

M8043

M8043

DLV11-J SERIAL LINE UNIT

Amp		Bus Loads		Cables
+5 V	+12 V	AC	DC	
1.0	0.25	1	1	BC21B-XX BC20N-XX (Refer to DLV11-KA) BC20M-XX

Standard Addresses

Configuration No. 1	Channel 0	Channel 1	Channel 2	Channel 3
RCSR	176500	176510	176520	177560
RBUF	176502	176512	176522	177562
XCSR	176504	176514	176524	177564
XBUF	176506	176516	176526	177566

Configuration No. 2

RCSR	176500	176510	176520	176530
RBUF	176502	176512	176522	176532
XCSR	176504	176514	176524	176534
XBUF	176506	176516	176526	176536

Standard Vectors

Configuration No. 1

Receiver	300	310	320	60
Transmitter	304	314	324	64

Configuration No. 2

Receiver	300	310	320	330
Transmitter	304	314	324	334

Diagnostic Programs

Refer to Appendix A.

NOTE

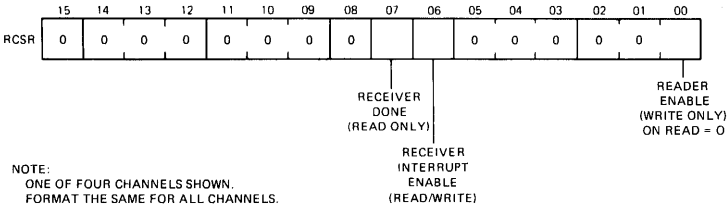
This test requires that four H3270-A loopback plugs be inserted into the DLV11-J module in order for the diagnostic to run.

Related Documentation

DLV11-J User's Guide (EK-DLV1J-UG)

Field Maintenance Print Set (MP00586)

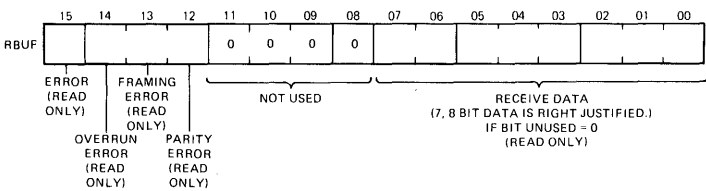
Microcomputer Interfaces Handbook (EB-20175-20)



MR 6115

RCSR Registers Bit Assignments

Word	Bit	Function
RCSR	8-15	Not used. On read = 0.
	7	Receiver Done - Set when an entire character has been received and is ready for input to the processor. This bit is automatically cleared when RBUF is read, when INIT is asserted (on power-up or reset instruction), or when reader enable bit is set. Read only. If receiver interrupt enable (bit 6) is set, the setting of receiver done starts an interrupt sequence.
	6	Receive Interrupt Enable - Set under program control when it is desired to allow a receiver interrupt sequence to occur when a character is ready for input to the processor (signified by receiver done being set). Cleared under program control or by INIT. Read/write.
	1-5	Not used. On read = 0.
	0	Reader Enable - Setting this bit advances the paper tape reader on an LT-33 terminal one character at a time and the setting of this bit clears receiver done (bit 7). Write only. The DLV11-KA 20 mA current loop option is required for operation of this bit.



MR 5116

RBUF Register Bit Assignments

Word	Bit	Function
RBUF	15	Channel Error Status – Logical OR of bits 14, 13, and 12. Read only.
	14	Overrun Error – When set, indicates that the reading of the previously received character was not completed (RCVR done not cleared) prior to receiving a new character. The first character is “lost.” Read only; cleared by INIT being asserted.

NOTE

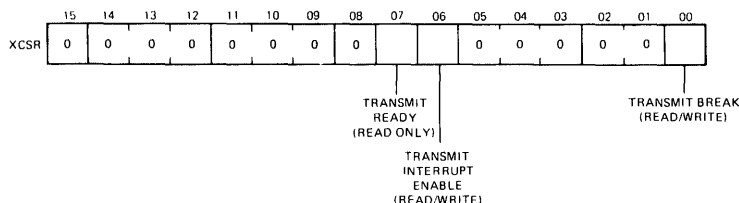
When back-to-back characters are received, one full character time is allowed from the instant when receiver done (bit 7) is set to the occurrence of an overrun error.

13	Framing Error – When set, indicates that the character read had no valid stop bit. This indicates that the currently received character and the next character are invalid. Read only; cleared by INIT.
12	Parity Error – When set, indicates that the parity received does not agree with the expected parity. This bit is always 0 if no-parity operation is configured for the channel. Read only.

NOTE

Error bits remain valid until the next character is received, at which time the error bits are updated.

8–11	Not used. On read = 0.
0–7	Data Bits – Contains seven or eight data bits in a right-justified format. Bit 7 = 0 when seven data bits are enabled. Read only.

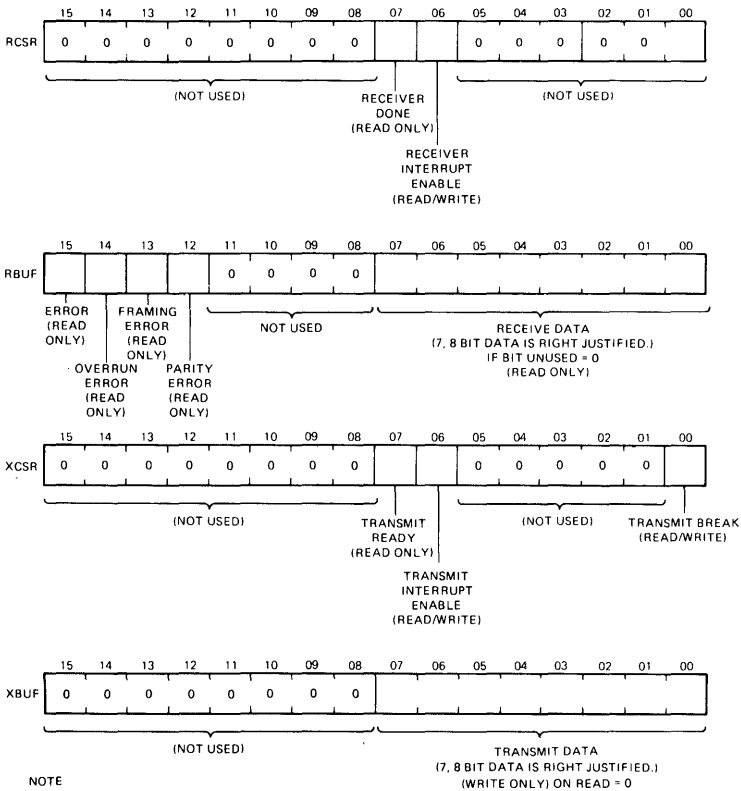


NOTE:
ONE OF FOUR CHANNELS SHOWN.
FORMAT THE SAME FOR ALL CHANNELS.

MR 6117

XCSR Registers Bit Assignments

Word	Bit	Function
XCSR	8-15	Not used. On read = 0.
	7	Transmit Ready - Set when XBUF is empty and can accept another character for transmission. It is also set by INIT during the power-up sequence or during a reset instruction. If transmitter interrupt enable (bit 6) is set, the setting of transmit ready will start an interrupt sequence. Read only.
	6	Transmit Interrupt Enable - Set under program control when it is desired to generate a transmitter interrupt request (when transmitter is ready to accept a character for transmission). The bit is cleared under program control, during power-up sequence, or reset instruction. Read/write.
	1-5	Not used. On read = 0.
	0	Transmit Break - Set or reset under program control. When set, a continuous space level is transmitted. However, transmit done and transmit interrupt enable can still operate, allowing software timing of break. When not set, normal character transmission can occur. Read/write; cleared by INIT being asserted.



NOTE
ONE OF FOUR CHANNELS SHOWN.
FORMAT THE SAME FOR ALL CHANNELS.

MR 5534

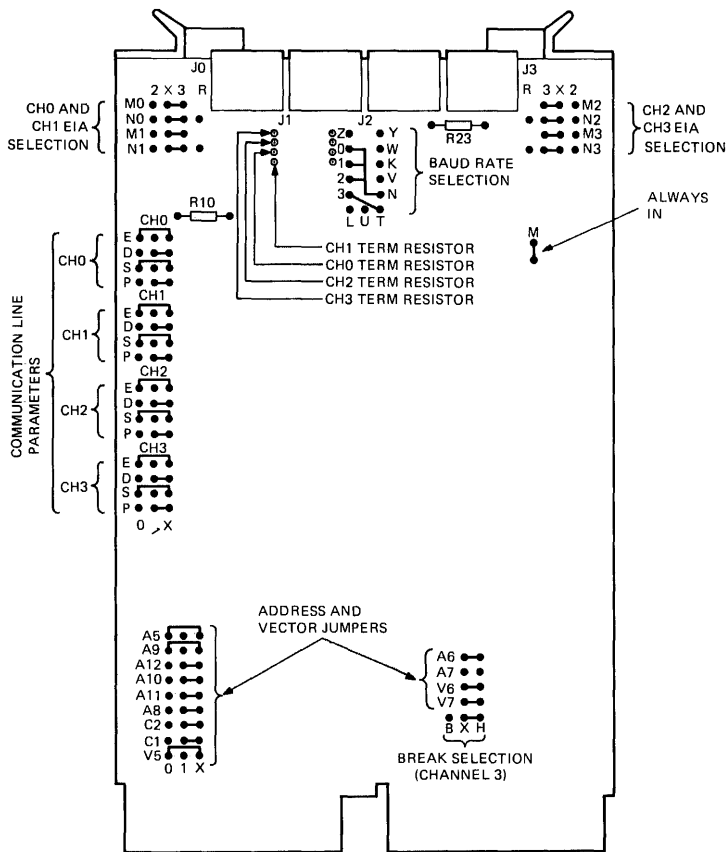
DLV11-J SLU Register Formats

XBUF Register Bit Assignments

XBUF	8-15	Not used. On read = 0.
	0-7	Data bits - Contains seven or eight right-justified data bits. Loaded under program control for serial transmission. Write only.

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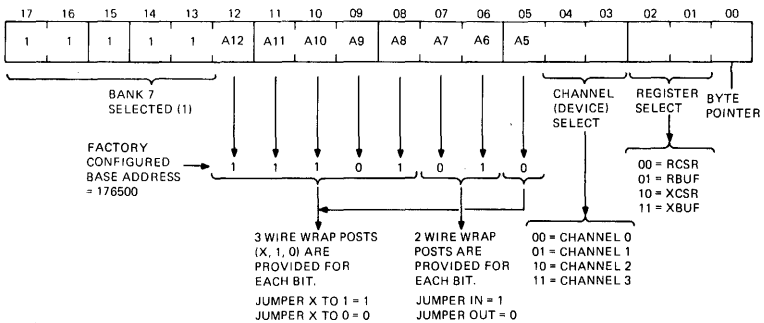
Jumper Configurations



MR-1323

DLV11-J Component and Jumper Factory Configuration Summary

Address Selection



NOTE:
 RANGE 160000_h–177770_h NONEXTENDED ADDRESS
 760000_h–777770_h EXTENDED ADDRESS

MR-0693

Device Register Address Format

It is possible to independently configure the last four addresses (channel 3) to the LSI-11 console device (addresses 177560–177566) when certain base addresses and console select jumpers* are installed. In this configuration, the preceding addresses (channels 0, 1, and 2) are not affected; they are normal offsets of the configured base device address as shown in the following table.

General Device Register Address Assignments (Without Console Selected)

Address	Device Register
Module Base Address (BA)	Channel 0 RCSR
BA + 2	Channel 0 RBUF
BA + 4	Channel 0 XCSR
BA + 6	Channel 0 XBUF
BA + 10	Channel 1 RCSR
BA + 12	Channel 1 RBUF
BA + 14	Channel 1 XCSR
BA + 16	Channel 1 XBUF
BA + 20	Channel 2 RCSR
BA + 22	Channel 2 RBUF
BA + 24	Channel 2 XCSR
BA + 26	Channel 2 XBUF
BA + 30	Channel 3 RCSR
BA + 32	Channel 3 RBUF
BA + 34	Channel 3 XCSR
BA + 36	Channel 3 XBUF

*Console select jumpers C1 and C2 installed select channel 3 as console device.

**General Device Register Address Assignments
(General Configuration With Console Selected)**

Address	Device Register
Module Base Address (BA)	Channel 0 RCSR
BA + 2	Channel 0 RBUF
BA + 4	Channel 0 XCSR
BA + 6	Channel 0 XBUF
BA + 10	Channel 1 RCSR
BA + 12	Channel 1 RBUF
BA + 14	Channel 1 XCSR
BA + 16	Channel 1 XBUF
BA + 20	Channel 2 RCSR
BA + 22	Channel 2 RBUF
BA + 24	Channel 2 XCSR
BA + 26	Channel 2 XBUF
177560	Channel 3* RCSR
177562	Channel 3 RBUF
177564	Channel 3 XCSR
177566	Channel 3 XBUF

*Channel 3 is enabled as a console device.

**Specific Device Register Address Assignments
(DLV11-J Configured With BA = 176500 and BV = 300
Without Console Selected)**

Address	Register	Vector	Channel
176500 176502	RCSR RBUF	300	Channel 0
176504 176506	XCSR XBUF	304	
176510 176512	RCSR RBUF	310	Channel 1
176514 176516	XCSR XBUF	314	
176520 176522	RCSR RBUF	320	Channel 2
176524 176526	XCSR XBUF	324	
176530 176532	RCSR RBUF	330	Channel 3
176534 176536	XCSR XBUF	334	
177560 177562	RCSR RBUF	60	Channel 3 Console Device
177564 177566	XCSR XBUF	64	

NOTE

All addresses are in octal notation.

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Vector Selection

When channel 3 is configured as the console device interface using console select jumpers C1 and C2, the interrupt vectors of the channel become 60 and 64. This is true regardless of the configured base vector of the module. It should be noted that the preceding channels (0, 1, and 2) are not affected and their vectors are normal offsets of the base vector configured, as shown in the following table.

**General Vector Assignments
(Without Console Selected)**

Vector Offsets	Interrupt Vector
Module Base Vector (BV)	Channel 0 Receiver
BA + 4	Channel 0 Transmitter
BA + 10	Channel 1 Receiver
BA + 14	Channel 1 Transmitter
BA + 20	Channel 2 Receiver
BA + 24	Channel 2 Transmitter
BA + 30	Channel 3 Receiver
BA + 34	Channel 3 Transmitter

**General Vector Assignments
(With Console Selected)**

Vector Offsets	Interrupt Vector
Module Base Vector (BV)	Channel 0 Receiver
BA + 4	Channel 0 Transmitter
BA + 10	Channel 1 Receiver
BA + 14	Channel 1 Transmitter
BA + 20	Channel 2 Receiver
BA + 24	Channel 2 Transmitter
60	Channel 3 Receiver*
64	Channel 3 Transmitter*

*Console selected

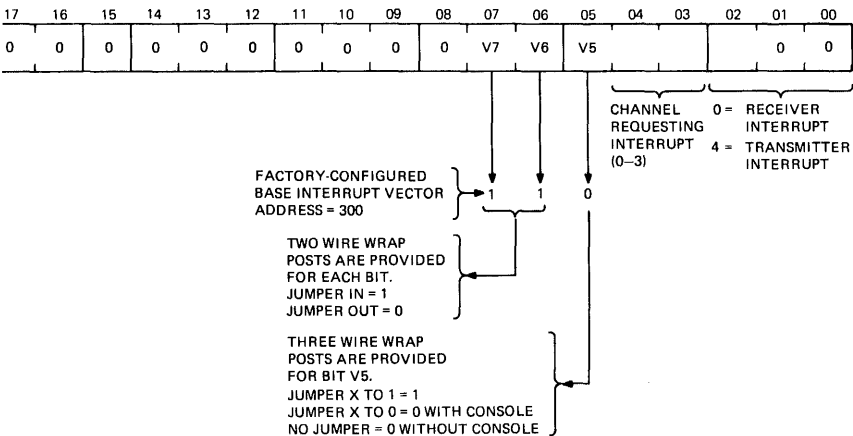
**Specific Vector Assignments
(DLV11-J Configured With BV = 300
Without Console Selected)**

Octal Vector	Interrupt Vector
300	Channel 0 Receiver
304	Channel 0 Transmitter
310	Channel 1 Receiver
314	Channel 1 Transmitter
320	Channel 2 Receiver
324	Channel 2 Transmitter
330	Channel 3 Receiver
334	Channel 3 Transmitter

**Specific Vector Assignments
(Factory-Configured With BV = 300
With Console Selected)**

Octal Vector	Interrupt Vector
300	Channel 0 Receiver
304	Channel 0 Transmitter
310	Channel 1 Receiver
314	Channel 1 Transmitter
320	Channel 2 Receiver
324	Channel 2 Transmitter
60	Channel 3 Receiver*
64	Channel 3 Transmitter*

*Console selected



OTE:
RANGE 0-377g (040g NOT ALLOWED IN CONSOLE MODE)

MR-0895

Console device jumpers are used to select channels as the console interface. These jumpers (C1 and C2) will affect address and vector selection.

Summary of Console Selection Jumper Configurations

Label	Console Selected	Console Not Selected
C1	Install jumper from wirewrap pins X to 1.	Install jumper from wirewrap pins X to 0.
C2	Install jumper from wirewrap pins X to 1.	Install jumper from wirewrap pins X to 0.

Configuring Channel Word Formats

Each DLV11-J SLU channel can be individually configured for number of data bits (7 or 8); even, odd, or not parity; 1 or 2 stop bits, and baud rate (described in the next section). A summary of possible character format jumper configurations is shown below.

Summary of Character Format Jumper Configurations

Label	UART Parameter	X to 0	X to 1	Comments
D	Number of data bits	7 bits	8 bits	LSB is transmitted first
S	Number of stop bits	1 bit	2 bits	
P	Parity inhibit	Parity generation and detection enabled	Parity generation and detection disabled	
E	Even parity enabled	Odd parity enabled	Even parity enabled	Requires P jumper connected from X to 0

NOTE

E jumper must be connected to either 0 or 1, even if the parity bit is disabled. Two stop bits are generally used only with Teletype terminals.

CAUTION

To prevent hardware damage within the channel, the E jumper must ALWAYS be installed. This is true regardless of the configuration of the P (parity) jumper.

Baud Rate Selection

NOTE

A 110 baud rate clock generator circuit is contained on the optional DLV11-KA 20 mA option. When 110 baud operation is desired, do not connect the baud rate jumper on the DLV11-J module for that particular channel. The 110 baud rate will be supplied by the DLV11-KA option through the interface connector.

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Configure baud rates (except 110 baud) by connecting a jumper from an appropriate baud rate generator output wirewrap pin to the baud rate clock input pin (labeled 0-3); one jumper is required for each channel. Baud rate generator outputs are identified below.

Baud Rate Generator Outputs	
Wirewrap Pin Label	Baud Rate (Bit/S)
U	150
T	300
V	600
W	1200
Y	2400
L	4800
N	9600
K	19200
Z	38400

NOTE

If more than one channel requires the same baud rate, the wirewrap jumpers may be daisy-chained.

Channel 3 Break Response

Channel 3 (normally used as the console device) can respond to a break condition on the receive line such as when an operator presses the BREAK key on the associated terminal. The BREAK key transmits a continuous space signal which is detected by the DLV11-J circuits as a framing error. If no operation is desired, do not connect jumpers to the B, X, and H wirewrap pins.

Channel 3 Break Operation Jumper Summary

Break Response Operation	Jumper Connection
Boot	Install jumper between wirewrap pins X and B.
Halt	Install jumper between wirewrap pins X and H.
No response	No jumper installed.

**Summary of Serial Channel Signal Level
Compatibility Configurations**

Serial Channel Signal Level

Serial Channel Signal Level Modifiers	EIA RS-422	EIA RS-232C and RS-423	20 mA Current Loop (Required DLV11-KA Option)
M0-3 jumpers	Connect wire-wrap pins X and 2.	Connect wire-wrap pins X and 3.	Connect wirewrap pins X and 3.
N0-3 jumpers	Connect wire-wrap pins X and 2.	Connect wire-wrap pins X and 3.	Connect wirewrap pins X and R for program-controlled paper tape reader functionality.
Termination resistor (one per channel)	Install a 100 Ω , 1/4 W, non-wirewound, fusible resistor.	No resistor installed.	No resistor installed.
Wave shaping resistor, one per channel pair (channel pairs 0 and 1; 2 and 3).	Not required.	Install resistor (see next table). 1/4 W non-wirewound.	Install 22 K Ω non-wirewound resistor.

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EIA RS-422 - To configure an SLU channel for EIA RS-422 signal levels, connect the M(M0-M3) and N(N0-N3) jumper wirewrap pin X of the desired channel to the respective wirewrap pin 2. Install (solder) a 100 ohm, 1/4 W fusible resistor (non-wirewound) into the termination resistor mounting pads for the channel being configured. The resistor must be removed for any configuration other than EIA RS-422.

EIA RS-423 and RS-232C - To configure an SLU channel to be compatible with both the EIA RS-423 and RS-232C (which on the DLV11-J are met simultaneously), connect each M(M0-M3) and N(N0-N3) jumper X wirewrap pin of the desired channel to the respective wirewrap pin 3.

Slew Rates - The signal rise and fall time may be controlled on EIA RS-423 and RS-232C SLU channel configurations by installing (soldering) an appropriate value of non-wirewound, 1/4 W resistor into the wave-shaping resistor pads provided (R10 and/or R23). An appropriate resistor value can be selected by referring to the following table. The value of resistor R10 determines the slew rate of both channels 0 and 1 which are simultaneously set to the same value. Similarly, R23 controls the slew rate of both channels 2 and 3.

EIA RS-423 and RS-232C Wave-Shaping Resistor Values

Baud Rate	Wave-Shaping Resistor
38.4K	22 k Ω
19.2K	51 k Ω
9.6K	120 k Ω
4.8K	200 k Ω
2.4K	430 k Ω
1.2K	820 k Ω
600.0	1 M Ω
300.0	1 M Ω
150.0	1 M Ω
110.0	See Note.

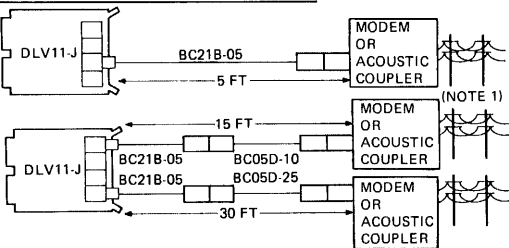
NOTE

Determined by other channel of the two-channel pair.

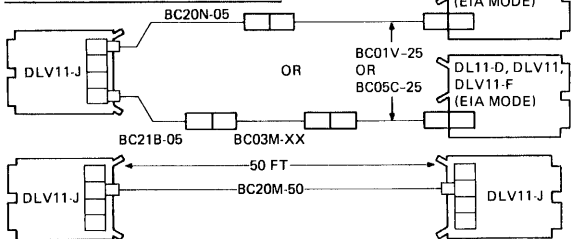
20 mA Current Loop - To configure an SLU channel for 20 mA current loop operation, connect the M(M0-M3) jumper pin X to pin 3 for the desired channel. If the 20 mA terminal contains a paper-tape reader that can be program-controlled (such as a DEC-modified LT-33 Teletype or Teletype ASR-33 with LT22-MD modification kit), connect wirewrap jumper N(N0-N3) pin X to the respective pin R.

When the DLV11-KA 20 mA current loop option is connected to the channel interface connector, operating power for the option circuits is supplied by the DLV11-J. To configure a channel for 110 baud operation, enable the 110 baud rate clock on the DLV11-KA option and remove the baud rate selector jumper for the channel on the DLV11-J module. The clock needed by the DLV11-J is automatically supplied through the serial line connector cable.

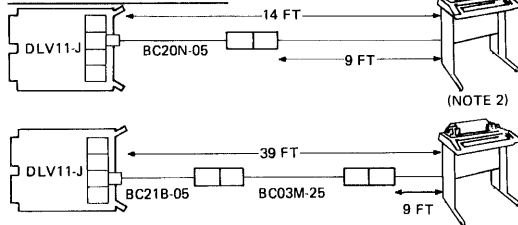
DLV11-J TO MODEM OR ACOUSTIC COUPLER



DLV11-J TO SLU CHANNEL INTERFACE



DLV11-J TO LOCAL TERMINAL

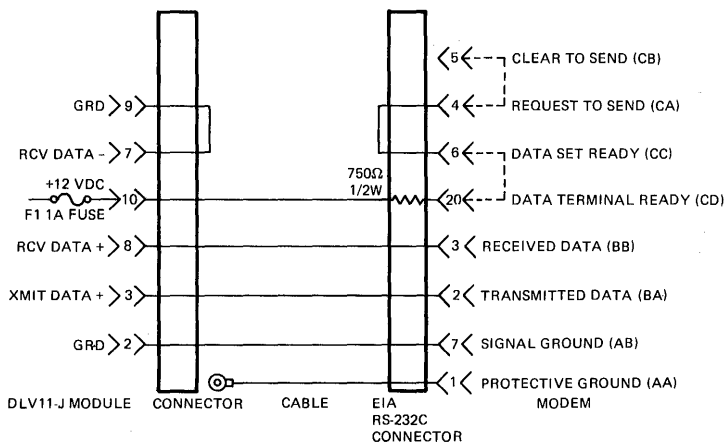
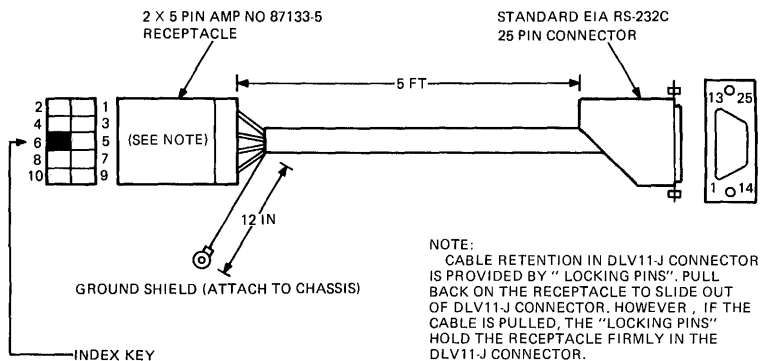


NOTES:

1. MODEM USED IS A "MANUAL TYPE" SUCH AS BELL 103A WITH 804B.
2. DEC EIA RS-232C TERMINALS (VT52, LA36, LS120, ETC.) COME EQUIPPED WITH A 9 FT CABLE. NON-DEC EIA RS-232C TERMINALS ARE CONNECTED SIMILARLY EXCEPT 9 FT OF LENGTH MUST BE DEDUCTED FROM THE TOTAL CABLE LENGTH.

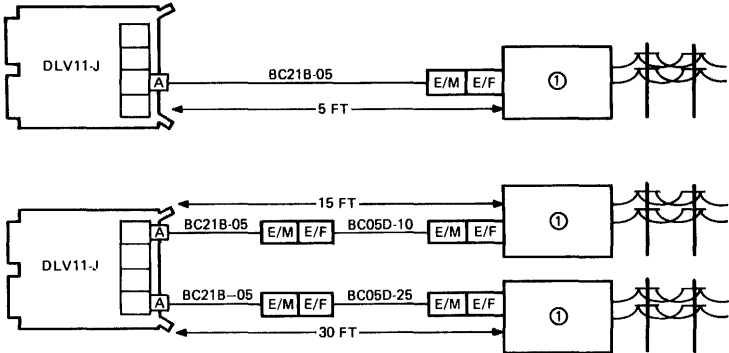
DLV11-J Cabling Summary

MR-1326



MR-1280

BC21B-05 Peripheral Device Cable



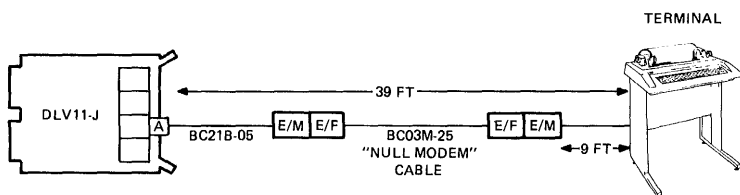
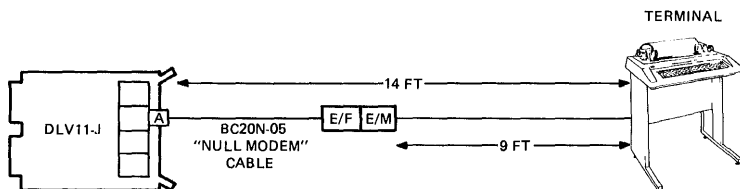
NOTES:

- ① MODEM OR ACOUSTIC COUPLER.
MODEMS SHOWN ARE "MANUAL" MODEMS
SUCH AS BELL 103A DATA SETS WITH 804B
AUXILIARY SET.

- [A] = 2 X 5 PIN AMP NO 87133-5 CON-
NECTORS
[E/M] = EIA RS-232C 25 PIN MALE CON-
NECTORS
[E/F] = EIA RS-232C 25 PIN FEMALE CON-
NECTORS

MR-1281

DLV11-J to Modem or Acoustic Coupler



NOTES

TERMINALS SHOWN ARE DEC EIA RS-232C
TERMINALS (SUCH AS VT52, LA36, LS120,
ETC.)

DEC TERMINALS ARE CONSTRUCTED WITH 9
FOOT CABLES, WHEN USING NON-DEC EIA
RS-232C TERMINALS DEDUCT 9 FEET FROM
THE TOTAL CABLE LENGTH.

A = 2 X 5 PIN AMP NO 87133-5 CONNec-
TORS

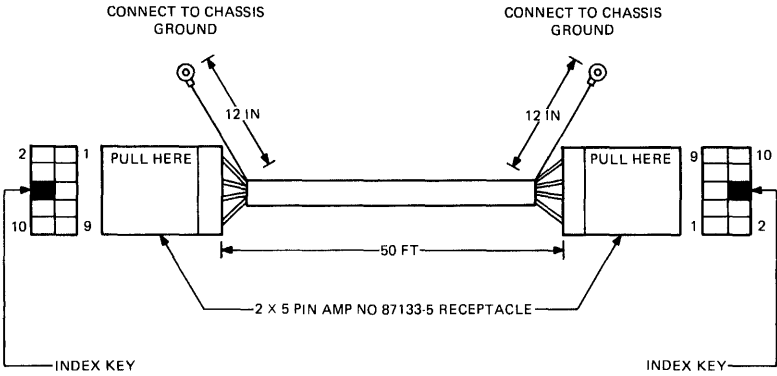
E/M = EIA RS-232C 25 PIN MALE CONNec-
TORS

E/F = EIA RS-232C 25 PIN FEMALE CONNec-
TORS

MR-1282

Local Terminal Cabling

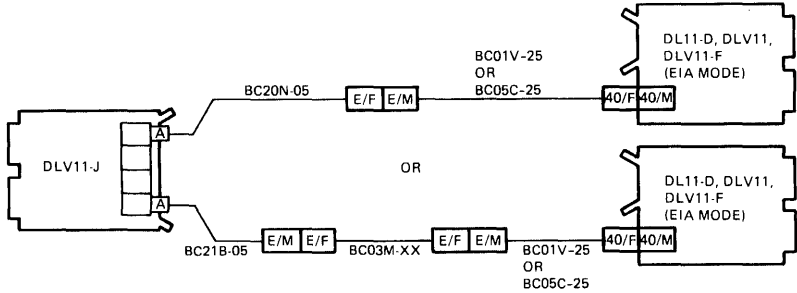
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NOTE
BOTH CONNECTORS HAVE THE SAME CABLE
RETENTION MECHANISM. CABLE RETEN-
TION IS PROVIDED BY "LOCKING PINS".
PULL ON RECEPTACLE TO RELEASE.

MR 1283

BC20M-50 DLV11-J to DLV11-J Cable



- A** = 2 x 5 PIN AMP NO 87133-5 CONNECTORS
- E/M** = EIA RS-232C 25 PIN MALE CONNECTORS
- E/F** = EIA RS-232C 25 PIN FEMALE CONNECTORS
- 40/M** = 40 PIN BERG MALE CONNECTORS
- 40/F** = 40 PIN BERG FEMALE CONNECTORS

MR-1328

DLV11-J to SLU Module Cabling