



LYNCH COMMUNICATION SYSTEMS INC. (NEV.)

204 Edison Way, Reno, Nevada 89520 • Area Code 702 786-4020

FACTORY SERVICE INSTRUCTIONS

Equipment returned for repair does not require Return Authorization numbers. Equipment returned for Credit must be accompanied by a Return Authorization number which must be obtained from our Marketing Administration Department.

Return all Lynch equipment for Repair or Credit to:

LYNCH COMMUNICATION SYSTEMS INC.
REPAIR SERVICES DEPARTMENT
204 EDISON WAY
RENO, NEVADA 89520
(702) 786-4020

Attach a Return Authorization tag to returned equipment whenever possible, giving a brief description of the problem. These tags are available from your Lynch Sales Engineers or the Repair Service Department.

REPAIR SERVICE

In Warranty — Repairs will be made and the equipment returned at no charge. A purchase order is not required but may be enclosed if record keeping is desired.

Out of Warranty — Repairs made to equipment after warranty expiration are billable transactions and, if possible, should be accompanied by a purchase order. Billing, per transaction will include labor (one hour minimum) plus materials and freight charges.

EXPEDITE SERVICE

Upon request, Expedite Repair Service is available on a 24-72 hour turnaround basis, for emergency and out-of-service conditions only. Please contact the Lynch Repair Services Department for information and instructions before returning the defective equipment. There will be an additional handling charge for this service.

Please ship the defective equipment to Lynch prepaid, in accordance with the above instructions. Lynch will endeavor to return the repaired equipment in ten working days or less. Repairs will be billed in accordance with Lynch's most current price list. All repaired equipment will be warranted for 90 days.

REPLACEMENT SERVICE

Replacements are available for emergency or out-of-service conditions. Arrangements can be made by calling our Marketing Administration Department in Reno (Phone: (702) 786-4020).

SPECIAL PACKAGING INSTRUCTIONS

Lynch equipment modules (plug-in units) containing CMOS devices are packaged for shipment in special anti-static bags. These units should always be returned in the anti-static shipping bags to prevent additional damage from static discharge. A general equipment handling procedure for these units is included on the following page.

Waymon Wells
Manager, Repair Services
Lynch Communication Systems Inc.

WARNING: Equipment plug-in units containing CMOS devices are packaged in anti-static bags. The CMOS devices are susceptible to static discharge damage in the unconnected circuit condition. The following procedure should always be followed when installing or replacing these plug-in units:

- (1) Momentarily touch grounded equipment rack or housing to remove any body charge. Exposed metal surface or mounting hardware provides the best ground.***
- (2) Momentarily ground anti-static bag before removing plug-in unit for inspection or installation.***
- (3) Avoid touching circuit traces or components of plug-in units during installation or removal. Handle plug-in units at front and side edges only.***
- (4) Momentarily ground anti-static bag before inserting plug-in unit for storage or shipment.***



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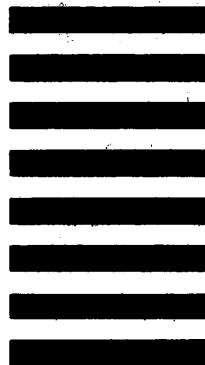
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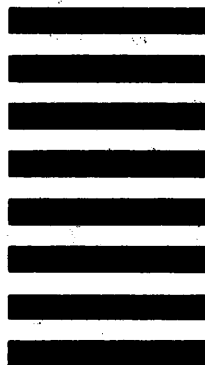
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B325 TERMINAL
(D3, D4 TYPE CHANNEL BANK)
TECHNICAL MANUAL

Printed: November 1977
Reprinted: April 1979
Reprinted: September 1979
Reprinted: April 1981

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B325 TECHNICAL MANUAL ADDENDUM

1. GENERAL

1.001 This addendum adds supplementary data to the B325 Technical Manual dated November 1977. Channel signaling distortion, tracking, and signal-to-distortion specifications are herein added to Table A in Section II.

1.002 The contents of this addendum will be added to the B325 Technical Manual at the next manual revision.

2. CHANGES

2.001 Insert this addendum following the Technical Manual title page.

2.002 The following specifications are part of Table A, Section II.

TABLE A (Cont)

B325 TERMINAL SPECIFICATIONS

PARAMETER	PERFORMANCE SPECIFICATION								
CHANNEL CHARACTERISTICS									
Signaling Distortion									
E&M (open/ground)	$\leq 5\%$ from 30% to 70% break between 8 to 12 pulses/sec								
Tracking	<table> <tr> <th>1020 Hz Input Signal Power</th><th>Deviation from Gain At 0 dBm0 Input Signal Power</th></tr> <tr> <td>+3 to -37 dBm0</td><td>0.50 dB Maximum <0.25 dB Average</td></tr> <tr> <td>-37 to -50 dBm0</td><td>1.0 dB Maximum <0.5 dB Average</td></tr> </table>	1020 Hz Input Signal Power	Deviation from Gain At 0 dBm0 Input Signal Power	+3 to -37 dBm0	0.50 dB Maximum <0.25 dB Average	-37 to -50 dBm0	1.0 dB Maximum <0.5 dB Average		
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+3 to -37 dBm0	0.50 dB Maximum <0.25 dB Average								
-37 to -50 dBm0	1.0 dB Maximum <0.5 dB Average								
Signal-To-Distortion	<table> <tr> <th>1020 HZ Input Signal Power</th><th>Signal-to-Distortion, Minimum Values (dB) Measured with C-Message Weighting</th></tr> <tr> <td>0 to -30 dBm0</td><td>33 dB</td></tr> <tr> <td>-40 dBm0</td><td>27 dB</td></tr> <tr> <td>-45 dBm0</td><td>22 dB</td></tr> </table>	1020 HZ Input Signal Power	Signal-to-Distortion, Minimum Values (dB) Measured with C-Message Weighting	0 to -30 dBm0	33 dB	-40 dBm0	27 dB	-45 dBm0	22 dB
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0 to -30 dBm0	33 dB								
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Contents

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(D3, D4 TYPE CHANNEL BANK)
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SECTION	CONTENTS
I.	INTRODUCTION
II.	SPECIFICATIONS
III.	OPERATION
IV.	COMPONENT DESCRIPTION
V.	INSTALLATION AND CHECKOUT
VI.	PERIODIC ALIGNMENT TEST
VII.	TROUBLESHOOTING
VIII.	ENGINEERING CONSIDERATIONS

SECTION I

INTRODUCTION

CONTENTS	PAGE
1. GENERAL	1
2. PLUG-IN UNITS.....	3
3. CONTROLS AND INDICATORS.....	3
Figures	
1. Lynch B325 Terminal (D3 Version) ...	2
2. Alarm and Power Unit (325AP01) Controls and Indicators.	5
3. Test and Alignment Panel (325TA01) Controls and Test Jacks.	6
Tables	
A. B325 Terminal Plug-In Units.	3

1. GENERAL

1.01 The Lynch B325 channel bank is a technically sophisticated system that extends into the fourth generation (D3/D4) of terminals employing time division multiplexing (TDM) and pulse code modulation (PCM) techniques.

1.02 A B325 terminal operates over a T-1 repeatered line to provide 24 two-way voice channels, plus their associated signaling. Two terminals, with the addition of an optional D4 converter board, provide 48 voice channels over a T1C repeatered line. Toll quality performance makes the B325 terminal suitable for service on all classes of switched telephone trunks and for all special service voice-frequency channel applications.

1.03 The B325 terminal is shown in Fig. 1. Dramatically smaller than most terminals in the D3 field, the B325 occupies only six mounting spaces (10-1/2 inches) in a 19-inch relay rack. It

has few rivals for high-density applications. Not apparent, but equally important, the B325 power dissipation is very low, significantly less than its counterparts, and adds to its attractiveness in high-density installations.

Warning: This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. As temporarily permitted by regulation, it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Note: New FCC Rules concerning radio frequency emissions require insertion of the above warning in instruction manuals for equipment classified as "Class A Computing Devices." The rules apply to equipment manufactured after December 31, 1980, and prior to the time (not later than October 1, 1983) when the equipment is verified as complying with FCC emission standards by specific testing defined by the FCC. The B325 system is a Class A computing device.

1.04 To achieve the size compression and power-dissipation reduction inherent in the B325 terminal, solid-state integrated devices are employed almost exclusively. The innovative design that culminated in this compact, cost-effective and reliable system include:

- (a) Medium-scale integrated (MSI) devices. The capabilities of each device are carefully matched to its intended use within a given cir-

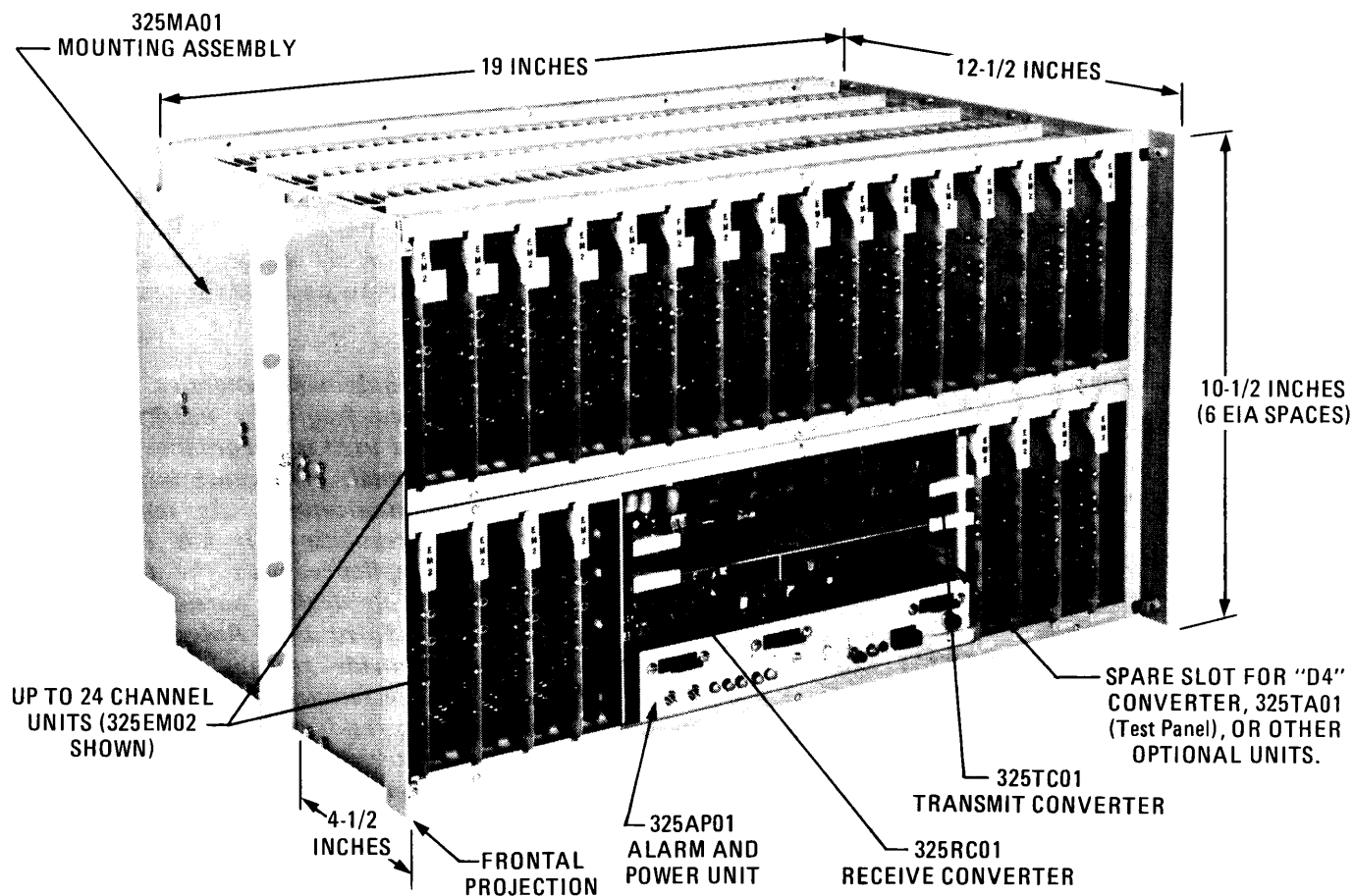


Fig. 1—Lynch B325 Terminal (D3 Version)

cuit to achieve full utilization of the MSI devices, thus substantially reducing the integrated circuit count and increasing the reliability of each unit in the terminal. As a result, the common equipment functions are encompassed in only three PC board units, which significantly reduces spares inventory requirements.

(b) The B325 circuitry is organized so that no multiplex switching busses are required. This is achieved by performing all multiplex operations in the transmit and receive converters, rather than in the channel units. Loss of a single channel (VF or signaling), thus, *does not* "hang up" the terminal and drop all channels. Correction of such a fault is then simple, since only the offending channel needs to be tested or replaced. This is in contrast with the usual bus-oriented banks in which a single failure may cause the testing of many channels to localize the fault.

(c) A unique receive framer reframes in 11 milliseconds or less, which is considerably better than the 50-msec toll specification.

(d) A phase-locked loop circuit allows transmit/receive synchronization for such applications as No. 4 ESS and other electronic offices.

(e) Conversion to D4 is straightforward. A second terminal, along with a single plug-in D4 converter unit, is added to the first terminal. The conversion is accomplished by a few additions to the backplane wiring, thereby interconnecting the two terminals. No external TIC multiplex is needed.

Note: The B325 is fully compatible; end-to-end, with WECO.

1.05 Mechanical and electrical specifications for the B325 terminal are located in Section II, Specifications, of this manual.

2. PLUG-IN UNITS

2.01 The B325 is comprised mainly of channel units and common equipment units. All of the channel units can be of the same type or composed of any combination of E&M, dial pulse, foreign exchange units or VF-only types. The common equipment units consist of: transmit converter (325TC01), receive converter (325RC01), and alarm and power unit (325AP01).

2.02 Table A lists the part number, nomenclature, function and quantity per terminal for B325 terminal plug-in units. The B325 mounting assemblies (shelves) are also included in this table.

3. CONTROLS AND INDICATORS

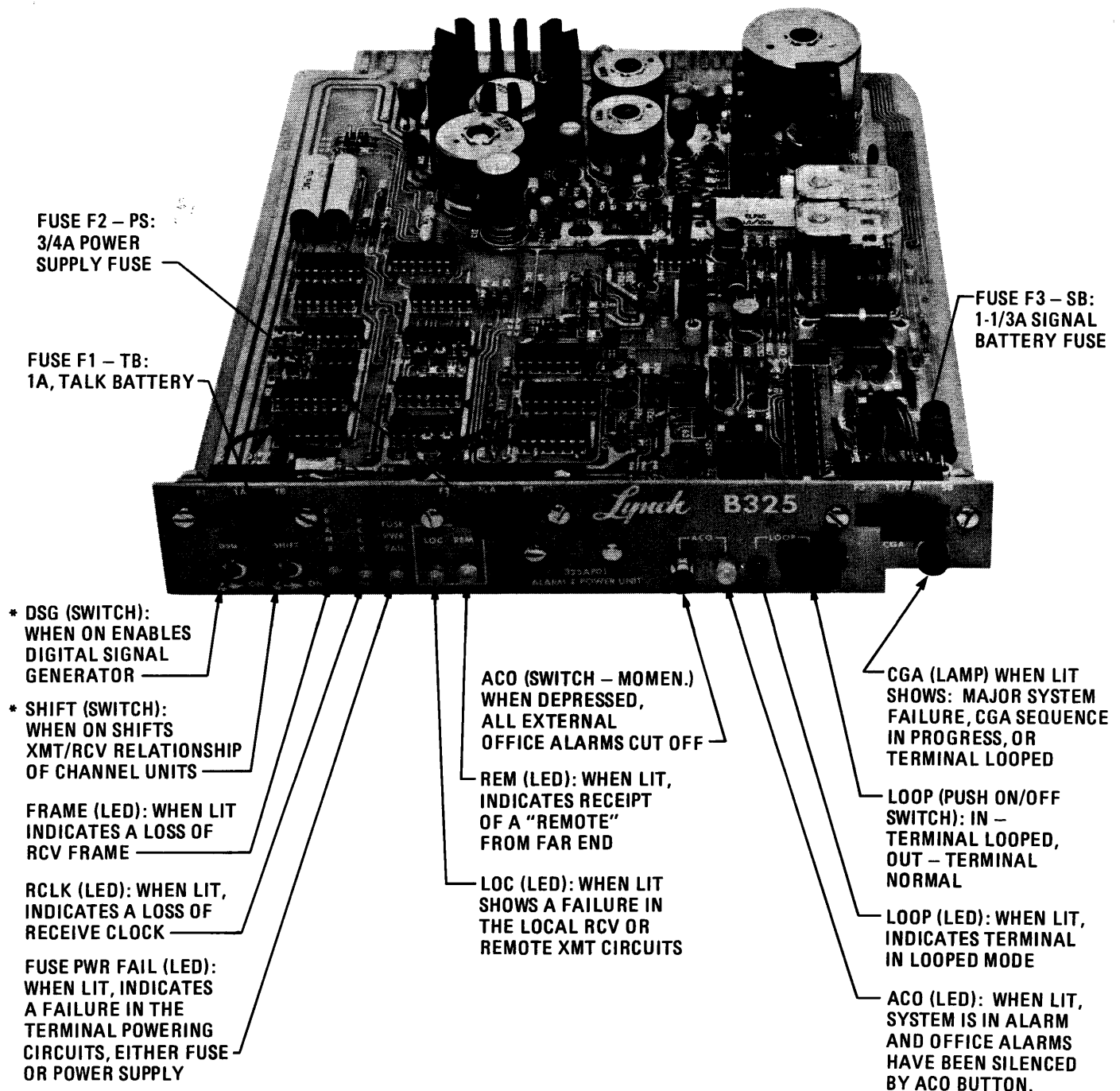
3.01 Figure 2 illustrates and describes panel-mounted controls and indicators on the alarm and power unit. Fig. 3 illustrates controls and test jacks on the test and alignment panel.

TABLE A
B325 TERMINAL PLUG-IN UNITS

PART NUMBER	NOMENCLATURE	FUNCTION	UNITS PER TERMINAL
325RC01	Receive Converter	Provides all receive-direction functions. Includes RCV timing, serial to parallel conversion, D/A conversion and VF demultiplexing.	1
325TA01	Test and Alignment Panel	Provides test and alignment facilities and access jacks for external test equipment.	Can be shared by several terminals.
325TC01	Transmit Converter	Provides all transmit-direction functions, except bipolar conversion. Includes XMT timing, VF multiplexing, A/D conversion and parallel to serial conversion.	1
325AP01	Alarm and Power Unit	Provides -48 Vdc, ± 12 Vdc and +5 Vdc power to the terminal's electronics. Provides terminal fusing. Contains all alarm and CGA circuitry. Also provides bipolar conversion for XMT direction.	1
325DP01	Originating Dial-Pulse Channel Unit	Works end-to-end with terminating dial-pulse channel unit (325DP02), or equivalent. Provides 2-wire to 4-wire conversion, XMT and RCV signaling, reverse battery supervision, and CGA alarm conditioning circuits.	1 to 24
325DP02	Terminating Dial-Pulse Channel Unit	Provides 2-wire to 4-wire conversion with signaling for terminating office functions to match the channel unit (325DP01).	1 to 24

TABLE A (Cont)
B325 TERMINAL PLUG-IN UNITS

PART NUMBER	NOMENCLATURE	FUNCTION	UNITS PER TERMINAL
325EM01	4-Wire, 600-Ohm E & M Channel Unit	Two-way speech and signaling unit. Works end-to-end with any 325EMxx channel unit. Includes amplifiers, filters, XMT and RCV signaling circuits, test points/level controls and circuits for conditioning trunks during alarm conditions (CGA feature).	1 to 24
325EM02	2-Wire, 600-Ohm E & M Channel Unit	Same as 325EM01, except: 2-wire to 4-wire conversion with 600-ohm hybrid. A and B leads are provided as Option 1.	1 to 24
325EM03	2-Wire, 900-Ohm E & M Channel Unit	Same as 325EM02, except: 900-ohm hybrid. A and B leads are provided as Option 1.	1 to 24
325FX01	Originating Foreign-Exchange Channel Unit	Provides 2-wire to 4-wire conversion (station end) with 900-ohm hybrid. Provides loop supervision; opens T & R to stop charges and make-busy during CGA. Also, provides loop- and ground-start operation as a strap option.	1 to 24
325FX02	Terminating Foreign-Exchange Channel Unit	Same as 325FX01, except used at central office.	1 to 24
325MA01	Mounting Assembly	Provides a mounting facility for all terminal plug-in assemblies. Backplane is configured for D3 channel numbering sequence.	1
325VF01	4-Wire VF Channel Unit	Provides 4-wire VF transmit and receive paths, with no signaling provision.	1 to 24



***OPERABLE ONLY IN LOOP MODE.**

Fig. 2—Alarm and Power Unit (325AP01) Controls and Indicators

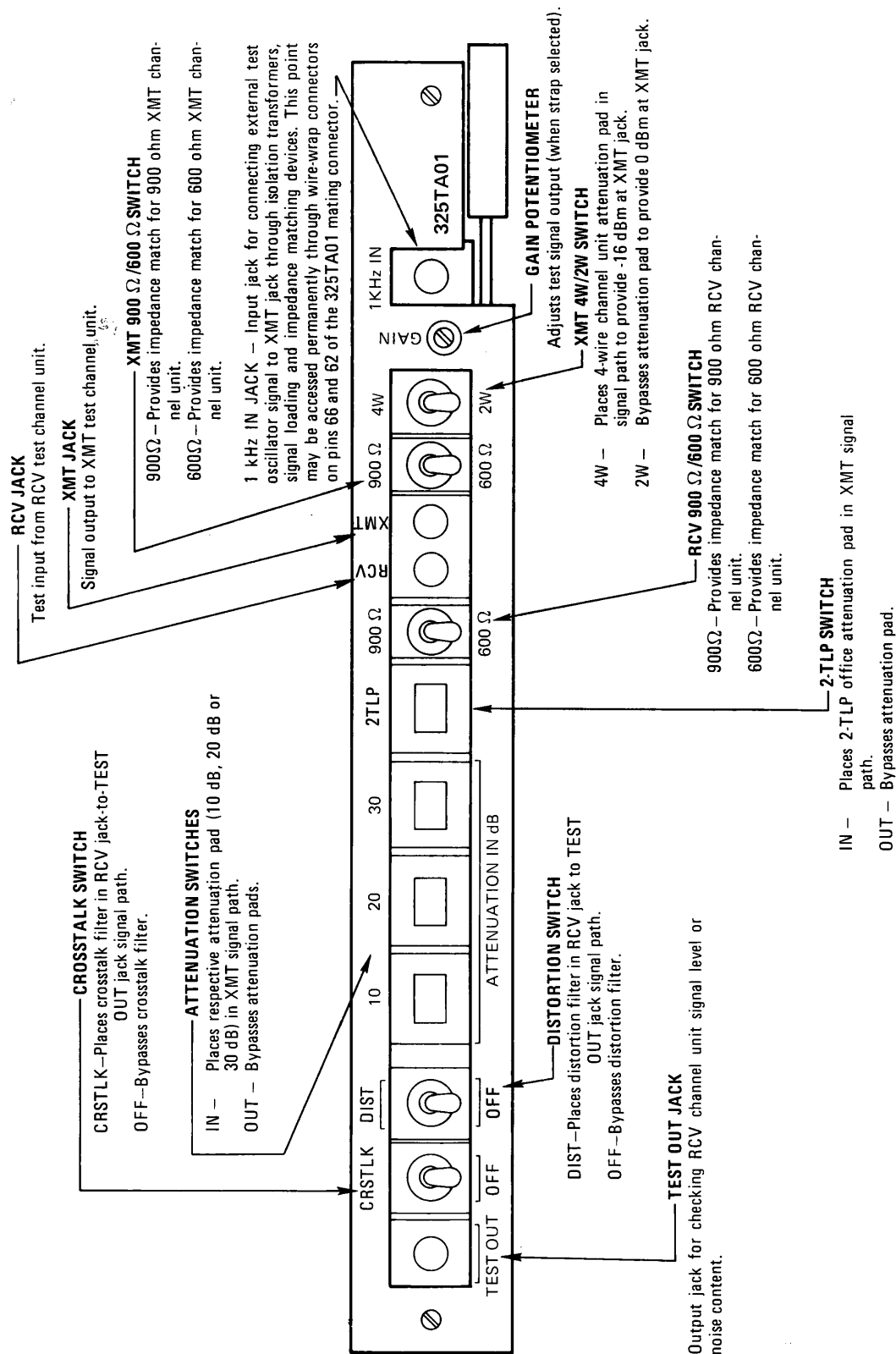


Fig. 3—Test and Alignment Panel (325TA01) Controls and Test Jacks