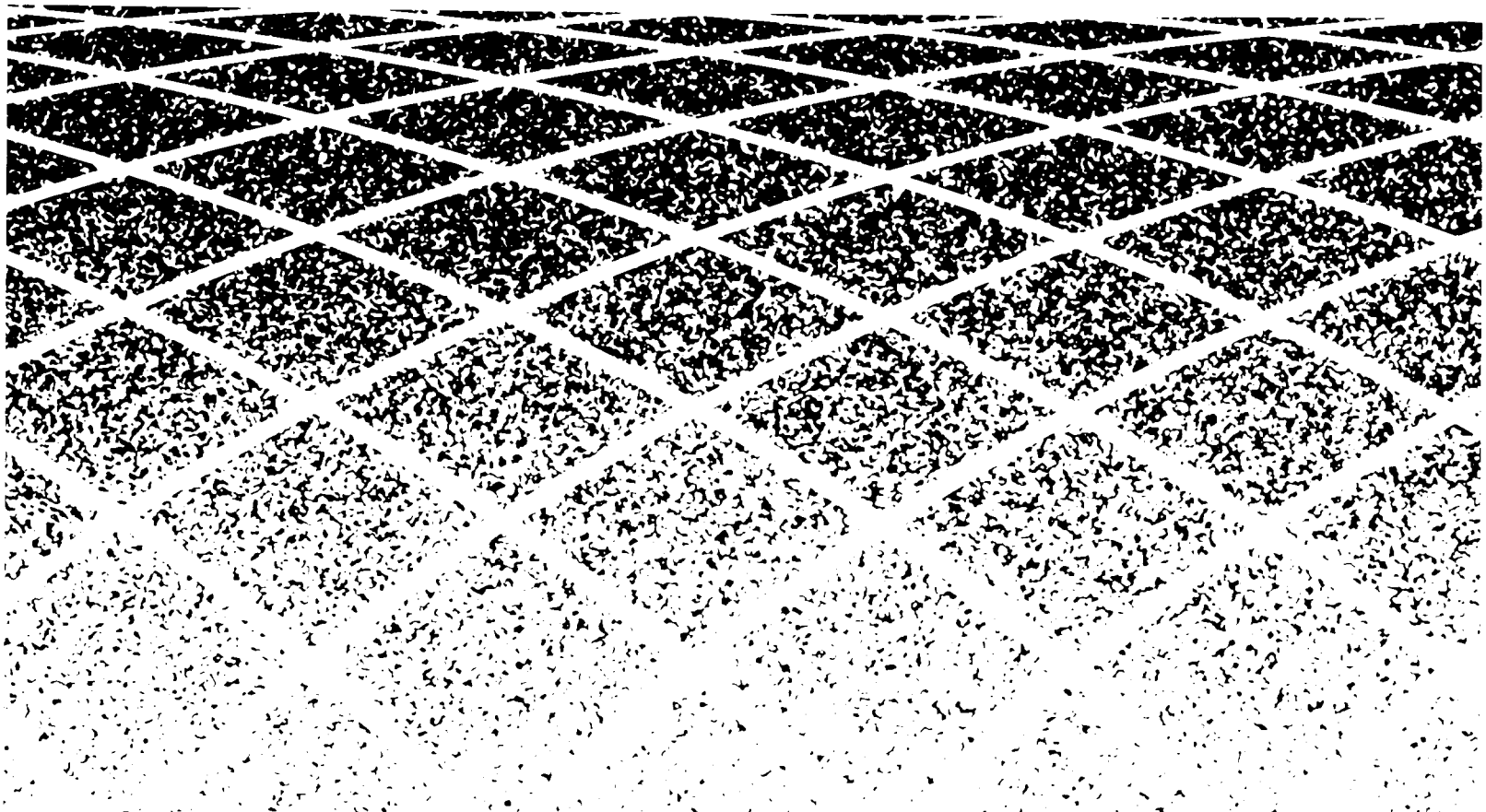
DACS II
DS1 Multipoint Junction Unit (MJU) Shelf

Description, Operation, and Maintenance



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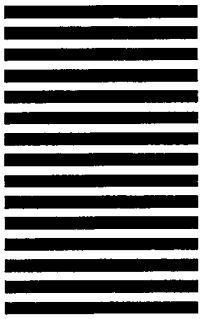

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Overview

1

The Digital Access and Cross-Connect System II (DACS II) DS1 Multipoint Junction Unit (MJU) Shelf provides DACS II customers with the ability to support 19.2 kb/s MJU functions, including error correction and secondary channel capabilities. Once the DS1-MJU Shelf is installed and cabled to the DACS II, all circuit level operations (for example, provisioning, testing, etc.) are provided via standard DACS II administration.

Features and Benefits

The benefits for supporting 19.2 kb/s multiplexing and multipoint circuits include the following.

- The DS1-MJU Shelf allows DACS II customers to offer 19.2 kb/s MJU services today, minimizing initial investment as customers determine future service demands.
- The DS1-MJU Shelf supports DDS secondary channel and 19.2 kb/s error correction for full service compatibility and quality. This support is in compliance with the American National Standard for Telecommunications - Digital Hierarchy - Format Specifications, ANSI T1.107b, 199X and the Bell Communications Research Digital Data System (DDS) Multipoint Junction Unit Requirements TA-TSY-000192.
- The 19.2 kb/s subrate multiplexing is currently supported by DACS II's Subrate Feature. Therefore, only the multipointing (MJU function) capability requires the DS1-MJU Shelf.
- The DS1-MJU Shelf is modular and easily grows in capacity (from four to forty-eight 19.2 kb/s MJU functions) as customer demand increases.

- The DS1-MJU Shelf contains no DS0A wiring, thereby eliminating the risk of service interruption due to distributing frame activity.
- Once the DS1-MJU Shelf is installed, it no longer requires subsequent hands-on work for provisioning multipoint circuits. All circuit level administration is done remotely through the DACS II.
- The 19.2 kb/s MJU uses industry standard circuit design procedures for provisioning MJU circuits.
- Standard DACS II test access commands are used to gain DS0 test access for any leg in the multipoint circuit, providing remote testing and trouble isolation.
- The DACS II and the DS1-MJU Shelf provide alarms to isolate equipment and facility failures.

These key points all contribute to an administrative environment that is consistent with current DACS II networks and offers service providers with an efficient and effective method for providing 19.2 kb/s services to their customers.

Equipment Description

Each DS1-MJU Shelf supports from four to forty-eight 19.2 kb/s MJU functions on 1 to 12 DS1-MJU circuit packs (see Figure 1-1).

For economic startup, the DS1-MJU Shelf can be equipped with a single DS1-MJU circuit. Additional DS1-MJU circuit packs may then be added in-service to the DS1-MJU Shelf for future growth. Each DS1-MJU circuit pack provides four 19.2 kb/s MJU functions and supports both subrate error correction and full secondary channel capabilities.

The DS1-MJU Shelf is mounted in a separate equipment bay and is cabled to the DACS II at the DS1 level. Although the DS1-MJU Shelf can be located anywhere (up to a maximum of 655 feet from DACS II, depending on the type of cable used), it is recommended that it be placed in the same lineup with the DACS II, leaving enough space for growth of standard DACS II Input/Output (I/O) bays. Standard DACS II Dual Digroup Circuit (DDC) packs provide the DS1 interfaces to the DS1-MJU Shelf. Up to 12 DS1s (1 DS1 for each DS1-MJU circuit pack) are used to cable each DS1-MJU Shelf to the DACS II. The DS1-MJU Shelf/DACS II interconnection is shown in Figure 1-2. Up to 6 DS1-MJU Shelves can be mounted in a 7-foot bay, providing a total of two hundred and eighty-eight 19.2 kb/s MJU functions per bay.

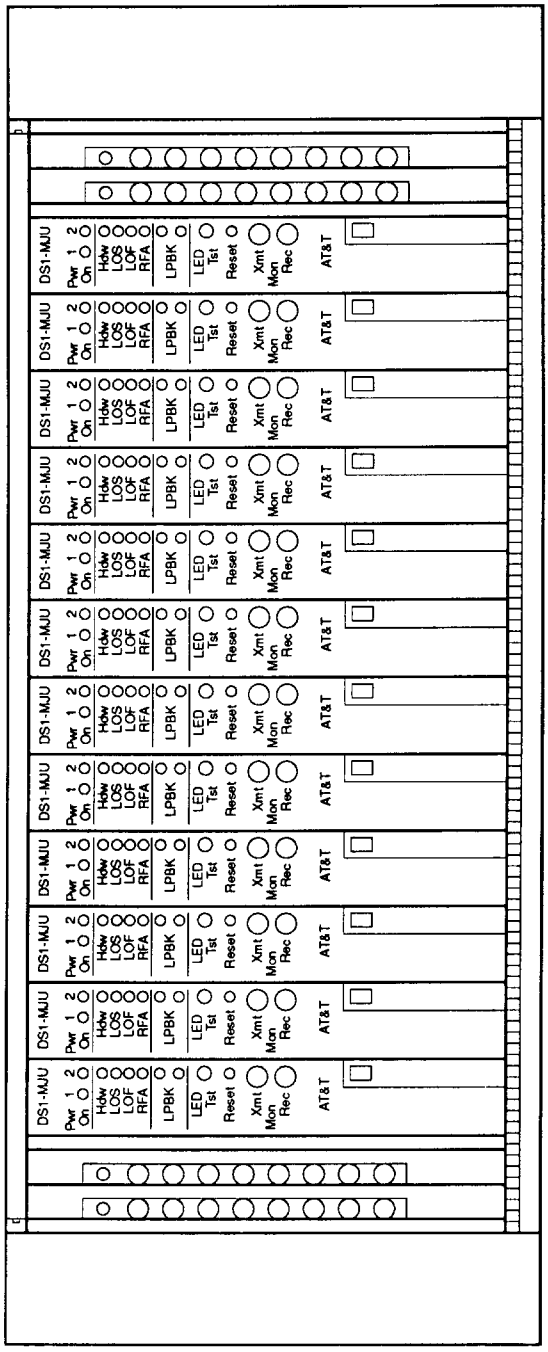

Figure 1-1. DACS II 19.2 kb/s Multipoint Junction Unit Shelf

For maximum flexibility and utilization of DACS II DS1 ports, all DS1 connections between the DS1-MJU Shelf and the DACS II should be made via the DSX-1. Once the MJU Shelf is installed and cabled to the DACS II, all subsequent circuit provisioning is provided via DACS II administration.

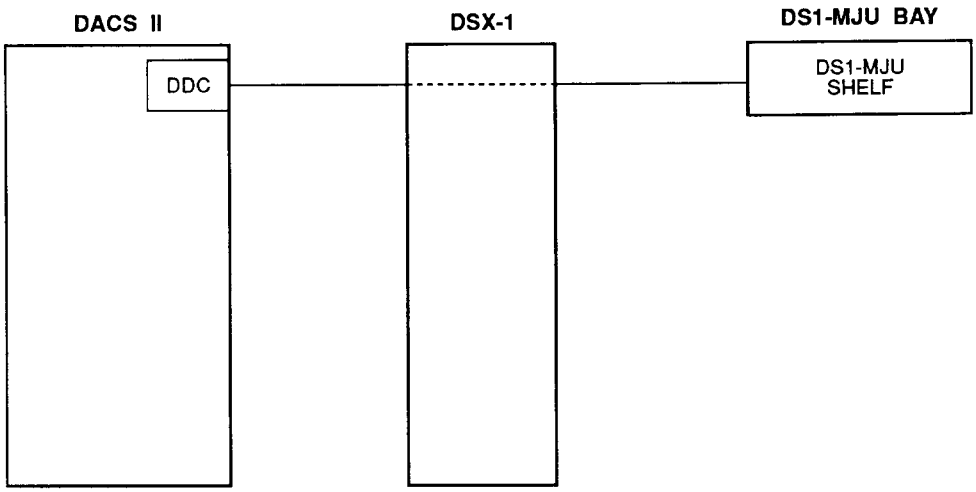

Figure 1-2. DACS II/DS1-MJU Interconnection

Provisioning

2

Provisioning DACS II NPCs

Overview: This procedure is used to enter information (grow) into the data base to provision the DACS II NPCs. Entered are the T1DM multiframe format, unassigned multiplex code, and enabling of the AIS to be alarmed.

1. Enter the command as follows:

   `GRTH::NPC <npc No.>,TYPE DExxx,IW X'18,AIS MJ` (for PDS) or

   `CRTE-EQPT::NPC <npc No.>,TYPE DExxx,IW X'18,AIS MJ` (for MML)

   where DExxx= DE420 – T1DM multiframe format with B8ZS (Bipolar with 8 Zero Substitution) line coding.

   DE400 – T1DM multiframe format with NZCS (No Zero Code Suppression) line coding.

   IW X'18= Unassigned Multiplex Code

   - If the command is denied, find the reason for denial and perform corrective action to obtain command completion.

2. Check the completion message to verify changes.

Change DS1 Equalizer Value on 19.2-kb/s MJU Plug-In

1. With the MJU circuit pack out of the shelf, locate the two miniature switches (DIP switches) on the component side of the MJU circuit board. These switches are located near the bottom edge.
2. Set the rockers on the DIP switch SW1 to select the required equalizer values based on the distance to the DSX-1 bay per Table 2-1.

   NOTE:
   To set a switch, push the rocker to the ON position.

   NOTE:
   The selected equalization will be effective when the circuit pack is inserted (with the reset that occurs when the MJU is powered up) and will be read again whenever the **RESET** button on the circuit pack is operated.

3. Repeat the procedure to set the equalizers on the other MJU circuit packs in the shelf.

Table 2-1. 19.2-kb/s Equalization Settings

Cable Length (Feet)		Switch Setting		
Type 609 (22 GA.)	Type 1249 (26 GA.)	Rocker 1	Rocker 2	Rocker 3
0 through 133	0 through 90	on	on	on
134 through 267	91 through 180	on	on	off
268 through 400	181 through 270	on	off	on
401 through 533	271 through 360	on	off	off
534 through 655	361 through 450	off	on	on

Provisioning of Line Coding

The DS1-MJU supports the following DS1 line codes that operate in conjunction with the T1DM framing format:

- Bipolar with 8 Zero Substitution (B8ZS)
- Alternate Mark Inversion (AMI) with No Zero Code Suppression (NZCS)

1. Set the rockers on DIP switch SW2 to select the line coding as shown in Table 2-2.

Table 2-2. Line Coding Switch Settings

	Position			
Line Code	1	2	3	4
B8ZS	OFF	X	X	X
AMI	ON	X	X	X

X = Don't Care

Change Hub ID on the Shelf

1. Locate the 6-position miniature switch (DIP switch) on the backside of the MJU shelf. This switch is the only one on the backside of the shelf, and it is located near the right-side edge.
2. Refer to Table 2-3 for selecting the correct settings on the switch.
3. Set the rockers on the DIP switch to select the required hub ID number.

Table 2-3. HUB ID Switch Setting (Note)

HUB ID	1	2	3	4	5	6	HUB ID	1	2	3	4	5	6
00	ON	ON	ON	ON	ON	ON	40	ON	ON	ON	ON	ON	
01		ON	ON	ON	ON	ON	41		ON	ON	ON	ON	
02	ON		ON	ON	ON	ON	42	ON		ON	ON	ON	
03			ON	ON	ON	ON	43			ON	ON	ON	
04	ON	ON		ON	ON	ON	44	ON	ON		ON	ON	
05		ON		ON	ON	ON	45		ON		ON	ON	
06	ON			ON	ON	ON	46	ON			ON	ON	
07				ON	ON	ON	47				ON	ON	
10	ON	ON	ON		ON	ON	50	ON	ON	ON		ON	
11		ON	ON		ON	ON	51		ON	ON		ON	
12	ON		ON		ON	ON	52	ON		ON		ON	
13			ON		ON	ON	53			ON		ON	
14	ON	ON			ON	ON	54	ON	ON			ON	
15		ON			ON	ON	55		ON			ON	
16	ON				ON	ON	56	ON				ON	
17					ON	ON	57					ON	
20	ON	ON	ON	ON		ON	60	ON	ON	ON	ON		
21		ON	ON	ON		ON	61		ON	ON	ON		
22	ON		ON	ON		ON	62	ON		ON	ON		
23			ON	ON		ON	63			ON	ON		
24	ON	ON		ON		ON	64	ON	ON		ON		
25		ON		ON		ON	65		ON		ON		
26	ON			ON		ON	66	ON			ON		
27				ON		ON	67				ON		
30	ON	ON	ON			ON	70	ON	ON	ON			
31		ON	ON			ON	71		ON	ON			
32	ON		ON			ON	72	ON		ON			
33			ON			ON	73			ON			
34	ON	ON				ON	74	ON	ON				
35		ON				ON	75		ON				
36	ON					ON	76	ON					
37						ON	77						

Note: The switch is located at the rear of the MJU shelf. All the blank positions in the table be set to OFF.

NOTE:
The selected hub ID will be effective when the circuit pack is inserted (with the reset that occurs when the MJU is powered up) and there is automatic read every 5 minutes. However, a read can occur whenever the **RESET** button on the circuit pack is operated.

NOTE:
Resetting the DS1-MJU circuit pack will result in service interruption.

Connect 19.2-kb/s Multipoint Circuit (with External MJU Shelf)

1. Check circuit records to see which channels will be connected to the MJU control and branch legs.
   - The DS1-MJU accepts DS0A only. For DS0B application, it needs to be multiplexed to DS0A before connection to DS1-MJU.
   - The 19.2 kb/s DS0A data can be treated as two 9.6 kb/s customers located at channels 2 and 3.
   - Other MJUs can be cascaded with the DS1-MJU.
2. See Table 2-4 for the channel assignment in the DS1 signal going to the MJU circuit pack. The MJU circuits are configured by using DS0 cross-connect commands to access the MJU control leg and branches.

   NOTE:
   Each MJU circuit pack connects to the DACS II by a DS1 line and contains the circuitry for four MJUs; these MJU circuits are accessed by the channel assignment in the DS1 signal. Up to 12 MJU circuit packs (for 12 DS1s) can be mounted on an MJU shelf.

Table 2-4. External MJU Channel Assignment

Channel	MJU Function	Channel	MJU Function
1	MJU 1 Control Leg	13	MJU 3 Control leg
2	MJU 1 Branch 1	14	MJU 3 Branch 1
3	MJU 1 Branch 2	15	MJU 3 Branch 2
4	MJU 1 Branch 3	16	MJU 3 Branch 3
5	MJU 1 Branch 4	17	MJU 3 Branch 4
6	Unused	18	Unused
7	MJU 2 Control Leg	19	MJU 4 Control leg
8	MJU 2 Branch 1	20	MJU 4 Branch 1
9	MJU 2 Branch 2	21	MJU 4 Branch 2
10	MJU 2 Branch 3	22	MJU 4 Branch 3
11	MJU 2 Branch 4	23	MJU 4 Branch 4
12	Unused	24	T1DM Framing

3. Which type 19.2-kb/s signals are being connected to the MJU shelf?

NOTE:
With a DS0A signal on the channel, the channel is connected to the channels in the DS1 going to the MJU circuit pack using either TCON (for PDS) or CONN-CRS-T0 (for MML) commands. With DS0B signals multiplexed on the channel, the channel from the customer facility and the channels from the MJU circuit pack must be established to the DACS II Digital Signal Processing Unit (DSPU). Once established, the subrate customer signals are cross-connected using either SCON (for PDS) or CONN-CRS-TS (for MML) commands.

- If DS0A (single customer), continue with Step **4**.
- If DS0B (multiple customers), proceed to Step **6**.

DS0A Customer Signal (Continue Here)

4. Enter the appropriate commands to connect facility channels to the appropriate channels going to the MJU circuit pack. See Table 2-4 for MJU channel assignments.

   Normal Connection (for MML):

   ```
   CONN-CRS-T0:[xy]:<npc No.>-ddd,<npc No.2>-jjj:[ww]:
   <tc>:RDLD;
   ```

   Terminated Connection (for MML):

   ```
   CONN-CRS-T0:[xy]:<npc No.>-ddd,<npc No.2>-jjj:[ww]:
   <tc>:RDLD[::TERM,TERM];
   ```

Normal Connection (for PDS):

```
TCON:[FRM xy,SEQ ww]:FROM <npc No.1>ddd,
TO <npc No.2>jjj,<tc>,RDC!
```

Terminated Connection (for PDS):

```
TCNT:[FRM xy,SEQ ww]:FROM <npc No.1>ddd,
TO <npc No.2>jjj,<tc>,RDC!
```

⇒ NOTE:
The terminated connection sends an unassigned multiplexer code (UMC) toward the facilities for testing or to hold the circuit in a preservice condition.

Where:

xy = (For MML) Unique id (target id); up to 20 characters.
ww = (For MML) Command correlation tag; up to 10 characters.

xy = (For PDS) DACS II frame number (00 through ZZ). If the command is issued to a remote frame, the frame number is required.
ww = (For PDS) Command sequence number (00 through 49). If the command is issued to a remote frame, the sequence number is required.

<npc No.1> = NPC number for FROM side, either extended (for example, [0]001) or hierarchical [for example, 01-1-01 (for MML) or 01101 (for PDS)]. The FROM and TO side assignments serve as references for test access connections.

<npc No.2> = NPC number for TO side. See <npc No.1>.

ddd = Channel number within the FROM digroup.

jjj = Channel number within the TO digroup.

<tc> = Trunk conditioning to be sent on connecting channels if carrier to NPC fails. **TRSP,MUX** recommended.

RDLD = To designate red lined special circuit; normally used for subrate data circuits (for MML).

RDC = Recommended, to designate red special service circuit (for PDS).

- If the command is denied, find the reason for the denial in the output message and perform corrective action to obtain command completion.

5. Check completion message to verify correct entries.

DS0B Customer Signals (Continue Here)

6. Enter the appropriate command to connect the customer signals (established to DSPU) to channels from the MJU (established to DSPU). See Table 2-4 for MJU channel assignment.

Normal Connection (for MML):

```
CONN-CRS-TS:[xy]:<npc No.1>-ddd-ff[&&-mm],<npc No.2>-
jjj-ll[&&-nn]::RATE-96;
```

Terminated Connection (for MML):

```
CONN-CRS-TS:[xy]:<npc No.1>-ddd-ff[&&-mm],<npc No.2>-
jjj-ll[&&-nn]]::RATE-96:TERM,TERM;
```

Normal Connection (for PDS):

```
SCON:FRM xy,SEQ ww:RATE 96[,TPT],FROM <npc No.1>ddd
/ff[-mm],TO <npc No.2>jjj/ll[-nn]!
```

Terminated Connection (for PDS):

```
SCNT:FRM xy,SEQ ww:RATE 96[,TPT],FROM <npc No.1>ddd
/ff[-mm],TO <npc No.2>jjj/ll[-nn]!
```

NOTE:
The terminated connection sends a UMC on the channels for testing or to hold the circuit in a preservice condition.

Where:

xy = (For MML) Unique id (target id); up to 20 characters.
ww = (For MML) Command correlation tag; up to 10 characters.

xy = (For PDS) DACS II frame number (00 through ZZ). If the command is issued to a remote frame, the frame number is required.
ww = (For PDS) Command sequence number (00 through 49). If the command is issued to a remote frame, the sequence number is required,

<npc No.1> = FROM NPC number, either extended (for example, [0]001) or hierarchical [for example, 01-1-01 (for MML) or 01101 (for PDS)].

<npc No.2> = TO NPC number.

TPT = Two-Point (optional). Retained only for DACS/SRDC compatibility.

ddd = FROM channel number within the digroup.

ff = The FROM customer number. For rate=9.6, customer number can be from 1 to 5.

mm = Optional, for last customer number in a continuous range of DS0B customers.

jjj = The TO channel number within the digroup (being addressed by the command).

ll = The TO customer number. For rate=9.6, customer number can be from 1 to 5.

nn = Optional, for last customer number in a continuous range of DS0B customers.

- If the command is denied, find the reason for the SUBRATE denial in the output message and perform corrective action to obtain command completion.

7. Check the completion message to verify correct entries.

Trouble Clearing

3

This chapter contains the procedures for clearing the alarms indicated by the LEDs on the 19.2-kb/s multipoint junction unit (MJU) circuit packs. These alarms are also indicated at the DACS II by carrier group alarm (CGA) messages. Figure 3-1 shows the MJU shelf which is mounted separate from the DACS II and connected by DS1 lines.

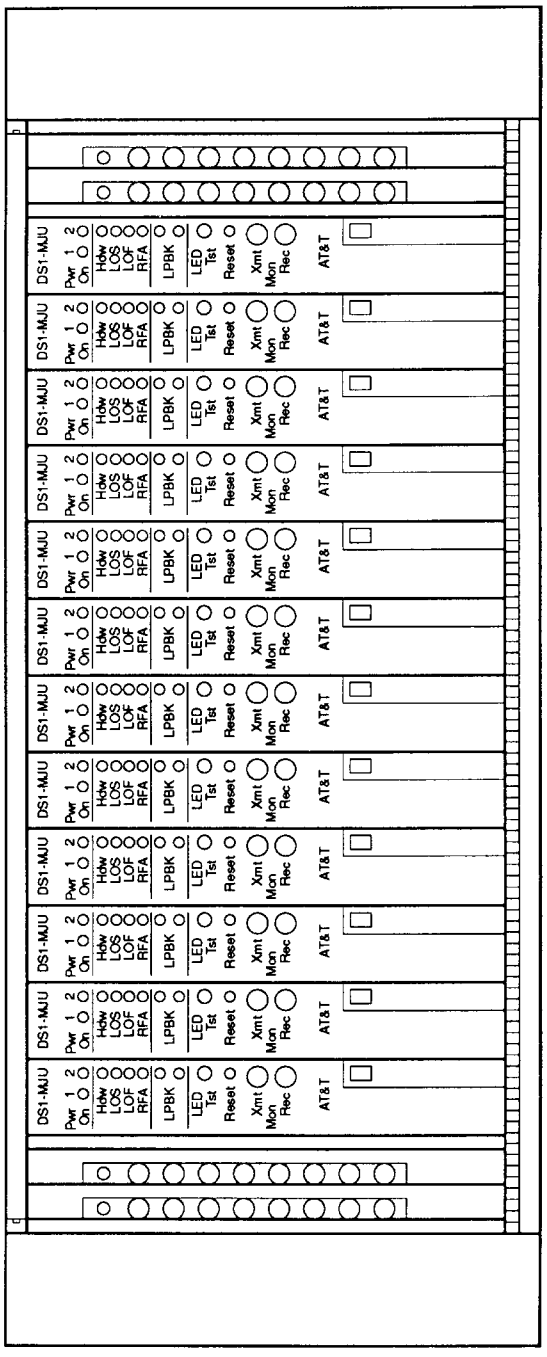

Figure 3-1. 19.2-kb/s Multipoint Junction Unit Shelf

Table 3-1 summarizes the meanings of the indicators on the MJU circuit pack and provide the corrective action.

Table 3-1. MJU Plug-In Alarms

MJU Alarm	DACS II Alarm	Meaning	Corrective Action
Power	CGA R*	Two green LEDs represent stable power source. One LED turned off represents respective fuse is blown. Both LEDs turned off represents both fuses are blown.	(1) Check MJU fuses, (2) Replace MJU.
HDW	CGA R	MJU hardware failure. Flashing light means can't initialize circuits on CP. Steady light means microprocessor failure.	(1) Check MJU fuses, (2) Reset MJU, (3) Replace MJU.
LOS	CGA AIS	Incoming line signal loss detected at MJU.	(1) Operate LPBK on MJU and check DACS II alarms, (2) Replace MJU.
LOF	CGA Y	Incoming loss of DS1 framing detected at MJU.	(1) Check DACS II error messages, (2) Replace MJU.
RFA	CGA R	Remote frame alarm (DACS II detected incoming signal loss and sent RFA to MJU).	(1) Check signal at MJU, (2) Replace MJU.

* For redundancy, each circuit pack is serviced by two fuse packs. If one fuse is blown, only the office alarm system will be affected. If both fuses are blown, a CGA R is detected by the DACS II.

The following considerations apply because special service circuits are involved:

- The 19.2-kb/s MJU plug-ins are used to produce multipoint data circuits. Each MJU plug-in contains the circuitry for four MJUs which can be connected in tandem. Since special service circuits are involved, care must be taken to avoid interrupting service on nonalarmed plug-ins and to clear alarms as quickly as possible.
- Normal customer protocol for special service circuits must be observed including notification to the customer when extended maintenance is required.

Clear MJU HDW Alarm

Overview: This procedure is used to clear the hardware failure alarm at the MJU plug-in. This alarm is reported at the DACS II as CGA type R (red) alarm.

> **NOTE:**
> If data customers on the involved MJU circuits are not aware of the service interruption, you may need to notify them that maintenance is being performed to restore full service capability.

1. Which HDW LED indication do you have?
   - If LED indication is STEADY, then continue with Step **2**.
   - If LED indication is FLASHING, then proceed to Step **3**.
2. Replace the MJU circuit pack.
   - If the HDW LED is not lighted, this procedure is completed.
   - If the HDW LED is lighted, check for bent or broken pins at the circuit pack slot. If no wiring problem is found, contact technical consultant.
3. On the MJU circuit pack with the lighted HDW LED, press the RESET button.

   > **NOTE:**
   > The sequence of indications for a normal reset operation is that all the LEDs except the HDW LED on the circuit pack will flash on and then go off after the reset completes.

   - If the HDW LED goes off and stays off, this procedure is completed.
   - Replace the MJU circuit pack.
     - — If the HDW LED is not lighted, this procedure is completed.
     - — If the HDW LED is lighted again and stays on, replace the MJU circuit pack.
     - — If the HDW LED is lighted, check for bent or broken pins at the circuit pack slot. If no wiring problem is found, contact technical consultant.

Clear MJU LOS Alarm

Overview: This procedure is used to clear the loss of signal alarm at the MJU plug-in. This alarm is reported at the DACS II as CGA type alarm indication signal (AIS) alarm.

> NOTE:
> If data customers on the involved MJU circuits are not aware of the service interruption, you may need to notify them that maintenance is being performed to restore full service capability.

> NOTE:
> A CGA type AIS will not generate a Major alarm in DACS II Release 4.0 or earlier. For Release 4.1 or later, it must be programmed.

1. On the MJU circuit pack with the lighted LOS indicator, press the LPBK button. Pressing the LPBK button will extinguish all alarm LEDs.

   > NOTE:
   > The MJU circuit pack has a LPBK button to loop the signal toward the DACS II for testing by the DACS II and has jacks for monitoring the DS1 signals to the MJU.

2. Which alarm situation occurs at the DACS II?

   > NOTE:
   > CGA alarm messages may occur at the DACS II because of the hit caused by the loopback, but if the transmission path is complete, the alarms will be idled after the framing is restored.

   - If the CGA type changes from AIS to steady R, proceed to Step **4**.
   - If the CGA changes from AIS to no alarm (all idled), continue with Step **3**.

3. Replace the MJU circuit pack that had the lighted LOS indicator. Do not operate the loopback on the replacement.
   - If the LOS indicator is not lighted, this procedure is completed.
   - If the LOS indicator is lighted, check for bent or broken pins at the circuit pack position. If no wiring problem is found, contact technical consultant.

4. At either the DSX-1 bay or the REC jack on the DS1-MJU circuit pack, find the jack set associated with the NPC that connects to the MJU circuit pack. Use test set such as HP3787B to test for pulses without errors at

the MON jack for the transmit line (from DACS II).

- If pulses without errors are detected, the trouble is in the DSX-1 jacks or cabling to the MJU circuit pack.
- If no pulses or pulses with errors are detected, continue with Step **5**.

5. See CAUTION. When the other NPC on the affected DACS II DDC circuit pack can be removed from service, enter the command(s) to remove both NPCs from service as follows:
   `RMV-EQPT::NPC-<npc No.>::[:INCL];` (for MML) or

   `RMV::NPC <npc No.>[,INCL]!` (for PDS)

   Where: <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical [for example, 01-1-01 (for MML) or 01101 (for PDS)].
   INCL = Optional, to enable the removal of NPC which is designated as carrying special service circuits.

   CAUTION:
   When an NPC is removed, service is interrupted on all the cross-connected circuits of that NPC. Contact special service customers and replace plug-in and enter restore command quickly.

   NOTE:
   NPC hardware contains dual digroup cards. Replacing circuit packs may affect other digroups in use.

6. Replace the same NPC.
7. Enter command(s) to restore the same NPCs to service:

   `RST-EQPT::NPC-<npc No.>;` (for MML) or

   `RST::NPC <npc No.>!` (for PDS)

8. After the restore command completes, check the LOS indicator on the MJU circuit pack.
   - If the LOS indicator is lighted, the trouble is in the wiring between the NPC and the DSX-1 jack set for the DACS II.
   - If the LOS indicator is not lighted, this procedure is completed.

Clear MJU LOF Alarm

Overview: This procedure is used to clear the loss of DS1 framing alarm at the MJU circuit pack. This alarm is reported to the DACS II as a CGA type Y (yellow) alarm. The framing bits are derived from the received DS1 signal at the MJU. Consequently, the LOF is caused by either the transmitter, cable, or receiver at the MJU.

> **NOTE:**
> If data customers on the involved MJU circuits are not aware of the service interruption, you may need to notify them that maintenance is being performed to restore full service capability.

> **NOTE:**
> LOF is usually caused by provisioning. The DS1-MJU must be programmed as T1DM,B8ZS or T1DM,AMI.

1. Verify that the DACS II NPCs are configured for the correct format (i.e., T1DM,B8ZS for TYPE=420). Issue the following command:

   `RTRV-STATE-EQPT::NPC-<npc No.>;` (for MML) or

   `UTL::QRY,STATE,NPC <npc No.>!` (for PDS)

   Where:<npc No.>= NPC number, either extended (for example,[0]001) or heirarchical [for example, 01-1-01 (for MML) or 01101 (for PDS)].

   - If error counts at or near the thresholds listed for the parameter in the STATE message are received, refer to Chapter 3 in Volume II of the *DACS II Operation and Maintenance Manual* (365-352-001) to clear the DS1 facility errors.

2. Loop back the DS1-MJU and check the line status at the DACS II.
   - If the alarm clears, proceed to step 4.
   - If the alarm does not clear, the problem is either with the DACS II or the connecting cable.

3. Replace the MJU circuit pack and check for bent or broken pins in the circuit pack slot.
   - If the alarm does not clear after replacing the MJU circuit pack, contact your next level of technical support.

Clear MJU RFA Alarm

Overview: This procedure is used to clear the remote frame alarm at the MJU circuit pack. This alarm is sent from the DACS II when it has an incoming signal failure to indicate to the technician at the MJU that the MJU transmitter may have failed.

> NOTE:
> If data customers on the involved MJU circuits are not aware of the service interruption, you may need to notify them that maintenance is being performed to restore full service capability.

1. At the MJU circuit pack, use test set such as HP3787B to test for pulses without errors at the MON jack for the transmit line (from MJU).
   - If pulses without errors are detected, the trouble is in the DSX-1 jacks or cabling to the DACS II.
   - If no pulses or pulses with errors are detected, continue with Step **2**.
2. Replace the DS1 MJU circuit pack that has the lighted RFA indicator.
   - If the RFA indicator is lighted, check for bent or broken pins at the circuit pack position. If no wiring problem is found, contact technical consultant.
   - If the RFA indicator is not lighted, this procedure is completed.

Clear Blown Fuse on MJU Fuse Panel or Fuse Board

> NOTE:
> If data customers on the involved MJU circuits are not aware of the service interruption, you may need to notify them that maintenance is being performed to restore full service capability.

> NOTE:
> The fuse boards on each MJU shelf distribute the power to up to 12 MJU circuit packs, each of which receives an input from two 48-volt feeders. Each MJU circuit pack has OR'ing diodes for the two power inputs and contains converter circuits to produce the lower voltages required for the plug-in circuits. Two "PWR ON" LEDs on each of the DS1-MJU circuit packs are lighted when redundant power is present on the pack. A blown fuse or loss of power is indicated by the extinguishing of one or both indicators.

1. Locate the fuse(s) that are blown first by the lamp indication, either on the top-bay fuse panel or on the shelf fuse board(s), and by the extended color bead at the center of the fuse.
2. Replace the fuses that are blown.
   - If the fuses hold, the trouble was due to aging fuses. This procedure is completed.
3. If the fuses do not hold, which fuses have blown again?
   - If on the top-bay panel (see Note), continue with Step **4**.
   - If on the shelf fuse board, proceed to Step **5**.

> **NOTE:**
> The 48-volt power from four feeders is distributed to the four fuse boards (two on each side) on the MJU shelf (through top-bay fuse panel if more than one MJU shelf is installed).

4. Replace the fuses that are blown on the top-bay panel.
   - If the fuses hold, the trouble was due to fuse aging. This procedure is completed.
   - If the fuses do not hold, the trouble is in the wiring between the fuse panel and the fuse boards which it supplies.

Table 3-2 shows the 48 volt power distribution.

Table 3-2. 48 Volt Power Distribution

Fuse Designation	NE00623-70 FB Ckt		Backplane Term (–48v/–48RTN)
	G1	G2	
A1 Thru A6	Ckt 1-6 Left Side		E1/E5
B1 Thru B6		Ckt 7-12 Left Side	E2/E6
C1 Thru C6	Ckt 1-6 Right Side		E3/E7
D1 Thru D6		Ckt 7-12 Right Side	E4/E8

NOTE:
The fuse designation will be the same for all six shelves.

5. Determine which MJU circuit pack is supplied by the blown fuses as follows:
   - — The connecting MJU circuit pack will have the HDW LED lighted.
   - — The four shelf fuse boards are wired as shown in Table 3-2.
6. Replace the same MJU circuit pack.
7. Replace the blown fuses.
   - If the fuses hold, this procedure is completed.
   - If the fuses do not hold, check for bent pins at the circuit pack slot. If no wiring trouble is found, contact technical consultant.

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