J98726AC-2, L2, A ALARM CONTROL UNIT (ACU)
DATA SHEET
D4 CHANNEL BANK

DESCRIPTION

The alarm control unit (ACU) is a common equipment plug-in for the D4 channel bank. It is the primary alarm detection and alarm processing unit for a D4 digroup. Two ACUs (one per digroup) are required for operation in mode 2 or 3. One mounts into the ACU slot of digroup A and the other into the ACU slot of digroup B. One ACU is required for operation in mode 1 (48 channels). For mode 1, the ACU mounts into the ACU slot of digroup A.

When this data sheet is reissued, the reason(s) for reissue will be listed in this paragraph.

The COMCODE and *CLEI** codes assigned to J98726AC-2, L2, A ACU are as follows:

- COMCODE -- 601301591
- *CLEI* -- D4AC00DBAA.

The J98726AC-2, L2, A version of the ACU has a more robust algorithm over earlier versions for detecting yellow alarms. The features of this unit support all standard D4 voice-frequency channel applications, 24-channel nonswitched voiceband applications, and 23-channel applications of digital data in the standard D4 superframe (SF) format.

> ***Note:*** The J98726AC-2, L2, A ACU is recommended for nonswitched voiceband data and high-volume digital data applications. However, it is fully backward compatible with all standard D4 channel bank applications.

The ACU performs the following functions:

- Detects alarm conditions and provides indications on the faceplate (Figure 1)
- Controls local and remote transmission alarms and office alarms
- Controls trunk processing functions on a per digroup basis
- Provides local access to the digroup maintenance features
- Monitors DC power for the bank
- Provides nonvolatile memory for recording carrier group alarms (CGAs).

ACU OPERATIONS

Red and Yellow Alarms Detection

The ACU responds to various types of alarm conditions in accordance with AT&T Technical Publication 43801. Facility and channel bank failure alarms are indicated on the faceplate by lighted red (**AR**) and/or yellow (**AY**) lamps. A red alarm occurs upon loss of incoming digital information, either due to digital line or local bank receive-side failure. The **AR** lamp lights steadily if this condition occurs. A yellow alarm occurs as a result of transmitting line or local bank transmitting-side failure. The yellow alarm is then received as a result of the remote bank having received a red alarm. The **AY** lamp lights steadily if this condition occurs. A simultaneous red and yellow alarm (known as red over yellow alarm) condition occurs when a yellow alarm is followed by a red alarm when the far-end bank is looped after having received a red alarm. This causes both **AR** and **AY** lamps to light steadily. A digital hierarchy failure is indicated by alternate flashing of the **AR** and **AY** lamps.

Trunk Processing

A red or yellow alarm causes the ACU to initiate trunk processing after timing requirements are met. The trunk processing function removes failed trunk(s) from service on a digroup basis and invokes a make-busy state on the trunks. A yellow lamp (**TP**) on the faceplate of the ACU is lighted to indicate that the D4 channel bank is out of service. The lamp is turned off after the alarm is cleared and a delay interval has occurred.

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Alarm Cutoff

The push-button switch (**ACO**) on the faceplate (Figure 1) allows for turning off bank and office alarms except when the alarm is caused by a failed fuse. When the alarms are turned off, a green lamp (**ACO**) on the faceplate lights. If the alarm is caused by a failed fuse, pushing the **ACO** button does not light the **ACO** lamp. The **AR** and **AY** lamps remain lighted until the trouble is cleared.

DC Power Monitoring

The ACU monitors -48 volt office battery leads and the output voltages of the D4 channel bank DC-to-DC converter and performs the following:

- Initiates a red alarm and trunk processing if a loss of -48 volts occurs
- Initiates bank and office alarms and sends relay drive signals to the trunk processing unit (TPU) to remove failed trunks from service.

FEATURES

The ACU control and display (indicators) features are provided through lamps, a toggle switch, a push-button switch, and a pin-jack on the ACU faceplate (Figure 1).

The ACU display features are follows:

- Transmission and DC power alarm indications
- A nonvolatile message register to record the occurrence of CGAs each time the trunks are processed for removal from service
- Maintenance access through the faceplate for exercising and indicating digroup control and alarm status
- A manual push-button switch (**ACO**) to turn off office alarms (except when caused by a fuse failure).

Faceplate Lamps

The ACU faceplate lamps are as follows:

- **AR** -- Red alarm lamp lights due to loss of digital line facility, frame synchronization, or DC power failure or due to a local bank receive-side failure. The lamp turns off when the alarm is cleared.
- **AY** -- Yellow alarm lamp lights due to a far-end terminal failure. This provides remote terminal service status through the digital line facility signal. It does not light on a local bank that is transmitting a yellow alarm to the far-end terminal. The lamp turns off when the alarm is cleared.
- **TP** -- Trunk processing lamp lights when the ACU declares an out-of-service condition and forces the trunks to an out-of-service status as a result of a CGA, fuse failure, or insertion of pin jack into the **FTP** jack. If the **TP MEM** switch is in the **TP MEM** position, the lamp remains lighted after the alarm is cleared until the **TP MEM** switch is reset. The switch is reset by setting it to the **OFF** position and back to the **TP MEM** position. If the switch is in the **OFF** position, the lamp extinguishes when the D4 channel bank recovers from the alarm condition.
- **ACO** -- Alarm cutoff lamp lights when the **ACO** button is activated (pushed) after an alarm condition has occurred. It automatically extinguishes when the alarm is cleared.
- **LT** -- Loop terminal lamp lights when the transmitted output of the D4 channel bank is looped to the received input.
- **LL** -- Loop line lamp lights when a yellow alarm is being transmitted while the digital line facility is being tested.

Faceplate Switches

The ACU faceplate switches are as follows:

- **ACO** -- Alarm cutoff switch is enabled only after a CGA has been declared in the associated digroup. When the **ACO** switch is activated, it extinguishes office audio-visual alarms and the **ALM** lamp on the power distribution unit (PDU) plug-in. Activation of the switch also enables the **LL LT NORM** switch functions of the ACU.
- **TP MEM** -- The trunk processing memory switch enables a latching capability of the **TP** status lamp. With the switch in the **MEM** position, the lamp is latched in the ON state, if the digroup enters the trunk processing state. The memory function is reset (lamp not lighted) by setting the **TP MEM** switch to the

OFF position and back to the **MEM** position. With the **TP MEM** switch in the **OFF** position, the **TP** lamp turns ON and OFF in accordance with the current digroup trunk processing state. Note that this feature is used to indicate one or more CGA events over a specified time period and is typically used to locate and identify system failure.

- **LL LT NORM** -- The loop line, loop terminal, and normal switch is enabled only after the digroup has been trunk processed and the **ACO** switch has been activated. The **LL** position functions to allow for the simultaneous transmission and reception of the digroup's yellow alarm. It maintains a trunk-processed state while using sectionalization techniques (line loopbacks) to locate line faults. The **LT** position functions to loop the digroup transmit signal back to the receive circuits to verify terminal operation at the near-end. While in this position (LT mode), an all ones signal is transmitted to the far-end. The **NORM** position is the in-service position and allows alarm declaration and recovery.

Pin Jack

The force trunk processing (**FTP**) pin jack allows for trunks to be placed out of service without the presence of an alarm. The **TP** lamp lights when the pin plug is inserted.

CGA Message Register

The message register provides a nonvolatile record of the number of CGAs that have occurred over a period of time. The register can be reset by pushing the button located below and to the left of the mechanical numeric registers.

MAINTENANCE

The **LL LT NORM** toggle switch on the faceplate (Figure 1) is provided to aid in locating trouble. It is functional only after trunk processing has occurred (normally as a result of an AR or AY alarm) and the **ACO** switch has been activated.

REFERENCES

The following publications contain description, engineering, and maintenance information on the D4 channel bank and related circuit packs:

PRACTICE	TITLE
365-170-000	D4 Channel Bank - (TOP)
365-170-100	D4 Channel Bank - Description
365-170-101	D4 Channel Bank - General Channel Unit Description
801-505-155	D4 Channel Bank Equipment - for Use With Digital Transmission Systems - Equipment Design Requirements - Common Systems
855-351-103	D1, D2, D3, and D4 Digital Channel Banks and D5 Digital Terminal System - Application Engineering - Carrier Engineering
855-351-105	D4 Channel Bank - Channel Units - Application Engineering.

DRAWING	TITLE
SD-3C304-02	D4 Channel Bank - Application Schematic

PRECAUTIONS

The **ACU** unit contains devices that are subject to damage or decreased reliability from static discharges. When handling either unit, proper antistatic measures should be taken, such as wearing grounding bracelets and handling by the faceplate only.

REGIONAL TECHNICAL ASSISTANCE

Technical assistance for the D4 channel bank can be obtained by calling the Regional Technical Assistance Center at **1-800-225-RTAC**. This telephone number is staffed 24 hours per day.

WARRANTY

The terms and conditions of sale will include a five year warranty.

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Published by
The AT&T Document Development Organization

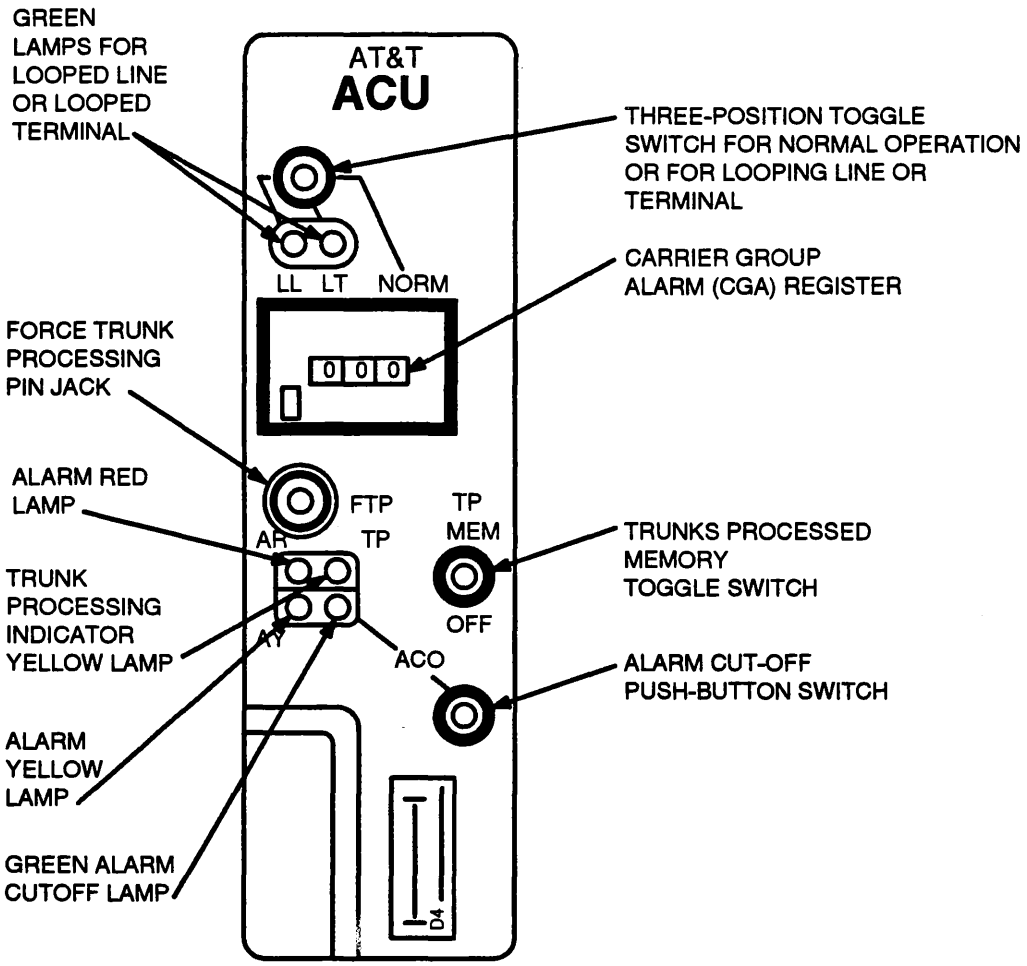

Figure 1—J98726AC-2, L2, A Alarm Control Unit Faceplate