0 - Not acknowledgement.

2.Format of the messages

The messages which will be sent over the 50 baud maintenance channel shall have the following structure:

$C_1C_2M_1M_2....M_n$;

C_1C_2: Message category (two characters);

M_1-M_n: Information (number of characters unlimited).

After the reception of a message at the receiving end, the receiving end shall send one character to the originating end as an acknowledgement of the reception.

2.1Message categories

The purpose of the message categories (called MC) is to give a direct command or to inform the control equipment in an exchange, a maintenance centre or a TDM about what type of information the following message contains.

The MC consist of two characters, and each character is a decimal number from 0 to 9. The numbers are coded according to alternative A (CSC) in R.115.

2.2Information

The information characters are a part of an order to the remote TDM equipment or information from the remote TDM-equipment, depending on the Message Category Signal.

The number of information characters in a message is not limited.

The characters are decimal numbers from 0 to 9, coded according to alternative A(CSC) in R.115.

3.Maintenance messages

Using the format described in § 2 the maintenance messages shall have a message category and information as given in the table below:

TABLE 1

Maintenance messages

It shall be possible to reset all alarms from the local side. The command shall also be able to reset the error rate value.

1.5System alarms

Failures that affect operation of the whole or a major part of the TDM equipment are classified as one category. The supervised functions are:

-Carrier: Loss of carrier is detected by the data modem through CCITT circuit 109 or the corresponding circuit.

-Synchronization: Loss of synchronization is detected by the TDM multiplexer in accordance with the respective CCITT Recommendation.

-Multiplexing logic: Failure of the TDM central logic is detected by internal supervision facilties within the multiplexer.

-Power: Failure of the power supply is detected when the telegraph power supply exceeds tolerance limits.

1.6Changing of active side

When the TDM equipment is duplicated the active side can be changed by command or manually.

When the remote or local side is changed automatically or manually, information about what side is executive must be sent when the change has been executed.

1.7Looptest on standby side

When the TDM equipment is duplicated the standby modem can be tested by the setting of loop b by command. The test result is sent over the active maintenance channel.

1.8Automatic restart

When the remote TDM is automatically restarted, information shall be sent informing about the restart and alarm status.

1.9Acknowledgement

The acknowledgement consists of one character and should have the following values:

5 - Acknowledgement;

Recommendation R.116 (R.11m)

MAINTENANCE TESTS TO BE CARRIED OUT ON INTERNATIONAL TDM SYSTEMS

The CCITT,

considering

a) the savings to be made by reducing interruption time on TDM links;

b) the importance of being able to determine responsibilities between the several parties who, of necessity are involved in maintenance questions for the networks;

c) the advantages of standardization regarding maintenance;

d) maintenance loops are standardized in Recommendation R.115,

unanimously declares the following:

that when the quality of the TDM-link has deteriorated beyond the alarm limit or if the local muldex gives an alarm, supplementary measurement should be performed. The following test and supervision methods can be used.

1. Testing and supervision of TDM systems

1.1 Bit error rate

The synchronization bits are supervised and an error rate alarm is issued when the error rate exceeds a preset limit, 10^{-3}, 10^{-4} or 10^{-5}.

1.2 Bit error counter

All synchronization bit errors shall be registered in a cyclic counter and it shall be possible to read the value of this counter by command.

1.3 Routine supervision

The operation of the TDM equipment and maintenance channel should continuously be supervised by a repetitive test signal. An alarm is issued when a correct acknowledgement is not received for a specified number of test signals. The alarm is reset automatically when the fault situation ceases.

1.4 Alarm reset