

DIGITAL TRANSMISSION SYSTEMS
J98718BR D3 CHANNEL TEST UNIT CIRCUIT
SIGNALING AND TRANSMISSION
DESCRIPTION

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1. GENERAL

1.01 This section describes the J98718BR signaling and transmission test unit (Fig. 1) which can be plugged into any channel unit slot of the D3 channel bank to test the common signaling circuits. Detailed circuit information is contained in SD-3C140-01 and CD-3C140-01.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 The J98718BR signaling test unit can be used to test common signaling circuits on a looped basis or end-to-end. The D3 channel bank can be looped for signaling tests using the LT switch. For end-to-end tests between two D3 banks, J98718BR units would be used; but for tests between a D3 and a D1D bank, the D1 signaling test unit (J98711AG) is required at the D1D end. The unit also has XMT and RCV jacks for transmission tests toward the line side of a channel.

2. DESCRIPTION

2.01 The signaling test unit consists basically of three sections: the signaling transmitter,

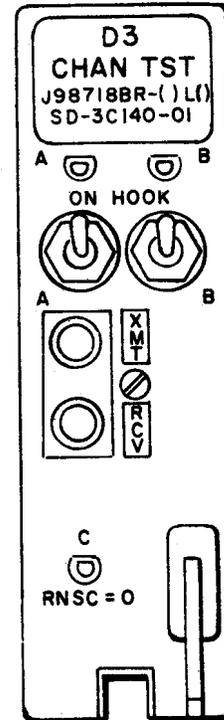


Fig. 1—D3 Signaling and Transmission Test Unit

the signaling receiver, and the transmission test sections. A block diagram of the unit is shown in Fig. 2.

A. Signaling Transmitter Section

2.02 The signaling transmitter section contains the control logic and signaling circuitry to transmit on-hook and off-hook signaling information on the A and B common signaling buses. Two faceplate-mounted toggle switches, designated A

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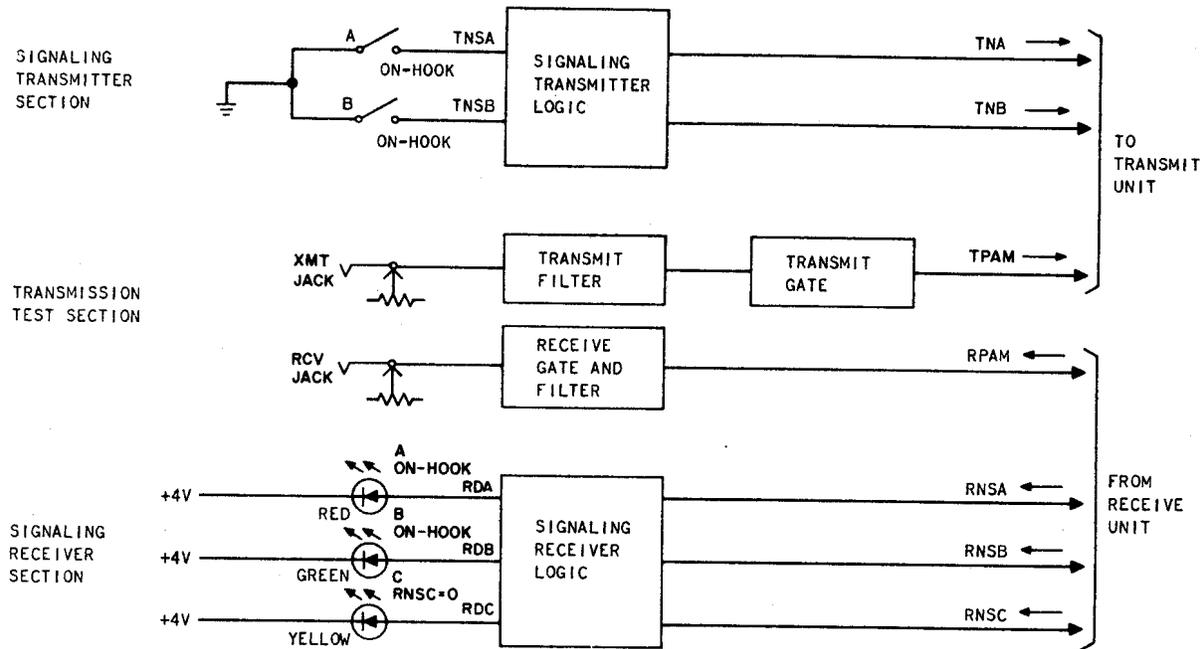


Fig. 2—Block Diagram of Signaling and Transmission Test Unit

and B, are used to manually force an on-hook or off-hook condition on the signaling buses.

2.03 Setting the A switch to the ON-HOOK position grounds the TNSA lead, forcing a logic 0 condition on the lead. The logic 0 is transmitted, through the signaling transmitter logic, to the TNA lead. The TNA lead is connected to the transmit unit in the channel bank which sends the on-hook signal to the far-end channel bank, or if the bank is looped, to the receive unit of the bank. Setting the A switch to the down (off-hook) position removes the ground from the TNSA lead, forcing a logic 1 condition on the lead. The off-hook signal is transmitted in the same manner as the on-hook signal described above. Switch B operates in an identical manner to switch A.

B. Signaling Receiver Section

2.04 The signaling receiver section contains the control logic and signaling circuitry necessary to receive the on-hook and off-hook signaling information from the A and B common signaling buses. Faceplate-mounted light emitting diodes (LED) provide visual indications of the on-hook or off-hook condition of the A or B buses in the signaling receiver section.

2.05 The on-hook condition for the A signaling bus is received from the channel bank receive unit as a logic 0 on the RNSA lead. The logic 0 is fed to the signaling receiver logic where it is converted to a logic 1 condition. This logic 1 is sent via the RDA lead to the red LED which is designated A/ON-HOOK. The logic 1 condition lights the A/ON-HOOK LED indicating a received on-hook signaling condition. If a logic 1 (off-hook) is received on the RNSA lead, the A/ON-HOOK LED is extinguished by the logic 0 condition from the signaling receiver logic.

2.06 The B signaling bus indications are accomplished in an identical manner except the leads are RNSB and RDB and the B/ON-HOOK LED is green.

2.07 The ON-HOOK label is used for the LED (on) and the switch (up) designations rather than a LOGIC 0 label, to avoid ambiguity in working with a D1D bank at the far end. The D1D and D3 logic conventions do not match, but the dc drop-side signaling conditions (on-hook or off-hook) match. In most cases, this ON-HOOK label may be applied literally for the A signaling path. Interpretation is required for the B path, depending on the type of service assigned to the channel.

Interpretation is required also for the A path when FX channel units are assigned. Table A provides the required interpretation.

2.08 The yellow LED, designated C/RNSC=0 on the signaling test unit, is only for checking the RNSC signal from the receive common circuits. There is no corresponding switch in the signaling transmitter section. (The RNSC signal is used only for RPT channel units.) The C/RNSC=0 LED is lighted when a logic 1 condition is on the RDC lead and indicates a logic 0 on the RNSC lead. The C/RNSC=0 LED should be lighted when either the A or B LED is lighted or when both are lighted.

2.09 Table B shows the relationship between the switch positions and the visual indicators on the signaling test unit when testing a looped bank.

C. Transmission Test Section

2.10 The transmit path of the transmission test section provides an unbalanced 600-ohm

impedance jack access, XMT, at a -7.5 dB transmission level point (TLP), toward the line side of the channel bank. Thus, the test unit may be used for transmission tests just as any type of channel unit, except that there is no drop access. The transmitted signal is passed through the transmit filter to the transmit gate. The transmit gate, controlled by the channel unit logic circuits, samples and time multiplexes the signal at an 8-kHz rate and the resultant pulse amplitude modulated (PAM) sample is transmitted via the TPAM bus to the transmit common circuitry.

2.11 In the receive path, the PAM sample is received via the RPAM bus and is passed through the receive gate and filter circuits. The gate is controlled by the receive logic circuits and the output of the receive filter is representative of the input to the transmit jack at the far end of the system. The receive jack (RCV) provides an unbalanced, 600-ohm impedance, jack access at $+2.5$ dB TLP, from the line side of the channel bank.

TABLE A

The term "on-hook" should be understood to mean the following:

SIG. PATH	CHAN SIGNALING	DIRECTION	MEANING OF "ON-HOOK"
A	DP, RP, E&M	Either	On-hook
A	FX	Toward office	Open-loop
A	FX	Toward station	Tip ground
B	RP	Toward terminating end	See Note 1
B	RP	Toward originating end	Revertive pulse present
B	DP, E&M	Either	See Note 2
B	FX	Toward office	Ring ground
B	FX	Toward station	20-Hz ringing

Note 1: B is slaved to A.

Note 2: B is slaved to A at transmit end, but B is not used at receiving end.

TABLE B (NOTE 1)

SWITCH POSITIONS		INDICATORS		
A	B	RED	GREEN	YELLOW
On-Hook	On-Hook	On	On	On
On-Hook	Off-Hook (Note 2)	On	Off	On
Off-Hook	On-Hook	Off	On	On
Off-Hook	Off-Hook	Off	Off	Off

Note 1: This table applies to a test unit plugged into a looped bank. For end-to-end tests, the indicator conditions on one test unit correspond to the switch positions on the far end unit.

Note 2: Off-hook is not stamped on the faceplate of the unit but it corresponds to the down position of the switches and the off-hook condition of the indicators.