

SM 27547
Model 420

**Programmable Terminal
Interface**

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REVISION HISTORY		
ECO #	DATE	DESCRIPTION
0010	3/19/82	Changed Page 10-5
0110	4/21/83	Changed Pages 2-1, 2-3, 3-1, 8-2
0328	6/28/84	New ZETACO Cover

CUSTOMER SERVICE

Our warranty attests the quality of materials and workmanship in our products. If malfunction does occur, our service personnel will assist in any way possible. If the difficulty can not be eliminated by use of the following service instructions and technical advise is required, please phone the Custom Systems sales department (612-941-9480) giving the serial number, board name, model number, and problem description. You will be placed in contact with the appropriate technical assistance.

PRODUCT RETURN

Pre-return Checkout.

If controller malfunction is suspected, the use of test software is needed to determine if the controller is the problem and what in particular is wrong with the controller. The tests applicable to this board are listed on the next page of the manual. Please run the test sequence before considering product return.

Returned Material Authorization.

Before returning a product to Custom Systems for repair, please ask our sales secretary for a "Returned Material Authorization" number. Each product returned requires a separate RMA number. Use of this number in correspondence and on a tag attached to the product will ensure proper handling and avoid unnecessary delays.

Returned Material Information.

Information concerning the problem description, system configuration, diagnostic program name, revision level, and results, i.e., error program counter number should be included with the returning material. A form is provided for this information on the next page of the manual.

Packaging.

To safeguard your materials during shipment, please use packaging that is adequate to protect it from damage. Mark the box "Delicate Instrument" and indicate the RMA number(s) on the shipping label.

MATERIAL RETURN INFORMATION

All possible effort to test a suspected malfunctioning controller should be made before returning the controller to Custom Systems, Inc. for repair. This will: 1) Determine if in fact the board is defective (many boards returned for repair are not defective, causing the user unnecessary system down-time, paper work, and handling while proper testing would indicate the board is working properly). 2) Increase the speed and accuracy of a product's repair which is often dependent upon a complete understanding of the user checkout test results, problem characteristics, and the user system configuration. Checkout results for the Programmable Terminal Interface should be obtained by performing the following tests. (Include error program counter #'s and accumulator contents if applicable).

<u>TEST</u>	<u>RESULTS</u>
1. PMUXD	
2. PMUXR or D.G. 4200 Reli	
3. PMUXE	

Other tests performed:

Please allow our service department to do the best job possible by answering the following questions thoroughly and returning this sheet with the malfunctioning board.

1. Does the problem appear to be intermittent or heat sensitive? (If yes, explain).

2. What operating system are you running under? (AOS RDOS, DDOS, DTOS).

3. Describe the system configuration (i.e., peripherals, I/O controllers, model of computer, etc).

4. Has the controller been returned before? _____ Same problem? _____

To be filled out by CUSTOMER:

Model #: _____

Serial #: _____

RMA #: _____

Returned by: _____

(company name)

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PROGRAMMABLE TERMINAL INTERFACE

1.0 INTRODUCTION

The Programmable Terminal Interface (PTI) is a multi-line communications controller designed to interface any Data General Nova* or Eclipse* to sixteen local displays, serial printers or Bell 103 modems (manual answer only.) The PTI's programmable features allow the user to re-configure for different terminal types without making hardware changes.

Several PTI's may be combined with a Data Control Unit to provide a complete multiprocessor communications system residing within the CPU chassis. Other features of the PTI include: Full/Half duplex operation, line speeds from 50 to 19,200 baud, programmable line characteristics (parity, stop bits, character length) and switch selectable 20 MA current loop or EIA RS-232C line interface.

*Nova and Eclipse are trademarks of Data General Corporation

2.0 INSTALLATION INSTRUCTIONS

2.1 UNPACKING

Upon receiving the interface package, unpack the contents and inspect the board for visual damage. If any damage is apparent, do not attempt to install the controller but notify Custom Systems, Inc., immediately.

2.2 BOARD INSTALLATION

The controller board may be installed in any general I/O, memory -I/O or I/O only slot of the Data General Nova or Eclipse mini-computer. Install the controller in the desired slot, component side up and lock into position with release levers (see figure 2.1) CAUTION: Be sure keyways in backplane connector line-up with slots in controller board edge connector and arrows on ribbon cable plug match arrows on cable connector (see Inset - Figure 2.1).

If with the selection of the I/O slot, a vacant slot or slots exist between the controller and the board below it, the DCHP (Data Channel Priority) and the INTP (Interrupt Priority) signals must be physically jumpered on the computer backpanel to maintain priority interrupt continuity. Install one end of a wire-wrap jumper to the DCHP - OUT signal at pin 93 at the "A" connector occupied by the device below the controller. Connect the remaining end to the DCHP - IN signal at pin 94 of the "A" connector occupied by the controller, bridging the vacant slot or slots. Similarly, connect the INTP - OUT signal (pin A-95) from the lower device to the INTP - IN signal at pin A-96 of the controller. This will complete the priority interrupt continuity to the card. If vacant slots exist between the controller and the device above the controller, perform similar strapping of the DCHP and INTP signals to maintain interrupt priority.

CAUTION: Be sure no existing cabling or devices are connected to the backplane of the slot in which the PTI is to be installed.

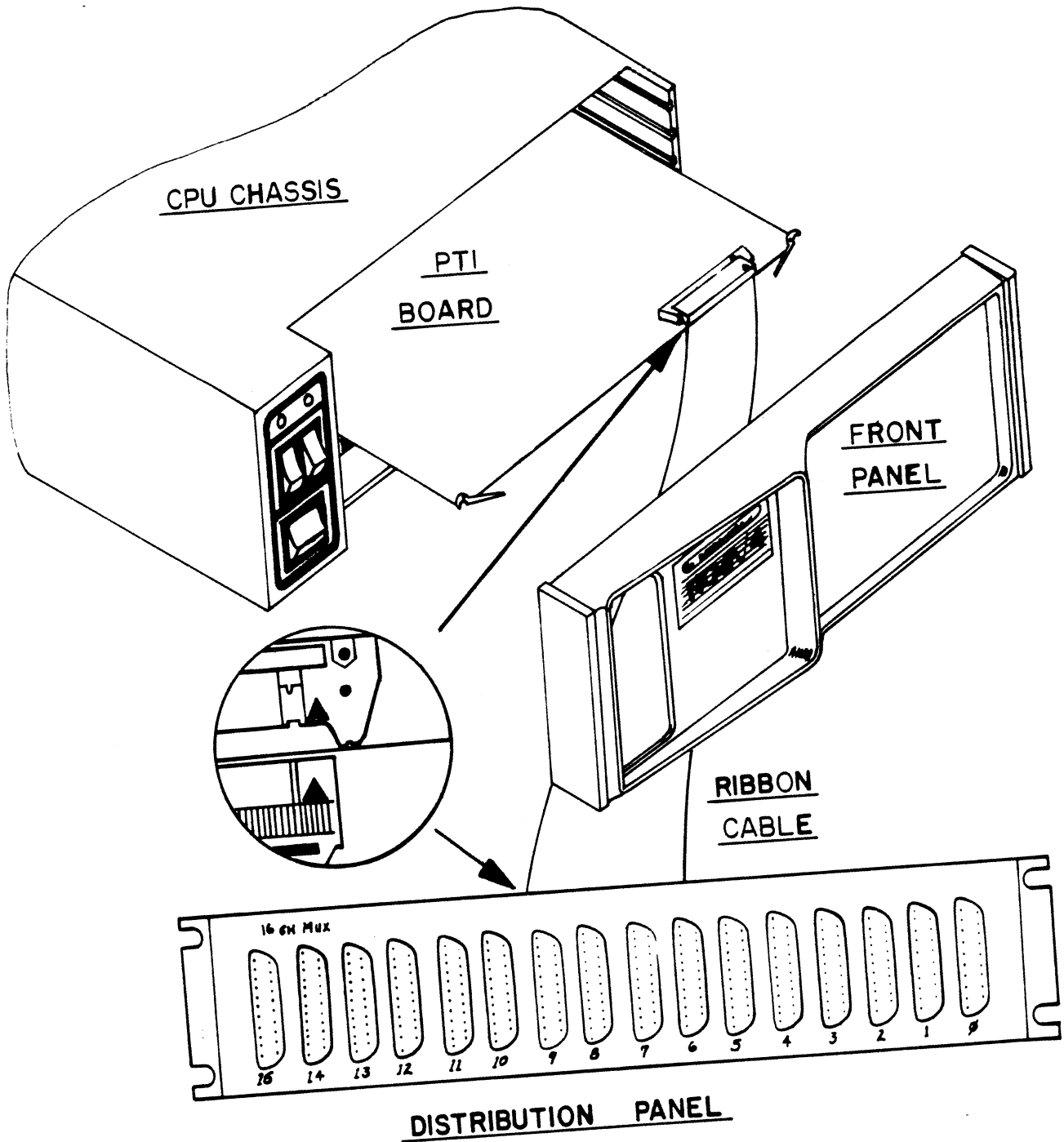


FIGURE 2.1 BOARD INSTALLATION

2.3 COMPUTER BACKPANEL

The backpanel of the computer provides a means for interconnecting the computer, memory, console and various controller boards and cabling to external peripheral equipment. The back panel is the vertical printed circuit board mounted on the left side of the computer chassis when viewed from the front.

On the side of the back panel facing into the chassis are pairs of printed circuit board female edge connectors one pair for each slot. The contact of these connectors protrudes through the backpanel to the left side of the minicomputer chassis.

When the male edge connectors of a printed circuit board are inserted into the female edge connectors of a slot, finger contacts on the male edge connectors meet contacts in the female edge connectors. Electrical connections to boards can, therefore, be made to pins on the back panel.

For each controller card slot, there are two horizontal parallel rows of 100 pins on the backpanel. The left group of pins is the A connector, and the right group (as viewed from the left side of the computer) is called the B connector. Numbering of each group of 100 pins is as indicated below (shown only for connector A).

BACK PANEL NUMBERING

A2	A1
A4	A3
A6	A5
A8	A7
A10	A9
A12	A11
A14	A13
A16	A15
A18	A17
A20	A19
A22	A21
A24	A23
A26	A25
A28	A27
A30	A29
A32	A31
A34	A33
A36	A35
A38	A37
A40	A39
A42	A41
A44	A43
A46	A45
A48	A47
A50	A49
A52	A51
A54	A53
A56	A55
A58	A57
A60	A59
A62	A61
A64	A63
A66	A65
A68	A67
A70	A69
A72	A71
A74	A73
A76	A75
A78	A77
A80	A79
A82	A81
A84	A83
A86	A85
A88	A87
A90	A89
A92	A91
A94	A93
A96	A95
A98	A97
A100	A99

3.0 CONFIGURATION

The PTI may be configured to operate in one of two modes - The first is the CPU Mode - in this mode, the controller board responds to commands from the CPU via the backplane. This requires the CPU to handle all communications on a character by character basis - greatly increasing processor overhead.

The second mode, or DCU mode, allows a Data Control Unit to directly control the PTI. The PTI resides in the CPU chassis using only power from the backplane. A jumper plug is used to pass signals from the DCU/50 or DCU/200 to the controller board. Up to sixteen PTI's (256 total lines) may be daisy chained off the DCU to provide a complete communications system with minimal system overhead.

When operating with the DCU - Be sure jumper J3-1 is out or cut (J3-1 is located near chip location A-1.) Refer to figure 3-1 for installation of DCU to PTI backplane jumper plug.

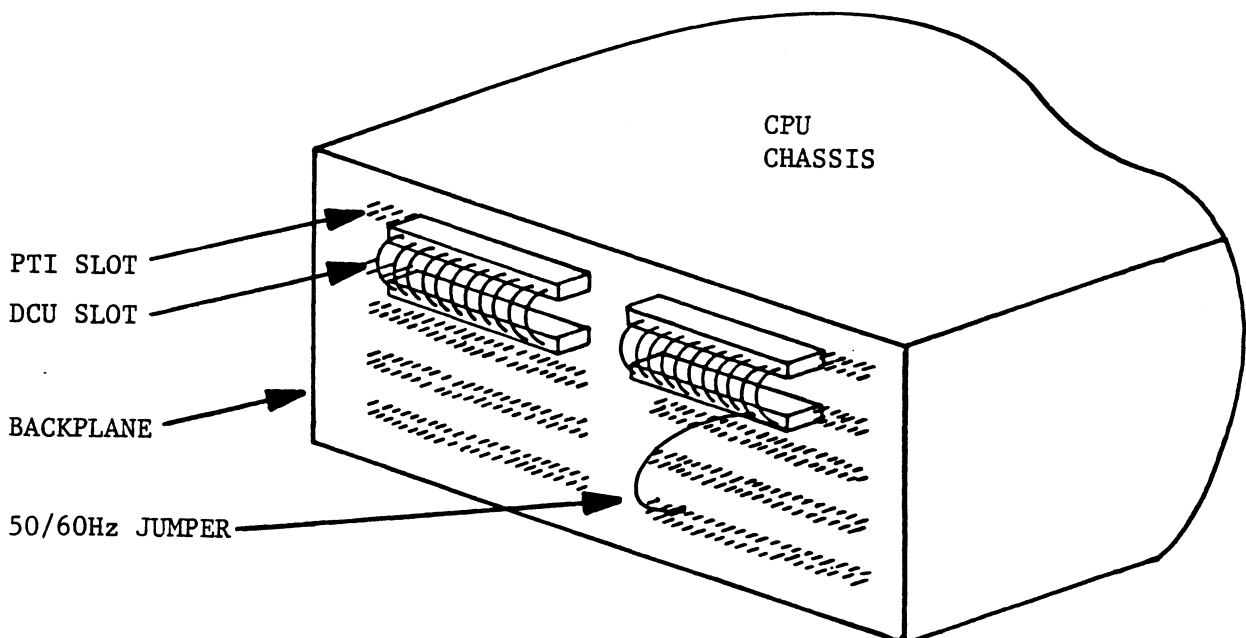


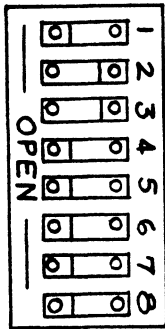
FIGURE 3.1 DCU JUMPER INSTALLATION

4.0 ADDRESSING

The PTI is accessed via a single device code with sixteen (16) lines residing within the controller. The primary and secondary device codes are 34_8 and 44_8 respectively, with a mask bit of 8. The line addresses of the board represent sixteen consecutive lines of a possible 256. The controller's line select logic may be disabled for any reason simply by closing a switch (see below for switch layout.)

ADDRESSING SWITCH - (Location L-4)

O=OPEN , C=CLOSED



SW1 = Device Code Sel 0 = 34 , C = 44
SW2 = Line Sel 3
SW3 = Line Sel 2 0 = Logic "1"
SW4 = Line Sel 1 C = Logic "0"
SW5 = Line Sel 0
SW6 = Line Select Control 0=Enabled,C=Disabled
SW7 = NU
SW8 = NU

NOTE: Line Select Control must be enabled for board to function properly.

SHOWN:
Device Code 34 - Select
Lines 60_8 to 77_8 - Decoded
Line Select Enabled

5.0 OPERATION

5.1 GENERAL

Each line of the Programmable Terminal Interface is split into two individual sections, a transmitter and a receiver. Each of these sections may be enabled to Set Done if it requires service.

The PTI operates in two modes, offline (diagnostic) mode or online mode. In diagnostic mode the program provides the timing pulses via a NIOP mux instruction allowing the testing of onboard counters and sequenced logic. In the online mode all timing is provided by a crystal and each individual line section is being scanned on a prioritized basis to see if any service is required.

There are six device commands/flags that control or indicate conditions within the PTI, these are:

- BUSY - Active during initiation of mux after a start or I/O reset
- DONE - Active whenever an enabled line section of board requires service
- F = S - Start pulse - Sets busy active, clears done, puts board online while initiation occurs, puts board offline and then clears busy
- F = C - Clears pulse - Clears done and/or puts board online (If it is not already)
- F = P - I/O pulse - Diagnostic mode clock stepper - No effect in online mode
- I/O Reset - Same as start - However goes to all boards in chassis - (same as power on)

OPERATION (cont.)

5.2 INITIALIZATION - The PTI is initialized by executing a start or IORESET command. This will put the board offline, loopback, done flag, and all the scanner logic will be cleared. All lines should be configured per system requirements before it is placed online.

5.3 RECEIVER - The receiver section does the conversion from the peripheral's serial data stream to the CPU's parallel character format. When a character has been received a program interrupt is initiated (if enabled). A Data in A is executed to determine which line and section requires service. If data bit 15 is a one - a transmitter needs service, If it is a zero - Then a receiver has a character. A Data in C will pass the status of the received character - parity error, framing error (missing stop bits) or overrun error. While a Data in B will pass the character - Right justified onto the CPU's data bus. Done should be cleared using a NIOC mux or DIBC mux instruction to allow the remaining line sections to be scanned.

5.4 TRANSMITTER - The transmitter handles the serialization of data characters being passed to the peripheral. If enabled it will initiate a program interrupt whenever it can transmit another character. If used, the "clear to send" handshake signal from the peripheral must be active in addition to the line being enabled before done will be set for an empty transmitter. If "clear to send" is not used (as in current loop) its input is forced active. Data is transmitted via a Data out B instruction to a selected line. A transmitter done condition can be cleared by a NIOC mux or a DOBC mux. A line break condition may be forced by executing a transmit break instruction forcing all zeros to be sent. The break condition is cleared by transmitting another character.

OPERATION (cont.)

Since there are 16 lines of the PTI a prioritized scanning technique is used to resolve any conflicts. The lines are scanned as follows:

LINE	0	Receiver	- Top Priority
LINE	15	Receiver	-
LINE	0	Transmitter	-
LINE	15	Transmitter	- Lowest Priority

It takes approximately 325 micro seconds to scan each line section requiring up to 104 micro seconds or one bit time at 9,600 baud to find a line section requiring service. Care should be taken to avoid lost data errors resulting from a low priority line being pre-empted by a higher speed-high priority line.

The done flag is set (and an interrupt occurs, if the mask is off) whenever any of the following conditions are met:

- RECEIVER - The specific receiver section is enabled and the receive character buffer is full (one character time is allowed before an overrun condition occurs).
- TRANSMITTER - The specific transmitter section is enabled and the transmitter holding register is empty and the lines "clear to send" input is active or left open (not used).

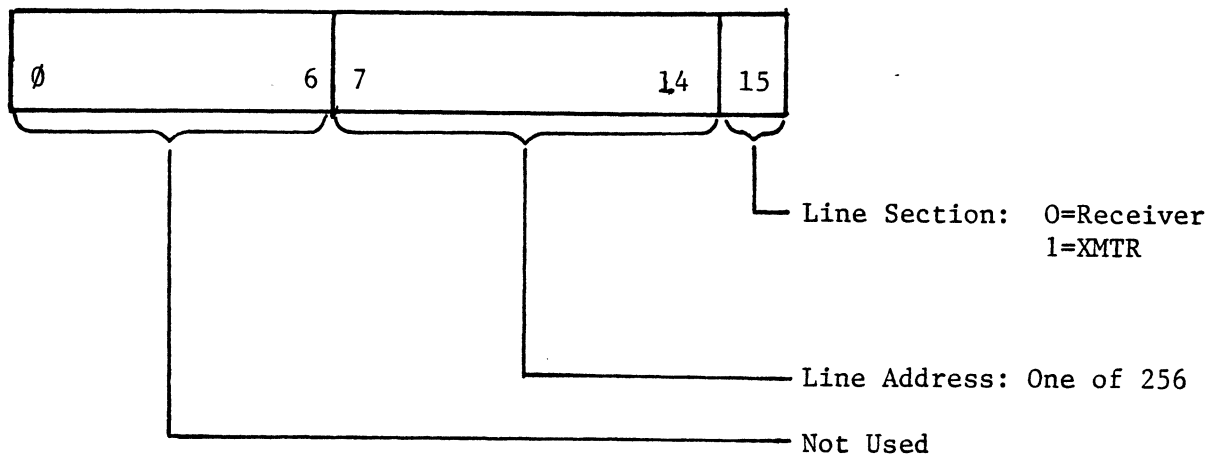
OPERATION (cont.)

5.5 LOOP BACK - Testing of the Async line is essential to insure data integrity. Loop back mode connects the transmit data path to the receive data input allowing a short test to insure operation or a full blown block compare test which tests all parameters - Such as a reliability test. Loop back on forces "clear to send" active.

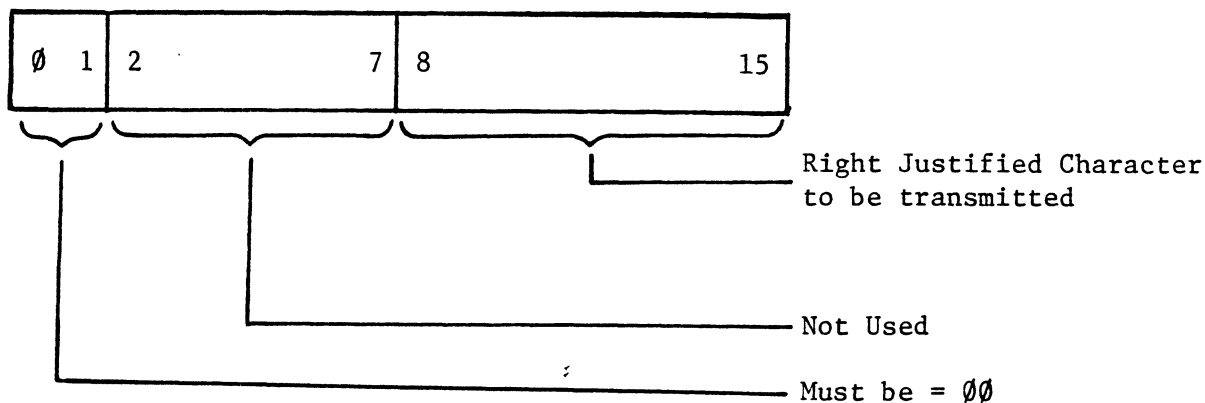
6.0 PROGRAMMING

The Programmable Terminal Interface controller will respond to eight (8) instructions which control the various functions of serial communications. However, some instructions use the same data out command with the contents of the specified accumulator determining how the controller will function. All instructions affect only the "current line address" once it has been specified by a set line and section instruction or a read line and section requesting service instruction. The instructions are as follows:

- 1) Set line and section
DOA (f) AC, MUX

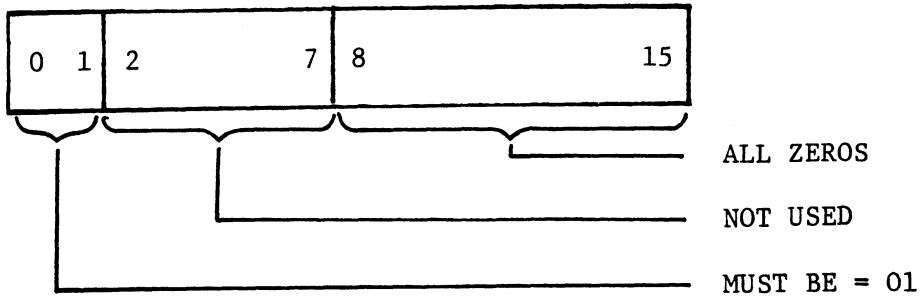


- 2) Transmit Data
DOB (f) AC, MUX

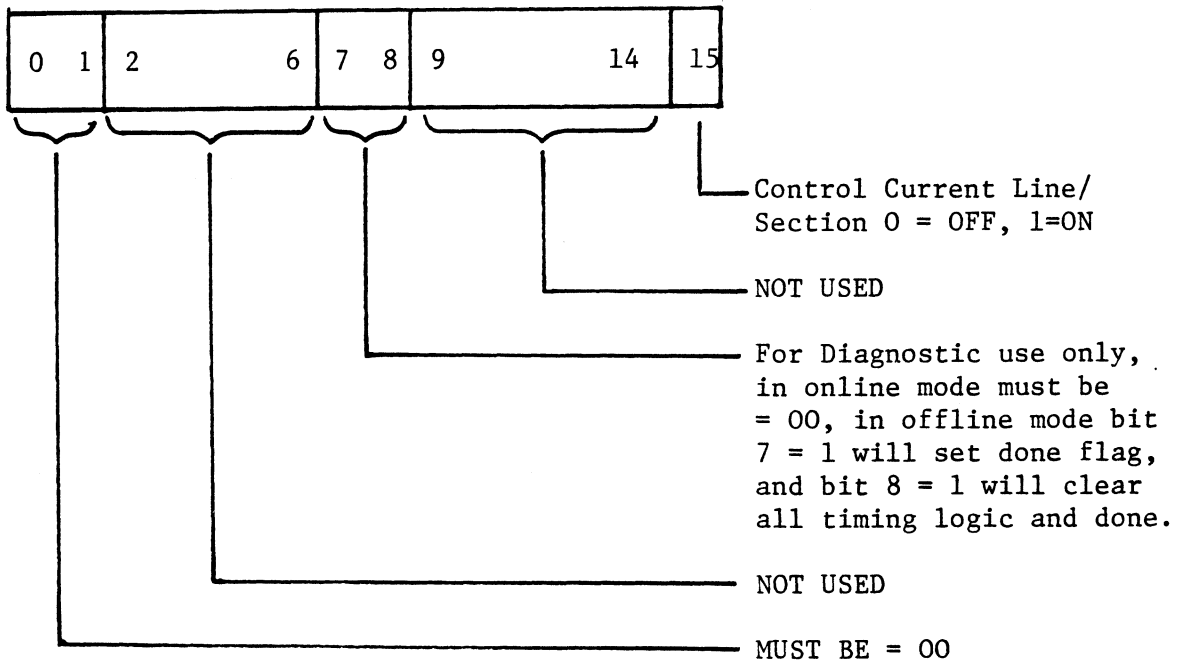


6.0 PROGRAMMING (cont.)

- 3) Transmit Break (All - Zeros)
DOB (f) AC, MUX

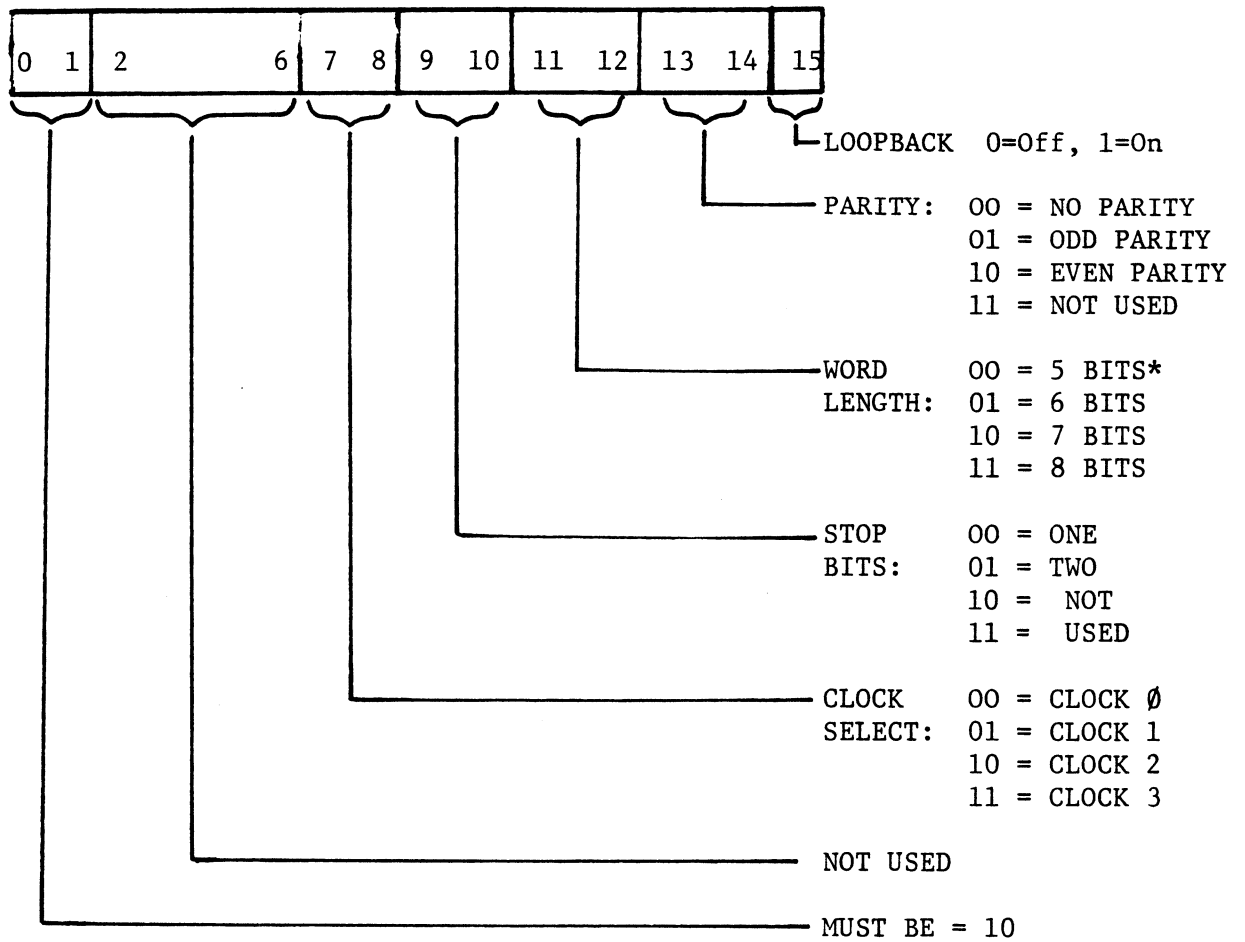


- 4) Control Line Section
DOC (f) AC, MUX



6.0 PROGRAMMING (cont.)

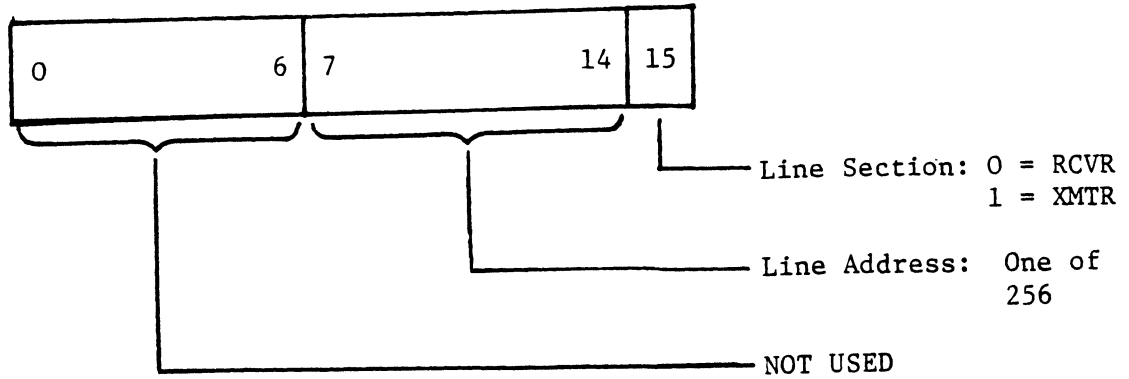
5.) Specify Line Characteristics
 DOC (f) AC, MUX



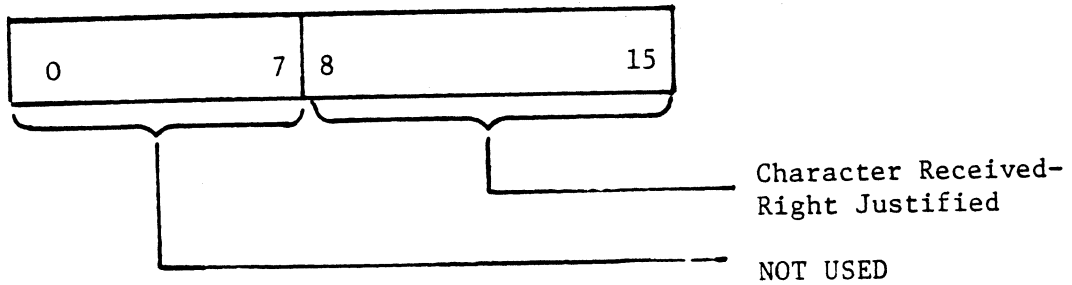
*In 5 BIT Character Length only one or one and one-half stop bits may be selected.

6.0 PROGRAMMING (cont.)

- 6) Read Line and section requesting service
DIA (f) AC, MUX



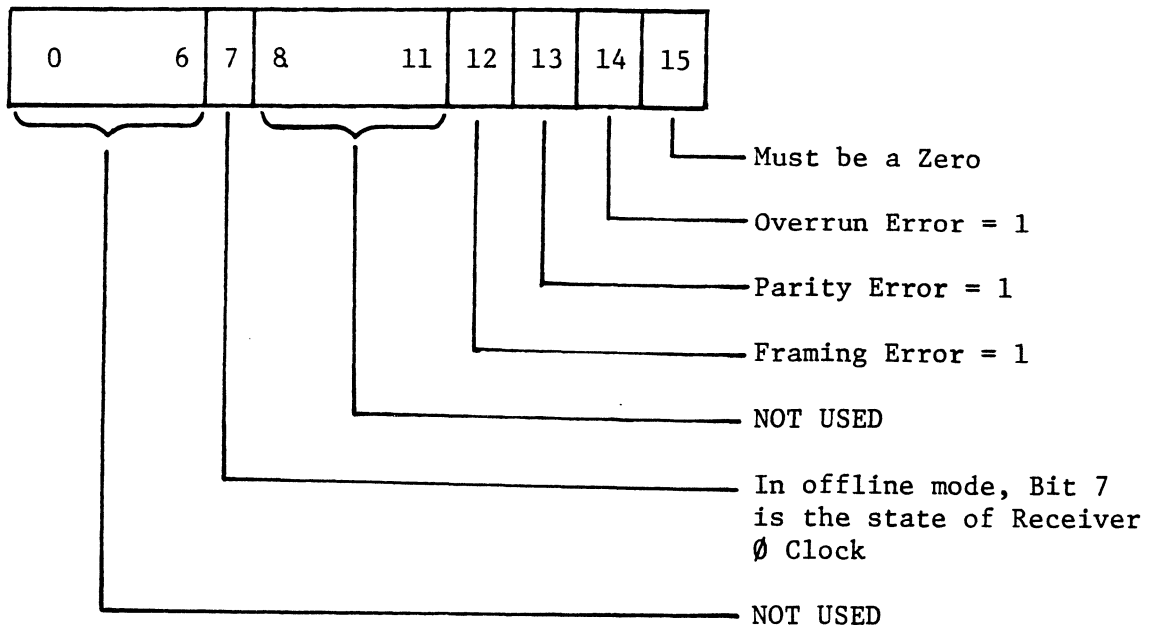
- 7) Read Receive Data
DIB (f) AC, MUX



6.0 PROGRAMMING (cont.)

8) Read Receiver Status

DIC (f) AC,MUX



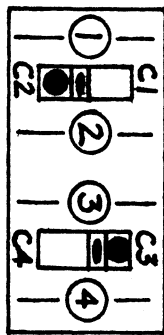
7.0 OPTIONS

7.1 GENERAL

Three major options are present on the PTI. The first is switch selectable line interface (20MA current loop or EIA RS232C). The second is the board's $\overset{+}{-}12V$ power source. And the third is the configuration of the 4 clock sources.

7.2 LINE I/F SELECTION

Line Interface selection is accomplished by setting the respective line interface select switch to either the EIA position (which is RS-232C) or the 20MA position (current loop). Both interfaces are shown below:



Line 0 - Left side of switch depressed -
selects RS-232C line interface

Line 1 - Right side of switch depressed -
selects 20MA current loop line
interface

LINES
0 & 1

SHOWN:
Line 0 = EIA Line 1 = 20MA

Note 1:

Even line number always on top half of double switch, odd line number on bottom half.

Note 2:

Lines not being used should be left in EIA MODE, since the current loop interface pulls up the unused inputs causing the receiver to "see" null characters with framing errors.

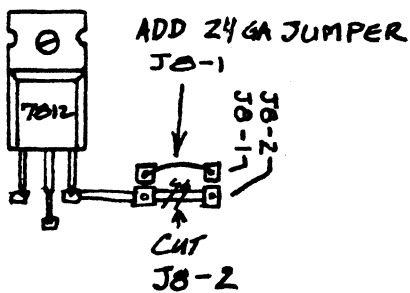
7.0 OPTIONS (cont.)

7.3 12 VOLT POWER SOURCE

The PTI requires +12V for proper operation. The source of this 12 volts depends on which machine is being used. On older machines (Nova-1200,2,3,etc.). The 12 volts is regulated down from +15 volts (VINH - pin A10). In a newer machine (Nova 4, Eclipse S140) +12 volts is available on backplane pin B90. Jumper J8-1 and J8-2 are used to select between the two.

Jumper J8-2 is a heavy foil already in place. This selects the +15 volts to be regulated down to +12 volts.

To alter the source to a straight +12 volts simply cut the foil marked J8-2 on the right of the voltage regulator in location Z F. (See Diagram)

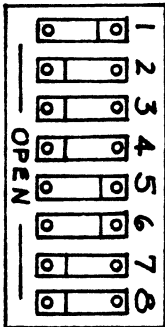
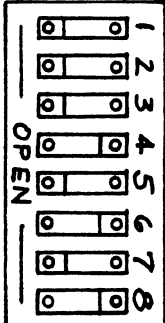
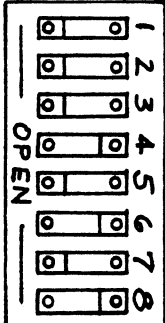
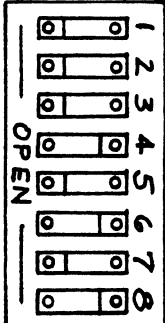


Then add A 24 gauge wire into the jumper marked J8-1

7.0 OPTIONS (continued)

7.4 BAUD RATE SELECTION

Each line may be set up for one of four Baud Rate Clocks. Each of these clocks (CLK \emptyset - CLK 3) may be set to any rate from 50 to 19.2K bps. The switches are set in the following manner:

		SEL				BAUD RATE	
		\emptyset	1	2	3		
	CLK \emptyset	SEL \emptyset	0	0	0	0	50
		SEL 1	1	0	0	0	75
		SEL 2	0	1	0	0	110
		SEL 3	1	1	0	0	134.5
		SEL \emptyset	0	0	1	0	150
	CLK 1	SEL 1	1	0	1	0	300
		SEL 2	0	1	1	0	600
		SEL 3	1	1	1	0	1200
		SEL \emptyset	0	0	0	1	1800
	CLK 2	SEL 1	1	0	0	1	2000
		SEL 2	0	1	0	1	2400
		SEL 3	1	1	0	1	3600
		SEL \emptyset	0	0	1	1	4800
		SEL 1	1	0	1	1	7200
	CLK 3	SEL 1	0	1	1	1	9600
		SEL 2	1	1	1	1	19.2K
		SEL 3					

0 = CLOSED, 1 = OPEN

Shown: CLK \emptyset = 9600 Baud
 CLK 1 = 4800 Baud
 CLK 2 = 1200 Baud
 CLK 3 = 300 Baud

- NOTE: 1) When running diagnostics CLK \emptyset and CLK 1 must be at different rates.
- 2) Excessive errors may result from running the reliability test (P-MUX-RELI) with any clocks at 19,200 Baud.

8.0 DIAGNOSTICS

8.1 GENERAL

A Diagnostic Tape (400-246-00) is provided with the PTI which contains the Diagnostic and Reliability tests as well as a program to exercise a single line connected to a CRT. The tape itself is 800 BPI format with a "T-BOOT" loader. The Reliability Test should be run first to determine if any lines are not working properly. If excessive errors occur, the Diagnostic should be run to isolate and fix the specific problem.

8.2 LOADING DIAGNOSTICS

With the tape loaded on the drive and ready (at load point), initiate a Program Load from tape. If using a machine with a front panel, set the switches to 100022 and hit program load. If a newer machine (Nova 4, S140) is being used, the monitor program resident in the machine will give an exclamation point prompt "!", enter 100022L and hit return. Both of the above procedures will result in the message "From MT0:" being displayed on the console. Enter file desired, and when loaded in, start answering the questions in the Menu. The files and a brief description of each are explained below:

Mag Tape M246

File 0	"T-BOOT" - Loader Program
File 1	Directory - The listing of what is on the tape.
File 2	PTI Diagnostic - Diagnostic for PTI. Requires eight (8) 400T test plugs, To be used for trouble shooting the hardware.

CAUTION: Before running either the PTI Diagnostic or PMUX Reli the user should read the prefix for the specific program (found in the rear of the manual).

- File 3 PMUXRELI - A Reliability Test to be used to isolate any faulty lines and determine if the diagnostics should be run.
- File 4 PTI XMIT/ECHO - An applications type program to exercise a terminal from the PTI board.
- File 5 The previous four save files in Dump Format for storage on a disk.

NOTE: If for any reason the Reliability Test cannot be loaded and run, Data General's 4200 Reli Test may be used.

8.3 USING THE PTI XMIT/ECHO PROGRAM

The PTI XMIT/ECHO Program is used to drive a CRT or similar Serial Device without an operating system. The Program is Menu driven and can be set to interface to any Async Serial Data Format. The Program is controlled completely from the console requiring no front panel.

The PTI XMIT/ECHO Program is on File 4 of the diagnostic tape. It is loaded in the same manner described in Section 8.2. Once loaded, the operator should set the program's parameters to match the Serial Device being interfaced (see Section 10 on attaching devices to the PTI).

The Program is controlled with the following key sequences:

- Control "R" - Re-enter all Program Parameters
- Control "L" - To change Line Address only
- Control "E" - To change to Transmit Data or Echo Keyboard
- Control "D" - To change data being transmitted

9.0 INTERFACE SIGNALS, DISTRIBUTION PANEL SIGNALS

9.1 INTERFACE SIGNALS (CPU)

<u>SIGNAL NAME</u>	<u>ACTIVE LEVEL</u>	<u>PIN NUMBERS</u>
Data 0	L	B62
Data 1	L	B65
Data 2	L	B82
Data 7	L	B55
Data 8	L	B60
Data 9	L	B63
Data 10	L	B75
Data 11	L	B58
Data 12	L	B59
Data 13	L	B64
Data 14	L	B56
Data 15	L	B66
DS0	L	B72
DS1	L	B68
DS2	L	A66
DS3	L	A46
DS4	L	A62
DS5	L	A64
DATIA	H	A44
DATIB	H	A42
DATIC	H	A54
DATOA	H	A58
DATOB	H	A56
DATOC	H	A48
START	H	A52
CLEAR	H	A50
INTA	H	A40
IOPLS	H	A74
IORST	H	A70

9.1 INTERFACE SIGNALS (CPU) (continued)

MASKO	L	A38
RQENB	L	B41
INTR	L	B29
SELB	L	A82
SELD	L	A80
INTP-IN	L	A96
INTP-OUT	L	A95
DCHP-IN	L	A94
DCHP-OUT	L	A93

9.2 INTERFACE SIGNALS (DCU)

<u>SIGNAL NAME</u>	<u>ACTIVE LEVEL</u>	<u>PIN NUMBER</u>
DDATA 0	L	A69
DDATA 1	L	A75
DDATA 2	L	A91
DDATA 7	L	A47
DDATA 8	L	A65
DDATA 9	L	A71
DDATA 10	L	A78
DDATA 11	L	A61
DDATA 12	L	A63
DDATA 13	L	A73
DDATA 14	L	A57
DDATA 15	L	A67
DDS0	L	B13
DDS1	L	B19
DDS2	L	B23
DDS3	L	B51
DDS4	L	B27
DDS5	L	B25
DDATIA	H	B52
DDATIB	H	B53
DDATIC	H	B38

9.2 INTERFACE SIGNALS (DCU) (continued)

<u>SIGNAL NAME</u>	<u>ACTIVE LEVEL</u>	<u>PIN NUMBER</u>
DDATOA	H	B34
DDATOB	H	B36
DDATOC	H	B49
DSTART	H	B40
DCLEAR	H	B48
DINTA	H	B54
DIOPLS	H	B11
DIORST	H	B15
DMASKO	L	B67
DRQENB	L	A49
DINTR	L	A86
DSELB	L	A90
DSELD	L	B6
DINTP-IN	L	A87
DINTP-OUT	L	A89

COMMON SIGNALS:

PRI-IN	H	A84
PRI-OUT	H	A83

9.3 DISTRIBUTION PANEL RIBBON CABLE SIGNALS

<u>SIGNAL NAME</u>	<u>PIN NUMBER</u>
GROUND	1
20MA/EIA XMT-DATA-9	2
20MA/EIA RCV-DATA-9	3
EIA CTS-9	4
20MA/EIA XMT-DATA-10	5
20MA/EIA RCV-DATA-10	6
EIA CTS-10	7

<u>SIGNAL NAME</u>	<u>PIN NUMBER</u>
20MA/EIA XMT-DATA-11	8
20 MA/EIA RCV-DATA-11	9
EIA CTS-11	10
EIA CTS-12	11
20MA/EIA RCV-DATA-12	12
20MA/EIA XMT-DATA-12	13
EIA CTS-8	14
20MA/EIA RCV-DATA-8	15
20MA/EIA XMT-DATA-8	16
20MA/EIA-XMT-DATA-2	17
20MA/EIA RCV-DATA-2	18
EIA CTS-2	19
20MA/EIA XMT-DATA-1	20
20MA/EIA RCV-DATA-1	21
EIA CTS-1	22
20MA/EIA XMT-DATA-0	23
20MA/EIA RCV-DATA-0	24
EIA CTS-0	25
20MA/EIA XMT-DATA-15	26
20MA/EIA RCV-DATA-15	27
EIA CTS-15	28
20MA/EIA XMT-DATA-14	29
20MA/EIA RCV-DATA-14	30
EIA CTS-14	31
20MA/EIA XMT-DATA-13	32
20MA/EIA RCV-DATA-13	33
EIA CTS-13	34
20MA/EIA XMT-DATA-3	35
20MA/EIA RCV-DATA-3	36
EIA CTS-3	37

9.3 DISTRIBUTION PANEL RIBBON CABLE SIGNALS (continued)

<u>SIGNAL NAME</u>	<u>PIN NUMBER</u>
20MA/EIA XMT-DATA-4	38
20MA/EIA RCV-DATA-4	39
EIA CTS-4	40
20MA/EIA XMT-DATA-7	41
20MA/EIA RCV-DATA-7	42
EIA CTS-7	43
20MA/EIA XMT-DATA-5	44
20MA/EIA RCV-DATA-5	45
EIA CTS-5	46
20MA/EIA XMT-DATA-6	47
20MA/EIA RCV-DATA-6	48
EIA CTS-6	49
-5V-20MA RCV-RETURN	50

9.4 DISTRIBUTION PANEL, 25 PIN CONNECTORS

(All Connectors are the same for lines 0-15)

<u>PIN NUMBER</u>	<u>SIGNAL NAME</u>
1	Not Used
2	20MA/EIA XMT-DATA
3	20MA/EIA RCV-DATA
4	Not Used
5	EIA CTS
6	Not Used
7	GROUND/20MA-XMT RETURN
8-12	Not Used
13	-5V/20MA-RCV RETURN
14-25	Not Used

10.0 APPLICATION INFORMATION

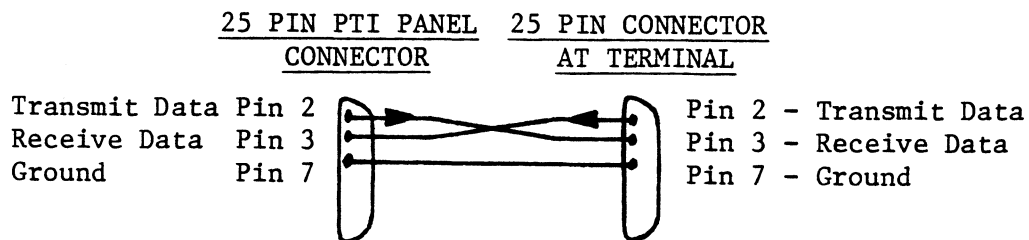
10.1 GENERAL

Devices may be attached directly to the PTI board via the Distribution Panel. The Distribution Panel contains 16-25 pin EIA female connectors, one for each line. Both EIA RS-232C and 20MA current loop interfaces are provided for each line. Clear to Send (CTS) is also supported to provide a means of handshaking between the PTI and a Peripheral. The following Sections depict the PTI being used in several applications, including the use of the Multiple PTI boards in a single system.

10.2 RS232C TERMINAL

Terminals which have an RS232C interface may be directly connected to the PTI board's Distribution Panel. However, care must be taken to insure that the Receivers and Transmitters are properly connected and the line on the PTI being used is in EIA Mode (see Section 7.2).

Since Transmit Data flows out from the PTI on Pin 2 of each 25 pin connector, this should go to the Receiver Input of the terminal which is normally Pin 3. The terminal sends data out on Pin 2 of its 25 pin connector and the PTI expects that data to be present on Pin 3 of the 25 pin connector on the Distribution Panel. This hook-up is shown below:



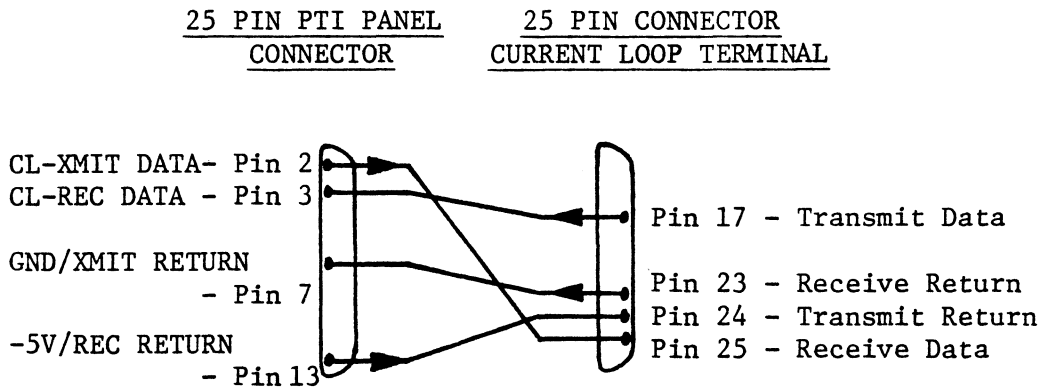
The cable should have the following Internal Connections:

Pin 2 (PTI End)	to	Pin 3 (Terminal End)
Pin 3 (PTI End)	to	Pin 2 (Terminal End)
Pin 7 (PTI End)	to	Pin 7 (Terminal End)

10.3 CURRENT LOOP TERMINALS

Terminals using the Current Loop Interface may also be used with the PTI. This hook-up requires the line being used to be set to Current Loop Mode (see Section 7.2) and an interface cable which provides return loops for the transmitter and receiver. The terminal being used should have a "Passive" interface, meaning the PTI provides the current for the drivers and receivers. Since each half of the interface requires a complete loop for the current to flow, a different wiring scheme from RS232C must be employed.

Transmit Data flows out of the PTI board on Pin 2 of the 25 pin connector and returns on Pin 7, thus completing the transmit loop. The Receive Data Loop is similar, data flows into the PTI on Pin 3 and uses Pin 13 as a return path. A typical current loop cable configuration is shown below:



The cable should have the following Internal Connections:

- | | | |
|------------------|----|-----------------------|
| Pin 2 (PTI End) | to | Pin 25 (Terminal End) |
| Pin 3 (PTI End) | to | Pin 17 (Terminal End) |
| Pin 7 (PTI End) | to | Pin 23 (Terminal End) |
| Pin 13 (PTI End) | to | Pin 24 (Terminal End) |

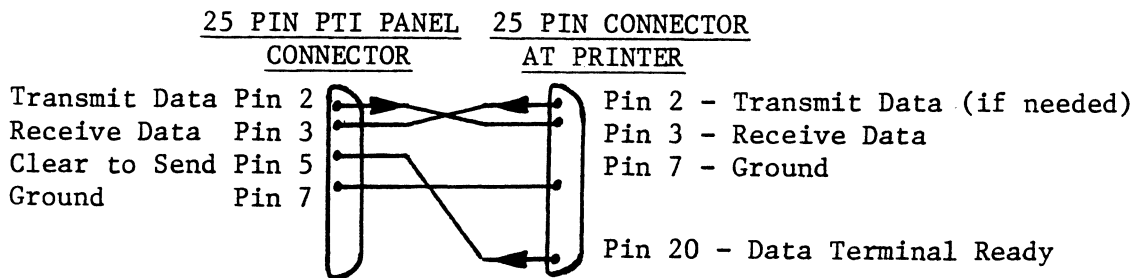
10.4 SERIAL PRINTER CONNECTION

When attaching Serial Interface Printers to the PTI, a means of starting and stopping the flow of characters must be provided. Since most printers can only buffer a line or a page of information, the CPU must be signaled to prevent characters from being lost. This signaling method is called Handshaking.

This Handshaking process is achieved by connecting the Ready, Busy or "Data Terminal Ready" signal of the printer to the "Clear to Send" input of the line being used. Typically, these signals are at an active "High" level (+3.5 to +12V) whenever the printer can accept data and low (+.4V to -12V) when its buffer is full. This signal may go low at any time during the last character the printer can accept without causing any lost data.

Two examples of this "Handshaking" interface are shown below:

DIABLO HYTERM* MODEL 1610



The cable should have the following Internal Connections:

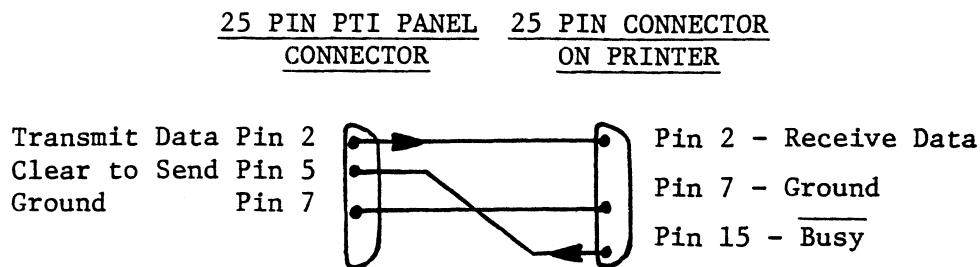
Pin 2 (PTI End)	to	Pin 3 (Printer End)
Pin 3 (PTI End)	to	Pin 2 (Printer End)
Pin 5 (PTI End)	to	Pin 20 (Printer End)
Pin 7 (PTI End)	to	Pin 7 (Printer End)

*Hyterm is a trademark of Diablo Systems, Inc.

10.4 SERIAL PRINTER (continued)

General Electric Terminet** Printers

The Terminet** Printer interfaces easily to the PTI Board. However, for best results the Busy Signal must be jumpered for an active low level and switch in the middle of the parity bit. The electrical connections are shown below:



The cable should have the following Internal Connections:

Pin 2 (PTI End)	to	Pin 2 (Printer End)
Pin 5 (PTI End)	to	Pin 15 (Printer End)
Pin 7 (PTI End)	to	Pin 7 (Printer End)

**Terminet is a trademark of General Electric, Inc.

10.5 USING MULTIPLE PTI BOARDS

In Systems which require more than 16 Serial Interfaces, two or more PTI boards may be cascaded to provide a maximum of 256 total lines (a physical limitation only - the System limit may be less). This is achieved by setting the Line Address for the next highest group of sixteen on the second board, and the same for the third board (see Section 4.0) and so on. The boards should be placed in the chassis with the highest priority board (usually lines 0-15) closest to the CPU, with the next highest priority board in the next slot and etc. An Inter-Board Priority Jumper must be added to establish the DINA Priority scheme as follows:

10.5 USING MULTIPLE PTI BOARDS (continued)

Jumper Pin A83 (PRI-OUT) of the higher priority board to Pin A84 (PRI-IN) of the lower priority board, repeat for as many PTI boards that are in the System.

NOTE: In the above configuration, Transmitters on Board 0-15 have a higher priority than the Receivers on subsequent boards. This can cause excessive overrun errors on the Low Priority Receivers.


```

01 ;
02 ;
03 ;
04 ;
05 ;
06 ;*****
07 ;
08 ;
09 ; DESCRIPTION: 16 CHANNEL PROGRAMABLE TERMINAL INTERFACE (PTI) DIAGNOSTIC
10 ;
11 ;
12 ; CUSTOM SYSTEMS INC, 1981
13 ;*****

```

15 .TITL PTID

000001 .DUSR X=1

16 000001 .NOMAC X

17 ;1. PROGRAM NAME PTID. SR

```

18 ;
19 ;2. REVISION HISTORY
20 ;

```

REV.	DATE	
00	07/08/81	
01	09/16/81	;TEXT CORRECTIONS, STARTING LINE ADDR 0-240

```

24 ;
25 ;3. MACHINE REQUIREMENTS:
26 ;3.1 NOVA/ECLIPSE FAMILY PROCESSOR
27 ;3.2 16K READ/WRITE MEMORY
28 ;3.3 CONSOLE DEVICE
29 ;3.4 PROGRAMABLE TERMINAL INTERFACE (PTI)
30 ;3.5 16 TEST PLUGS

```

```

31 ;
32 ;3.6 OPTIONAL HARDWARE SUPPORTED:
33 ; DCU 50 OR DCU 200(DCU TO PTI BACKPLANE JUMPER PLUG REQUIRED)
34 ;

```

```

35 ;
36 ;
37 ;4.0 TEST REQUIREMENTS
38 ; JUMPER PLUGS REQUIRED FOR FULL TEST, NO
39 ; PLUGS NEEDED FOR BRAUD TEST ONLY.
40 ;

```

```

41 ;5. SUMMARY
42 ; THE PTI DIAGNOSTIC PERFORMS A GATE BY GATE TEST OF THE PTI CONTROLLER.
43 ; THE TEST INCLUDES MOST OF THE LOGIC(CURRENT LOOP IS NOT TESTED)
44 ; ON THE 15X15 INCH ASYNCHRONOUS BOARD. THE TEST IS EXE-
45 ; CUTED USING JUMPER PLUGS WHICH CONNECT LINE 0 TRANS-
46 ; MITTER TO LINE 1 RECEIVER, LINE 1 TRANSMITTER TO LINE 0
47 ; RECEIVER, LINE 2 TRANSMITTER TO LINE 3 RECEIVER, ETC.
48 ; ANOTHER TEST JUMPER ALSO CONNECTS THE CTS INPUTS TO SWITCHES ON
49 ; THE TEST PLUG TO CONTROL THE LEVEL OF THAT INPUT, THIS TEST
50 ; PLUG DOES NOT USE THE DISTRIBUTION PANEL.
51 ;

```

52 ;6. RESTRICTIONS NONE

```

01      ;7. PROGRAM DESCRIPTION/ THEORY OF OPERATION
02
03      ;7.1 THE PTI DIAGNOSTIC IS A GATE BY GATE
04      ;      TEST OF MOST OF THE CONTROLLER LOGIC. THE CONTROL
05      ;      SECTIONS ARE DONE IN THE DIAGNOSTIC MODE,
06      ;      WITH CLOCKING VIA THE IOPLS. MOST TRANSMIT/RECEIVE
07      ;      TESTS ARE DONE ON LINE. EACH ROUTINE BEGINS
08      ;      WITH AN INITIALIZING SUBROUTINE (SETUP) AND ENDS
09      ;      WITH AN ITERATION SUBROUTINE (LOOP). MOST TESTS
10      ;      ISSUE AN I/O RESET. IN SOME CASES, THIS MAY BE
11      ;      USED TO SYNC A SCOPE. IN OTHER CASES, IT MAY BE BEST
12      ;      TO SYNC ON THE CONTROLLER INSTRUCTIONS.
13
14      ;7.2 THE ORDER OF FUNCTION TESTING IS AS FOLLOWS:
15      ;      CONTROL LOGIC COMMON LOGIC TO ALL LINES, INTERRUPT
16      ;      CONTROL, DONE AND BUSY SET AND RESET, BOARD CLEAR
17      ;      (NIOC). TIMING LOGIC - CHECKS SCANNER BY USING IO
18      ;      PULSE TO STEP THROUGH EACH TIME STATE AND LINE ADD-
19      ;      RESS, AND CORRECT TIMING OF EACH BAUD CLOCK, USING
20      ;      LINE 0 TRANSMIT CLOCK OUTPUT THROUGH BIT 7 OF DIC
21      ;      WORD (DIAGNOSTIC MODE).
22      ;      TRANSMITTER/RECEIVER TESTING- ALL BAUD CLOCKS,
23      ;      AND ALL LINE CHARACTERISTICS (INCLUDING LOOPBACK)
24      ;      AND TRANSMIT BREAK ARE TESTED HERE, FIRST ON
25      ;      LINE 0.
26
27      ;7.3 THE TRANSMIT/RECEIVE TESTS ARE REPEATED FOR
28      ;      EACH LINE TO COMPLETE A FULL PASS.
29      ;8. OPERATING MODES/SWITCHES
30      S?MPD 8.1
31      0?DTD 8.2
32
33      ;9. OPERATING PROCEDURE
34      ;9.1 TURN POWER OFF
35      ;9.1.1 SET ALL LINES TO CURRENT LOOP
36      ;9.1.2 CONNECT TEST PLUGS
37      ;9.1.3 TURN POWER ON
38      ;9.2 LOAD THE PROGRAM
39      ;9.3 SET SWITCHES TO 000200 (RESTART ONLY)
40      ;9.4 PRESS START (RESTART ONLY)
41
42      ;9.4.1 THE PROGRAM WILL RESPOND BY REQUESTING THE OPERATOR
43      ;      TO TYPE 1 TO RUN BAUD RATE TEST ONLY. THE OPERATOR
44      ;      MUST TYPE A 1 TO RUN BAUD RATE ONLY, TYPING ANYTHING
45      ;      ELSE WILL CAUSE PROGRAM TO ASSUME FULL TEST IS DESIRED.
46
47      ;9.4.2 THE PROGRAM WILL NEXT ASK THE OPERATOR
48      ;      TO TYPE THE DEVICE CODE. A 2 DIGIT OCTAL NUMBER FOL-
49      ;      LOWED BY A CARRIAGE RETURN IS EXPECTED. THIS NUMBER
50      ;      SHOULD CORRESPOND TO THE PTI CONTROLLER DEVICE CODE
51      ;      (EITHER 34 OR 44).
52      ;9.4.3 THE PROGRAM WILL NEXT ASK THE OPERATOR TO TYPE THE
53      ;      ADDRESS OF THE FIRST LINE (IN DECIMAL). THIS IS THE
54      ;      *RIGHT JUSTIFIED*(!) BOUNDARY ADDRESS AS DEFINED BY
55      ;      SWITCH SETTINGS ON TEST PLUG; (0,16,32...240) CONSULT
56      ;      CONFIGURATION SHEET. TYPE DECIMAL ADDRESS OF FIRST
57      ;      LINE AND CARRIAGE RETURN.
58      ;
59
60      ;9.4.4 THE PROGRAM WILL ASK IF THERE IS A DCU IN SYSTEM

```

01 ; TYPE A 1 OTHERWISE 0. IF A ONE IS TYPED THE PROG
02 ; WILL FIRST REQUEST THE OPERATOR TO TYPE THE DCU
03 ; DEVICE CODE. A 2 DIGIT OCTAL NUMBER FOLLOWED BY A
04 ; CARRIAGE RETURN IS EXPECTED. THIS NUMBER SHOULD
05 ; CORRESPOND TO THE DCU DEVICE CODE (ANY NUMBER
06 ; FROM 1 TO 76 OCTAL).
07 ;
08 ;
09 ; 9.5 WHEN OPERATOR INPUT IS COMPLETE, EXECUTION OF THE
10 ; TEST PROGRAM BEGINS. THE FIRST PASS THROUGH THE
11 ; PROGRAM WILL PRODUCE A LISTING OF THE BAUD RATE
12 ; OF CLOCKS 0 THROUGH 3. CONSULT THE HARDWARE
13 ; INSTALLATION INSTRUCTIONS IF THESE ARE TO BE
14 ; CHANGED. RESTARTING THE PROGRAM WILL REPEAT
15 ; THE BAUD PRINTOUT.
16 ;
17 ; WHEN ALL LINES ARE TESTED, THE WORD "PASS" WILL BE TYPED
18 ; ON THE CONSOLE DEVICE.
19 ;
20 ; 9.6 RESTART PROCEDURE
21 ; THE PROGRAM MAY BE RESTARTED AT 200 FOR REPEAT
22 ; EXECUTION. THIS MAY BE DONE MANUALLY OR VIA ^ R
23 ; OR ^D.
24 ;
25 ; IF THE PROGRAM IS RUNNING IN A DCU THE RESET
26 ; SWITCH MUST BE PRESSED TO RESTART MANUALLY AT
27 ; 200. ALSO TWO ^R'S OR ^D'S ARE REQUIRED TO
28 ; BRING THE HOST BACK. THE FIRST CONTROL R OR D
29 ; WILL PUT THE MACHINE IN A SPECIAL SWITCH INPUT
30 ; MODE WHERE THE SWITCHES MAY BE SET OR EXAMINED
31 ; USING THE "M" COMMAND.
32 ;
33 ; 9.6.1 THE MESSAGE TYPE 1 FOR NEW PARAMETERS WILL APPEAR
34 ; ON RESTART. TYPING A 1 WILL PRODUCE ALL OF THE
35 ; QUESTIONS INITIALLY ANSWERED. TYPING ANY OTHER
36 ; CHARACTER WILL BEGIN TESTS USING THE PREVIOUSLY
37 ; GIVEN PARAMETERS.
38 ;
39 ; 9.7 CTS TESTING
40 ; FOR INITIAL TESTING, IF USING TEST PLUG WITH SWITCHES, ALL SWTS
41 ; SHOULD BE ON. AFTER SUCCESSFULLY RUNNING THE DIAGNOSTIC,
42 ; THE CTS LINES MAY BE INDIVIDUALLY TESTED BY TURNING OFF ITS
43 ; ASSOCIATED SWITCH ON THE TEST PLUG. (ONLY ONE SWITCH SHOULD
44 ; BE OFF AT A TIME)
45 ; A FLAGGED ERROR MESSAGE WILL IDENTIFY THE CTS LINE THAT
46 ; HAS BEEN DISABLED. TO TEST OTHER LINES, SWITCH TESTED LINE ON,
47 ; DISABLE NEXT LINE, AND RESTART PROGRAM. (CONTROL D)
48 ;
49 ; 10. PROGRAM OUTPUT/ERROR DESCRIPTION
50 ; 10.1 IF A MALFUNCTION IS DETECTED, THE PROGRAM WILL CYCLE
51 ; IN A SCOPE LOOP IN ACCORDANCE WITH THE SWITCHES.
52 ; PROGRAM WILL PRINT THE LINE NUMBER BEING TESTED
53 ; AT THAT TIME (PRIME LINE), AND IF TRANSMITTING AND
54 ; RECEIVING USING 2 DIFFERENT LINES, "PRIME LINE" WILL
55 ; BE THE TRANSMITTING LINE, AND "SECONDARY LINE"
56 ; WILL BE THE RECEIVER LINE ADDRESS.
57 ; 10.2 WHEN THE PROGRAM IS IN A SCOPE LOOP SETTING, SWITCH 3(1)
58 ; WILL CAUSE THE FAILURE RATE TO BE PRINTED. SETTING
59 ; SWITCH 1(1) WILL CAUSE THE PROGRAM TO PROCEED TO
60 ; THE NEXT TEST.

```

0004 PTID
01 ;
02 ;
03 ;11  DEBUG HELP
04 ;
05 ;11.1  DESCRIPTION OF COMMUNICATION SYSTEM I/O FUNCTIONS:
06 ;
07 ;11.1.1 DEVICE CODE MUX = 34 (OCTAL)
08 ;
09 ;
10 ;11.1.2 DOR AC, MUX  SPECIFIES THE ABSOLUTE LINE ADDRESS TO
11 ;                     BE USED IN CONJUNCTION WITH A DATA OUT
12 ;                     INSTRUCTION TO TRANSMIT OR RECEIVE.
13 ;
14 ;                     BITS 0-6      NOT USED
15 ;
16 ;                     BITS 7-14    ABSOLUTE LINE ADDRESS
17 ;
18 ;                     0=RECEIVE CONTROL
19 ;                     1=TRANSMIT CONTROL
20 ;
21 ;11.1.3 DOB AC, MUX  SPECIFIES TRANSMIT DATA OR TRANSMIT MODE
22 ;                     (TRANSPARENT OR BREAK).
23 ;
24 ;                     BITS 0-1      TRANSMIT CONTROL
25 ;                     10=NOT USED
26 ;                     00=NORMAL TRANSMIT DATA
27 ;                     01=TRANSMIT BREAK(ASYNC ONLY)
28 ;
29 ;                     BITS 2-7      NOT USED
30 ;
31 ;                     BITS 8-15    TRANSMIT DATA (IN TRANSMIT MODE)
32 ;
33 ;
34 ;11.1.4 DOC AC, MUX  SPECIFIES ON/OFF CONTROL OF TRANSMITTER
35 ;                     OR RECEIVER, OUTPUT LINE CHARACTER-
36 ;                     ISTICS.
37 ;
38 ;
39 ;                     BITS 0-1      00=XMIT/RECV CONTROL
40 ;
41 ;                     BITS 2-14    NOT USED
42 ;
43 ;                     BIT 15      0=OFF
44 ;                     1=ON
45 ;
46 ;
47 ;
48 ;                     BITS 0-1      10= SPECIFIES PARITY, STOP BITS,
49 ;                     LINE SPEED, CHAR CODE LEVEL, AND
50 ;                     LOOPBACK CONTROL.
51 ;
52 ;                     BITS 2-6      NOT USED
53 ;
54 ;                     BITS 7-8      CLOCK SELECT
55 ;
56 ;                     00 = CLOCK 0
57 ;                     01 = CLOCK 1
58 ;                     10 = CLOCK 2
59 ;                     11 = CLOCK 3
60 ;

```

0005 PTID

01	;	BITS 9-10	SPECIFY NUMBER OF STOP BITS
02	;		
03	;		
04	;		00 = 1 STOP BIT
05	;		01 = 2 STOP BITS
06	;		10 = RESERVED
07	;		11 = RESERVED
08	;		
09	;	BITS 11-12	SPECIFY CODE LEVEL
10	;		
11	;		00 = 5 LEVEL CODE
12	;		01 = 6 LEVEL CODE
13	;		10 = 7 LEVEL CODE
14	;		11 = 8 LEVEL CODE
15	;		
16	;	BITS 13-14	PARITY SELECT
17	;		
18	;		00 = NO PARITY
19	;		01 = ODD PARITY
20	;		10 = EVEN PARITY
21	;		11 = RESERVED
22	;		
23	;	BIT 15	LOOPBACK CONTROL
24	;		
25	;		0 = LOOPBACK OFF
26	;		1 = LOOPBACK ON
27	;	11.1.5 DIA AC, MUX	SPECIFIES IMPLICIT ADDRESS OF INT-
28	;		ERRUPTING LINE, RECEIVE, OR
29	;		TRANSMIT, AND FORCES A DOR AS EXPLICIT
30	;		ADDRESS FOR OUTPUTTING.
31	;		
32	;		
33	;	BITS 0-6	NOT USED
34	;		
35	;	BITS 7-14	EXPLICIT ADDRESS
36	;		
37	;	BIT 15	TRANSMIT OR RECEIVE CONTROL
38	;		
39	;		0= RECEIVE INTERRUPT
40	;		1= TRANSMIT INTERRUPT
41	;		
42	;		
43	;	11.1.6 DIB AC, MUX	SPECIFIES RECEIVED DATA ON RECEIVE INT-
44	;		ERRUPT.
45	;		
46	;	BITS 0-7	NOT USED
47	;		
48	;	BITS 8-15	RECEIVE DATA
49	;		
50	;		
51	;	11.1.7 DIC AC, MUX	SPECIFIES RECEIVER DONE/STATUS
52	;		
53	;	BITS 0-11	NOT USED
54	;		
55	;		
56	;		RECEIVER STATUS
57	;		
58	;	BIT 12	FRAMING ERROR
59	;		
60	;	BIT 13	PARITY ERROR

```

01 ;
02 ; BIT 14 OVERRUN
03 ;
04 ; BIT 15 0=RECEIVER STATUS
05 ; 11.1.8 EFFECT OF 'BUSY' AND 'DONE' ON COMMUNICATIONS CONTROL
06 ;
07 ;
08 ; BUSY: BUSY IS SET ON THE ASYNC LINES ON AN I/O RESET
09 ; OR START PULSE. THIS STARTS AN ICLR CYCLE WHICH
10 ; PRESETS THE SCAN ADDRESS
11 ; COUNTER. ON COMPLETION OF THE ICLR CYCLE,
12 ; BUSY RESETS, AND THE BOARD IS PLACED IN THE
13 ; 'DIAGNOSTIC' MODE.
14 ;
15 ; DONE: DONE SETS ON LINES WHEN ONE
16 ; OF THE FOLLOWING EVENTS OCCURS:
17 ; 1. CHARACTER RECEIVED.
18 ; 2. TRANSMIT BUFFER EMPTY
19 ; INTERRUPTS OCCUR IN THE ABOVE ORDER OF PRIORITY,
20 ; AND FROM LOWEST TO HIGHEST NUMBERED LINES. A
21 ; 'NIOC MUX' WILL CLEAR DONE, AS WELL AS A
22 ; 'NIO5 MUX' AND 'IORST'.
23 ;
24 ; IORESET: CLEARS LOGIC AND PLACES CONTROLLERS IN OFFLINE
25 ; DIAGNOSTIC MODE. ALSO SETS 'BUSY' (ASYNC ONLY).
26 ;
27 ; START: SAME AS IORESET .
28 ;
29 ; CLEAR: CLEARS 'DONE' AND INTERRUPT LOGIC AND PLACES
30 ; CONTROLLERS IN ONLINE MODE.
31 ;
32 ; IOPLS(MUX): STEPS INTERNAL CLOCKS IN
33 ; 'DIAGNOSTIC' MODE.
34 ;
35 ;
36 ; 12 SPECIAL NOTES/SPECIAL FEATURES
37 ; 12.1 IF THE ASYNC CONTROLLER IS BEING RUN VIA A DCU, ALL
38 ; CODE WILL BE EXECUTED BY THE DCU, AND THE DCU WILL
39 ; TRANSFER CONTROL OF THE PROGRAM TO THE MAIN PROCESSOR
40 ; FOR ALL OPERATOR AND CONSOLE INTERFACING
41 ;
42 ;
43 ; ; NOTE: THE DCU DIAGNOSTIC AND EXERCISER SHOULD BE ;
44 ; ; RUN PRIOR TO RUNNING THIS PROGRAM TO INSURE ITS ;
45 ; ; RELIABILITY ;
46 ; ;
47 ;
48 ; IF THE CONTROL 0 INPUT IS MADE TO TRANSFER
49 ; CONTROL TO THE HARDWARE ODT IN A DCU SYSTEM
50 ; THE ODT IS EXECUTED FROM THE DCU AND WILL REFERECE
51 ; DCU LOCAL MEMORY. AVOID RESTARTING THE PROGRAM
52 ; WITH A 200R COMMAND IN THIS CASE AS THE DCU WILL
53 ; BE EXECUTING THE INITIAL CODE NOT INTENDED FOR ITSELF
54 ; AND WILL PRODUCE THE "UNANTICIPATED DCU HALT"
55 ; MESSAGE.
56 ;
57 ; 12.2 IN THE EVENT OF SUCCESSFUL OPERATION OF THIS TEST, THE
58 ; COMMUNICATIONS RELIABILITY TEST SHOULD BE
59 ; RUN IF A PROBLEM STILL EXISTS.
60 ; 12.3 DON'T RUN TEST ROUTINES OUT OF SEQUENCE, AS A TEST MAY

```

0007 PTID

```

01 ; REQUIRE SCRATCH PAD DATA OR SETUP SEQUENCING FROM A
02 ; PREVIOUS TEST. AFTER A POWER DOWN, RESTART THE PROG-
03 ; RAM FROM THE BEGINNING.
04 ;12.4 THE FOLLOWING FUNCTIONS ARE NOT TESTED BY THIS PROGRAM:
05 ; INTERRUPT PRIORITY AND MUX DEVICE PRIORITY.
06 ;12.5 THE FOLLOWING IS A TABLE OF THE
07 ; FREQUENCIES FOR BAUD CLOCKS
08 ; AND THE SWITCH SETTING REQUIRED
09 ; BY THE DIAGNOSTIC:
10
11 ;          CLK 1,3      5 6 7 8
12 ; BAUD RATE  CLK 0,2    1 2 3 4      0=CLOSED 1=OPEN
13 ;
14 ;          50           0 0 0 0
15 ;          75           1 0 0 0
16 ;          110          0 1 0 0
17 ;          134.5        1 1 0 0
18 ;          150           0 0 1 0
19 ;          300           1 0 1 0
20 ;          600           0 1 1 0
21 ;          1200          1 1 1 0
22 ;          1800          0 0 0 1
23 ;          2000          1 0 0 1
24 ;          2400          0 1 0 1
25 ;          3600          1 1 0 1
26 ;          4800          0 0 1 1
27 ;          7200          1 0 1 1
28 ;          9600          0 1 1 1
29 ;          19.2K        1 1 1 1
30 ;
31 ;12.6 ON ALL INPUT REQUESTS THE OPERATOR MAY ELECT
32 ; TO ALTER FLOW OF THE PROGRAM BY STRIKING A
33 ; CONTROL O, R OR D.
34 ;
35 ;13. RUNTIME DEPENDS UPON THE BAUD RATE OF CLK 0, WITH
36 ; 19.2K BAUD AS CLOCK 0, WILL PRINT PASS IN LESS
37 ; THAN 3 MINUTES.
38 ;MACROS
39 000003 .DUSR I=3          ;# OF INTERACTIONS PER TEST
40 000001 .DUSR P=1          ;# OF TIMES THROUGH DIAG FOR PASS
41
42 .MACRO CLOCK
43     LDA    0,C~1
44     JSR    @ICONT
45 %
46
47 .MACRO SDONE
48     ADROUT
49     LDA    0,K400          ;SET "DONE" FLOP
50     DOC    0,MUX          ;ARTIFICIALLY
51 %
52
53 .MACRO RICLR
54     ADROUT                ;RESET ICLR TO
55     SUB    0,0            ;ENABLE "DONE" AND
56     DOC    0,MUX          ;RESET "BUSY"
57 %
58
59 .MACRO ADROUT
60     LDA    2,BDADR        ;ADDRESS CORRECT

```

```

0008 PTID
01          DOR      2, MUX          ; BOARD
02          %
03          .MACRO  LINE
04          ADROUT
05          LDA      1, CM^1
06          CLOCK   32              ; FULL CYCLE
07          INC      1, 1, SZR
08          JMP      .-3
09          %
10
11          .MACRO  TIM6
12          ADROUT                  ; PAST TIM2 LATCHING AND TIM6
13                                ; DONE SETTING PULSES
14          CLOCK   31
15          TCYCLE  ^1
16          %
17
18          .MACRO  TIM2A
19          CLOCK   14
20          %
21
22          .MACRO  TIM2B
23          CLOCK   22
24          %
25
26          .MACRO  LCS
27          JSR      @, LINC          ; OUTPUT LINE CHARACTERISTICS
28          100000+^1+^2+^3+^4+^5
29          %
30
31          .MACRO  TIM2
32          ADROUT
33          CLOCK   26              ; RUN COUNTER PAST TIM2 LATCHING PULSE,
34          TCYCLE  ^1              ; BUT BEFORE TIM6 OF
35                                ; ^1
36          %
37
38          .MACRO  TCYCLE
39          ADROUT
40          LDA      1, ^1          ; CYCLE TIME STATE
41          INC      1, 1, SNR      ; COUNTER TO BEGINNING
42          JMP      .+4            ; OF ^1
43          CLOCK   32
44          JMP      .-4
45          %
46          .MACRO  RECEIVER
47          LDA      0, OADR
48          DOR      0, MUX          ; ENABLE RECEIVER
49          SUBZL   1, 1
50          DOC      1, MUX          ; START RECEIVER
51          %
52
53          .MACRO  TRANSMIT
54          INC      0, 0            ; ENABLE TRANSMITTER
55          DOR      0, MUX
56          SUB      0, 0            ; TURN OFF TRANSMITTER
57          DOC      0, MUX
58          LCS      ^1, ^2, ^3, ^4, ^5
59          %
60

```


0009 PTID

```
01 .MACRO DATACHECK
02 JSR@ . CLR
03 LDA 1, C^1 ; OUTPUT ONE WORD
04 DOB 1, MUX
05 SKPDN MUX ; WAIT FOR RECEIVER COMPLETE
06 JMP . -1
07 DIB 0, MUX
08 SUB# 1, 0, SZR ; DOES RECEIVE WORD MATCH?
09 EHALLT ; NO, CHECK UAR/T
10 LOOP
11 %
12
13 .MACRO RECVIN
14 LDA 0, RECADR ; TURN ON MATED RECEIVER
15 DOA 0, MUX
16 LCS ^1, ^2, ^3, ^4, ^5
17 SUBZL 0, 0 ; START RECEIVER
18 DOC 0, MUX
19 LDA 0, QUADR
20 %
21 .MACRO STATUS
22 JSR@ . CLR ; ONLINE WITH NIOC & DELAY FOR BAUD RATE
23 LDA 1, C^1 ; TRANSMIT DATA
24 DOB 1, MUX
25 SKPDN MUX
26 JMP . -1
27 DIC 0, MUX ; INPUT STATUS WORD
28 LDA 1, C^2 ; LOAD MASK
29 AND# 1, 0, ^3 ; CHECK STATUS
30 EHALLT ; CHECK UAR/T PAIR
31 LOOP
32 %
33
34
35 .MACRO SCAN
36 JSR@ IENT? ; CHECK SCAN #^1
37 I
38 IORST
39 JSR@ IDELA
40 LINE ^1
41 SDONE
42 DIA 0, MUX
43 LDA 1, BMASK
44 AND 1, 0
45 LDA 1, C^2
46 ADD 1, 2
47 SUB# 2, 0, SZR ; IS SCAN ^1?
48 EHALLT ; NO, CHECK SCAN
49 LOOP ; ADDRESS COUNTER
50 %
51 .MACRO DATAOUT
52 JSR@ IENT?
53 I
54 IORST
55 JSR@ IDELA
56 RECEIVER
57 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
58 JSR@ . CLR ; ONLINE & DELAY FOR BAUD RATE
59 LDA 1, C^1 ; OUTPUT WORD
60 DOB 1, MUX
```

0010 PTID

```
01          SKPDN  MUX          ;WAIT FOR RECEIVE WORD
02          JMP    .-1
03          DIB    0, MUX       ; INPUT RECEIVE DATA
04          SUB#   1, 0, SZR     ; DOES DATA MATCH?
05          EHFLT
06          LOOP
07          %
08
09          .MACRO  DIAG
10          LDA    0, C200      ; ISSUE CLEAR WITHOUT
11          DOC    0, MUX       ; GOING ON LINE
12          %
```

!0011 PTID

01	000000	.NOMAC	0	
02	000000	.LOC	0	
03	000000	000002	2	
04	000001	000010	10	
05	000002	000200	DT0?S	
06	000003	002002	JMP	0. -1
07	000010	.LOC	10	
08	00010	002000	JMP	00 ; INTERRUPT RTN
09				
10				
11	000045	.LOC	45	
12	00045	012175	EGGS	; DO NOT INSERT, LOC 45
13				; CONTAINS EGGS POINTER
14				
15	000060	.LOC	60	
16		; CONSTANTS		
17				
18	000000	NLOOP=	0	
19	000001	LOOPBACK=	1	
20	000000	NOPARITY=	0	
21	000002	ODDPARITY=	2	
22	000004	EVENPARITY=	4	
23	000000	CODE5=	0	
24	000010	CODE6=	10	
25	000020	CODE7=	20	
26	000030	CODE8=	30	
27	000000	ONESTOP=	0	
28	000040	TWOSTOP=	40	
29	000000	CL0=	0	
30	000200	CL1=	200	
31	000400	CL2=	400	
32	000600	CL3=	600	
33	000034	.DUSR	MUX=34	
34	000076	.DUSR	DCU= 76	
35				
36	00060	000774	AMASK:	774
37	00061	000776	BMASK:	776
38	00062	063500	.SKIP:	SKPBZ 0
39	00063	000400	K400:	400
40	00064	100001	LON:	100001 ; LOOPBACK ON
41				
42		; VARIABLES		
43				
44	00065	000000	AC0??:	0
45	00066	000000	AC1??:	0
46	00067	000000	AC2??:	0
47	00070	000000	AC3??:	0
48	00071	000000	BDADR:	0
49	00072	000000	CLK0:	0
50	00073	000000	CLK1:	0
51	00074	000000	CLK2:	0
52	00075	000000	CLK3:	0
53	00076	000000	PRS2:	0
54	00077	000000	PRS3:	0
55	00100	000000	TEM:	0
56	00101	000034	DEVCD:	MUX
57	00102	000000	NLINE:	0 ; 0(0-15)
58	00103	000076	DCODE:	DCU
59	00104	000000	PRIMLINE:	0 ; NEGATIVE
60	00105	000000	QUADR:	0

```

0012 PTID
01 00106 000000 RECADR:      0
02 00107 000000 SECLINE:      0          ;NEGATIVE
03 00110 000000 TEMP:         0
04 00111 000000 THING:         0
05 00112 000000 WATE:         0
06 00113 000000 YES:          0          ;DCU SWITCH
07 00114 000000 DCUL:         0
08          ;ADDRESSES
09
10 00115 006737 .LINCH: LINCH
11 00116 011746 .MUL:  MUL?
12 00117 006764 ICONT:  CONT
13 00120 007014 IDELAY:  WTBSY
14 00121 010327 IDCHNG:  DCHNG
15 00122 006773 IDEL:    DEL
16 00123 006771 IDELI:  DELI
17 00124 006774 IDEL1:  DEL+1
18 00125 006751 ISUBX:  SUBX
19 00126 006752 ISUBY:  SUBY
20 00127 006753 ISUBZ:  SUBX+2
21 00130 000000 BDCKK:  0
22 00131 007011 .CLR:    CLR
23 00132 000401 .WHAT:  WHAT
24 00133 010240 IDCRES:  DCRES          ;DCU ESCAPE R
25          P?G0U  BEG1, K, J, P, 200, 70000, P
26          000000 .DUSR  COM?P=0
27          000200 .LOC   200
28
29 00200 002202 DT0?SB:  JMP  @BGN?ADR      ;START PROGRAM HERE
30 00201 000000 HEL?P:  0          ;CURRENT TEST ADDRESS
31 00202 000402 BGN?ADR:  BEG1          ;PROGRAM STARTING ADDRESS
32 00203 000000 PAS?S:  0          ;PASS COUNT
33 00204 000001 PA?SIN:  P          ;INTERNAL PASS COUNT
34 00205 000001 PA?SVL:  P          ;INTERNAL PASS COUNT VALUE
35
36 00206 000000 ITR?R:  0          ;ERROR SWITCH
37 00207 000000 AC3?:  0          ;PAGE ZERO LOCATION FOR AC3
38 00210 000000 ODO?K:  0          ;PAGE ZERO LOCATION FOR BREAKPOINT
39 00211 070000 ERR?4:  70000      ;DELAY TIME FOR L?OPX
40          ; PAGE ZERO POINTERS
41 00212 012175 IEGG?S:  EGGS
42 00213 012202 ISWR?EG:  SWREG        ;SWITCH REGISTER POINTER
43 00214 011572 IINP?:  INP?K        ;SWITCH PACK POINTER
44 00215 010420 IMES?S:  MES?S        ;MESSAGE PRINT ROUTINE POINTER
45 00216 010467 ICRL?F:  CRL?F        ;CR/LF PRINT ROUTINE POINTER
46 00217 010616 ITYP?E:  TYP?E        ;CHARACTER PRINT ROUTINE POINTER
47 00220 010522 IPDE?C:  PDE?C        ;DECIMAL PRINT ROUTINE POITNER
48 00221 010512 IPDC?S:  PDC?S        ;DECIMAL AND 1 CHAR PRINT ROUTINE POINTER
49 00222 010504 IPOC?T:  POC?T        ;OCTAL PRINT ROUTINE POINTER
50 00223 010500 IZOC?T:  ZOC?T        ;ZERO SUPPRESSED OCTAL PRINT ROUTINE
51 00224 010762 ITI?0:  TIN?0        ;OCTAL INPUT ROUTINE POINTER
52 00225 010766 ITI?D:  TIN?D        ;DECIMAL INPUT ROUTINE POINTER
53 00226 011612 IENT?R:  ENT?R        ;ENTER ROUTINE POINTER
54 00227 011641 ICYC?E:  CYC?J        ;CYCLE ROUTINE POINTER
55 00230 011775 IERR?:  ERR?J        ;ERROR ROUTINE POINTER
56 00231 011632 ICY?C:  CYC?X        ;DELYED CYCLE ROUTINE POINTER
57 00232 010613 ITPS?P:  TPS?P        ;TYPE SPACE ROUTINE POINTER
58
59 00233 011404 IOOT?:  OOT?J
60 00234 000200 RES?T:  JMP  200

```

0013 PTID

```

01
02
03 00235 000000 IOM?0: 0
04 00236 007070 ITTD: TTID
05 00237 007041 ITTI: TTII
06 00240 010376 IPSD1: PSD1
07      006231 LOOPX= JSR@ ICY?C      ; DELAYED LOOP
08      006230 EHALT=JSR@ IERR?
09 00241 007022 ICTS: CTS      ; CTS MESSAGE ROUTINE
10 00242 000000 C0: 0
11 00243 000001 C1: 1
12 00244 000002 C2: 2
13 00245 000003 C3: 3
14 00246 000004 C4: 4
15 00247 000005 C5: 5
16 00250 000006 C6: 6
17 00251 000014 C12: 12
18 00252 000016 C14: 14
19 00253 000026 C22: 22
20 00254 000027 C23: 23
21 00255 000032 C26: 26
22 00256 000034 C28: 28
23 00257 000040 C32: 32
24 00260 000037 C31: 31
25 00261 000041 C33: 33
26 00262 000042 C34: 34
27 00263 000010 C10: 10
28 00264 000011 C11: 11
29 00265 000012 C12: 12
30 00266 000014 C14: 14
31 00267 000016 C16: 16
32 00270 000017 C17: 17
33 00271 000020 C20: 20
34 00272 000021 C21: 21
35 00273 000022 C22: 22
36 00274 000024 C24: 24
37 00275 000025 C25: 25
38 00276 000026 C26: 26
39 00277 000030 C30: 30
40 00300 000031 C31: 31
41 00301 000032 C32: 32
42 00302 000034 C34: 34
43 00303 000036 C36: 36
44 00304 000037 C37: 37
45 00305 000040 C40: 40
46 00306 000052 C52: 52
47 00307 000076 C76: 76
48 00310 000077 C77: 77
49 00311 000100 C100: 100
50 00312 000125 C125: 125
51 00313 000177 C177: 177
52 00314 000200 C200: 200
53 00315 000250 C250: 250
54 00316 000252 C252: 252
55 00317 000277 C277: 277
56 00320 000300 C300: 300
57 00321 000367 C367: 367
58 00322 000376 C376: 376
59 00323 000377 C377: 377
60 00324 000400 C400: 400

```

0014 PTID

```

01 00325 100000 C100K: 100000
02 00326 100200 C1002: 100200
03 00327 100400 C1004: 100400
04 00330 100600 C1006: 100600
05
06
07 00331 177777 CM1: -1
08 00332 177776 CM2: -2
09 00333 177775 CM3: -3
10 00334 177774 CM4: -4
11 00335 177773 CM5: -5
12 00336 177772 CM6: -6
13 00337 177771 CM7: -7
14 00340 177770 CM8: -8.
15 00341 177766 CM10: -10.
16 00342 177767 CM9: -9.
17 00343 177765 CM11: -11.
18 00344 177764 CM12: -12.
19 00345 177763 CM13: -13.
20 00346 177762 CM14: -14.
21 00347 177761 CM15: -15.
22 00350 177760 CM16: -16.
23 00351 177600 CM128: -128.
24 00352 177400 CM256: -256.
25 00353 177000 CM512: -512.
26 00354 177577 KM200: 177577
27 000400 .LOC 400
28
29 00400 000541 B. EGI: BEG1X
30 00401 000000 WHAT: 0
31 00402 062677 BEG1: IORST ; IN THE BEGINNING, RESET I/O
32 00403 006215 JSR0 IMES?
33 00404 012203 DIRT ; NAME
34 00405 020071 LDA 0, BDADR
35 00406 040105 STA 0, QUADR
36 00407 102400 SUB 0, 0
37 00410 040072 STA 0, CLK0
38 00411 040073 STA 0, CLK1
39 00412 040074 STA 0, CLK2
40 00413 040075 STA 0, CLK3
41 00414 040070 STA 0, AC3??
42 00415 024764 LDA 1, WHAT
43 00416 125005 MOV 1, 1, SNR ; INPUT PARAMETERS ALREADY SET?
44 00417 000411 JMP BEG1A ; NO
45 00420 006215 JSR0 IMES? ; ASK IF DESIRED
46 00421 007417 INPDS ; TYPE 1 IF NEW PARAMETERS DESIRED
47 00422 006237 JSR0 ITTI ; GET CHAR
48 00423 000451 JMP BEG0 ; NOT 1
49 00424 102520 SUBZL 0, 0
50 00425 122404 SUB 1, 0, SZR ; NEW PARAMETERS IF A 1
51 00426 000446 JMP BEG0 ; NOT A 1 JUST RESTART
52 00427 040130 STA 0, BDCKK ; CLEAR BAUD RATE ONLY FLAG
53
54 00430 006215 BEG1A: JSR0 IMES?
55 00431 007373 RBCKO ; TYPE 1 TO RUN BAUD CLOCK ONLY
56 00432 006237 JSR0 ITTI ; GET CHAR
57 00433 000406 JMP BEG2 ; NOT A 1
58 00434 102520 SUBZL 0, 0
59 00435 122414 SUB# 1, 0, SZR ; IS IT A 1?
60 00436 000403 JMP BEG2 ; NO

```

0015 PTID

```

01 00437 102000   ADC      0,0
02 00440 040130   STA      0,BDCKK      ;KEEP FLAG
03
04 00441 006215   BEG2: JSR      @IMES?   ;"TYPE 2 DIGIT DEVICE CODE
05 00442 007172   MCODE    ; OF PTI CONTROLLER,
06              ; THEN CARRIAGE RETURN"
07 00443 006237   JSR@     ITTI
08 00444 000775   JMP      BEG2        ;ERROR!
09 00445 030307   LDA      2,C76
10 00446 121005   MOV      1,0,SNR
11 00447 000772   JMP      BEG2
12 00450 125213   MOV#     1,1,SNR
13 00451 146432   SUBZ#    2,1,5ZC      ;@CCODE<76 ALLOWED
14 00452 000767   JMP      BEG2
15 00453 040100   STA      0,TEM       ;MUST BE EVEN #
16 00454 006121   JSR      @IDCHNG     ;CHANGE DEVICE CODE
17 00455 000101   DEVCD
18 00456 000550   A000      ;FIRST LOCATION TO BE CHANGED
19 00457 007021   XXX       ;LAST LOCATION TO BE CHANGED
20 00460 020100   LDA      0,TEM
21 00461 040101   STA      0,DEVCD     ;C(DEVCD) HOLDS PRIME CODE
22
23 00462 006215   BEG3: JSR      @IMES?   ;"TYPE ADDRESS OF FIRST LINE
24 00463 007335   BOUND    ;(IN DECIMAL)="
25 00464 006236   JSR      @ITTD      ;INPUT BOUNDARY ADDRESS
26 00465 000775   JMP      BEG3        ;INPUT ERROR
27 00466 125120   MOVZL    1,1
28 00467 044071   STA      1,BDADR     ;SAVE IT
29 00470 044105   STA      1,QUADR
30 00471 102620   BEG4: SUBZR    0,0      ;MAKE IT LOOK LIKE 16
31 00472 040102   STA      0,NLINE    ;ALMOST
32 00473 000407   JMP      BEG5
33
34 00474 020113   BEG0: LDA      0,YES   ;
35 00475 101005   MOV      0,0,SNR    ;DCU EXIST?
36 00476 002402   JMP@     .+2        ;NO
37 00477 002402   JMP@     .+2        ;YES
38 00500 000540   BEG11    ;START IT UP
39 00501 010102   DC. ST   ;START UP DCU
40
41 00502 006215   BEG5: JSR@     IMES?   ;
42 00503 007245   MDCUX    ;TYPE 0 IF NON DCU SYSTEM
43 00504 006237   JSR@     ITTI      ;GET INPUT
44 00505 000775   JMP      BEG5      ;INPUT ERROR
45 00506 125005   MOV      1,1,SNR    ;RUN DCU?
46 00507 000425   JMP      BEG11-4    ;NO
47 00510 006215   BEG6: JSR@     IMES?   ;
48 00511 007301   MDCU     ;TYPE TWO DIGIT DEV CODE OF DCU
49 00512 006237   JSR@     ITTI
50 00513 000775   JMP      BEG6      ;INPUT ERROR
51 00514 030307   LDA      2,C76
52 00515 121004   MOV      1,0,5ZR    ;0 NOT LEGAL
53 00516 146432   SUBZ#    2,1,5ZC    ;LESS THAN OR EQ 76
54 00517 000771   JMP      BEG6
55 00520 044110   STA      1,TEMP
56 00521 006121   JSR@     IDCHN     ;CHANGE DEV CODE
57 00522 000103   DCODE    ;ORIG CODE
58 00523 010102   DC. ST   ;STARTING ADDRESS
59 00524 010252   HDIN0    ;FINAL ADDRESS
60 00525 126000   ADC      1,1

```

0016 PTID

01	00526	046132	STAO	1, WHAT	;SET NO PARAMETERS SWITCH
02	00527	044113	STA	1, YES	;SET DCU FLAG
03	00530	024110	LDA	1, TEMP	
04	00531	044103	STA	1, DCODE	;KEEP NEW CODE
05	00532	002401	JMP@	. +1	
06	00533	010102	DC. ST		;GO START DCU
07	00534	102000	ADC	0, 0	
08	00535	042132	STAO	0, WHAT	;NO NEW PARAMS
09	00536	102400	SUB	0, 0	
10	00537	040113	STA	0, YES	;CLEAR DCU FLAG
11	00540	020105	BEG11: LDA	0, QUADR	
12	00541	101400	BEG1X: INC	0, 0	;ADD 1 TO FIRST ADDRESS
13	00542	101400	INC	0, 0	;FOR MATCHED LINE
14	00543	040106	STA	0, RECADR	
15	00544	102000	ADC	0, 0	;STORE -1 FOR PRIMARY LINE
16	00545	040104	STA	0, PRIMLINE	;COUNTER
17	00546	024332	LDA	1, CM2	;SET UP SECONDARY LINE COUNTER
18	00547	044107	STA	1, SECLINE	

!0017 PTID

```
01          ;MAIN PROGRAM STARTS HERE
02
03 00550 006226 A000: JSR@  IENT?      ; SELD LINE GROUNDED
04 00551 000003      I
05 00552 062677      IORST
06 00553 063700      SKPDZ  0      ; CHECK O. C. GATE TO SELD
07 00554 006230      EHALT
08 00555 006231      LOOPX
09
10 00556 006226 A001: JSR@  IENT?      ; SELB LINE GROUNDED
11 00557 000003      I
12 00560 062677      IORST
13 00561 063500      SKPBZ  0      ; ICLR GETS SET ON IORST
14 00562 006230      EHALT      ; CHECK O. C. GATE TO SELB,
15 00563 006231      LOOPX      ; MUX AND GATE
16
17 00564 006226 A002: JSR@  IENT?      ; PTI DONE SHOULD NOT BE
18 00565 000003      I
19 00566 062677      IORST
20 00567 063734      SKPDZ  MUX      ; SET
21 00570 006230      EHALT      ; CHECK DONE FLOP, O. C.
22 00571 006231      LOOPX      ; GATES TO SELD, DOC TO
23                          ; DIAG FLOP HIGH ALLOWING
24                          ; DATA TO SET FLOP
25
26 00572 006226 A003: JSR@  IENT?      ; PTI BUSY SHOULD BE SET
27 00573 000003      I
28 00574 062677      IORST
29 00575 030071      LDA    2, B0ADR
30 00576 071034      DOR    2, MUX
31 00577 060000      NIO    0      ; DUMMY INSTRUCTION
32 00600 063434      SKPBN  MUX      ; ON IORST
33 00601 006230      EHALT      ; CHECK SELD O. C. GATE,
34 00602 006231      LOOPX      ; ICLR FLOP, IORST, PTI
35                          ; AND GATE, SCAN COUNT CARRY UP EARLY
36
37 00603 006226 A004: JSR@  IENT?
38 00604 000003      I
39 00605 062677      IORST
40 00606 020271      LDA    0, C20      ; TEST DEVICE SELECTION
41 00607 040100      STA    0, TEM      ; LOGIC-GET MASK
42                          ; FORM EXCLUSIVE OR
43                          ; WITH MASK AND DEVICE
44 00610 024101      LDA    1, DEVCD      ; CODE TO CHANGE
45 00611 131000      MOV    1, 2
46 00612 113520      ANDZL  0, 2      ; ONE BIT AT A TIME
47 00613 107000      ADD    0, 1
48 00614 146400      SUB    2, 1
49 00615 030062      LDA    2, .SKIP      ; ADD NEW DEVICE CODE
50 00616 133000      ADD    1, 2      ; IN SKIP INSTRUCTION
51 00617 050402      STA    2, +2
52 00620 062677      IORST
53 00621 000000      0      ; SKIP INSTRUCTION HERE
54 00622 006230      EHALT      ; CHECK PTI GATE,
55 00623 020100      LDA    0, TEM      ; SELECTION LOGIC
56 00624 101224      MOVZR  0, 0, SZR      ; MOVE MASK RIGHT
57 00625 000762      JMP    A004+4
58 00626 006231      LOOPX
59 00627 060277 A005: INTDS      ; WITH DONE DISABLED,
60 00630 006226      JSR@  IENT?      ; NO INTERRUPT SHOULD
```

```

0018 PTID
01 00631 000003      I
02 00632 062677      IORST
03 00633 102000      ADC      0,0      ; OCCUR
04 00634 062077      MSKO      0
05 00635 060177      INTEN
06 00636 000401      JMP      .+1
07 00637 063477      SKPBN      CPU
08 00640 006230      EHALLT      ; CHECK INT REQ FLOP,
09 00641 060277      INTDS      ; AND O. C. GATE TO
10 00642 006231      LOOPX      ; INT LINE
11
12 00643 006226 A006: JSR@      IENT?      ; WITH MASK FLOP
13 00644 000003      I
14 00645 062677      IORST
15 00646 060177      INTEN      ; OFF, AN INTERRUPT
16 00647 000401      JMP      .+1      ; OCCURED WITHOUT DONE
17 00650 063477      SKPBN      CPU
18 00651 006230      EHALLT      ; CHECK AND (MASK FLOP, DONE)
19 00652 006231      LOOPX      ; TO INT REQ FLOP
20
21 00653 006226 A007: JSR@      IENT?      ; A DIA INSTRUCTION TO
22 00654 000003      I
23 00655 062677      IORST
24 00656 060400      DIA      0,0      ; DEVICE 0 SHOULD READ NO
25 00657 101014      MOV#      0,0,SZR ; BITS
26 00660 006230      EHALLT      ; CHECK FOR GROUNDS ON
27 00661 006231      LOOPX      ; IN/OUT BUS
28
29 00662 006226 A008: JSR@      IENT?      ; WITH NO DONE FLAGS SET
30 00663 000003      I
31 00664 062677      IORST
32 00665 061477      INTA      0      ; NO DEVICE CODES SHOULD
33 00666 101014      MOV#      0,0,SZR ; BE READ BACK VIA INTA
34 00667 006230      EHALLT      ; CHECK INPUTS TO DEVICE
35 00670 006231      LOOPX      ; CODE O. C. GATES, INTACK
36
37 00671 006226 A009: JSR@      IENT?
38 00672 000003      I
39 00673 062677      IORST
40      ADROUT
41 00674 030071      LDA      2,BDADR ; ADDRESS CORRECT
42 00675 071034      DOR      2,MUX   ; BOARD
43 00676 102400      SUB      0,0
44 00677 062677      IORST
45 00700 063034      DOC      0,MUX
46 00701 063534      SKPBZ      MUX   ; BUSY SHOULD BE RESET
47 00702 006230      EHALLT      ; CHECK DOC, DOR TO ICLR,
48 00703 006231      LOOPX      ; O. C. GATE TO SELB,
49      ; ICLR FLOP, B0EN LOGIC
50      ; DOC AND GATE, MUXENAB
51      ; DOC DECODER INPUTS (PTI-16)
52
53 00704 006226 A010: JSR@      IENT?      ; SEE THAT DOC 0 DOES
54 00705 000003      I
55 00706 062677      IORST
56      ADROUT      ; NOT RESET BUSY
57 00707 030071      LDA      2,BDADR ; ADDRESS CORRECT
58 00710 071034      DOR      2,MUX   ; BOARD
59 00711 102400      SUB      0,0
60 00712 062677      IORST

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0019 PTID
01 00713 063000 DOC 0,0
02 00714 063434 SKPBN MUX
03 00715 006230 EHALT ;CHECK PTI INPUT TO DOC
04 00716 006231 LOOPX
05
06 00717 006226 A011: JSR@ IENT? ;DO NOT RESET BUSY WITH
07 00720 000003 I
08 00721 062677 IORST
09 ADROUT ;DATA-1 SET ON A DOC
10 00722 030071 LDA 2,BDADR ;ADDRESS CORRECT
11 00723 071034 DOR 2,MUX ;BOARD
12 00724 102620 SUBZR 0,0 ;GENERATE DATA-1
13 00725 101220 MOVZR 0,0
14 00726 062677 IORST
15 00727 063034 DOC 0,MUX
16 00730 063434 SKPBN MUX
17 00731 006230 EHALT ;CHECK -(DATA1-B) INPUT
18 00732 006231 LOOPX ;TO DOC LOGIC
19
20 00733 006226 A012: JSR@ IENT? ;DO NOT RESET BUSY
21 00734 000003 I
22 00735 062677 IORST
23 ADROUT ;WITH DATA0 SET ON A
24 ;DOC
25 00736 030071 LDA 2,BDADR ;ADDRESS CORRECT
26 00737 071034 DOR 2,MUX ;BOARD
27 00740 102620 SUBZR 0,0 ;GENERATE DATA0
28 00741 062677 IORST
29 00742 063034 DOC 0,MUX
30 00743 063434 SKPBN MUX
31 00744 006230 EHALT ;CHECK -(DATA0-B) INPUT
32 00745 006231 LOOPX ;TO -(XRDOC), -(DOC)
33
34 00746 006226 A013: JSR@ IENT? ;SET ICLR WITH START PULSE
35 00747 000003 I
36 00750 062677 IORST
37 RICLR
38 ADROUT ;RESET ICLR TO
39 00751 030071 LDA 2,BDADR ;ADDRESS CORRECT
40 00752 071034 DOR 2,MUX ;BOARD
41 00753 102400 SUB 0,0 ;ENABLE "DONE" AND
42 00754 063034 DOC 0,MUX ;RESET "BUSY"
43 00755 060134 NIOS MUX
44 00756 063434 SKPBN MUX ;CHECK BUSY GOT SET AGAIN
45 00757 006230 EHALT ;CHECK STRT AND MUXENAB
46 00760 006231 LOOPX ;TO ICLR
47
48 00761 006226 A014: JSR@ IENT? ;TRY TO SET ICLR WITH
49 00762 000003 I
50 00763 062677 IORST
51 RICLR ;STRT DEVICE 0
52 ADROUT ;RESET ICLR TO
53 00764 030071 LDA 2,BDADR ;ADDRESS CORRECT
54 00765 071034 DOR 2,MUX ;BOARD
55 00766 102400 SUB 0,0 ;ENABLE "DONE" AND
56 00767 063034 DOC 0,MUX ;RESET "BUSY"
57 00770 060100 NIOS 0
58 00771 063534 SKPBZ MUX
59 00772 006230 EHALT ;CHECK MUXENAB
60 00773 006231 LOOPX ;

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0020 PTID

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01                                     ;CHECK BUSY DOES NOT
02                                     ;GET RESET WITH DOB
03 00774 006226 A015: JSR@   IENT?   ;TRYING TO SET B0EN
04 00775 000003      I
05 00776 062677      IORST
06 00777 030071      LDA     2, BDADR   ;CLEAR B0EN BY ADDRESSING
07 01000 024311      LDA     1, C100   ;ANOTHER BOARD
08 01001 133000      ADD     1, 2
09 01002 071034      DOR     2, MUX
10 01003 030071      LDA     2, BDADR
11 01004 072034      DOB     2, MUX
12 01005 102400      SUB     0, 0
13 01006 062677      IORST
14 01007 063034      DOC     0, MUX
15 01010 071034      DOR     2, MUX
16 01011 063434      SKPBN  MUX
17 01012 006230      EHFLT   ;CHECK DOR TO B0EN
18 01013 006231      LOOPX   ;BOARD ADDRESS LOGIC,
19                                     ;DOR
20
21                                     ;ENSURE BUSY DOES NOT GET
22                                     ;RESET WITH DOR 0 TRYING
23 01014 006226 A016: JSR@   IENT?   ;TO SET B0EN
24 01015 000003      I
25 01016 062677      IORST
26 01017 030071      LDA     2, BDADR   ;CLEAR B0EN BY ADDRESSING
27 01020 024311      LDA     1, C100   ;ANOTHER BOARD
28 01021 133000      ADD     1, 2
29 01022 071034      DOR     2, MUX
30 01023 030071      LDA     2, BDADR
31 01024 071000      DOR     2, 0
32 01025 102400      SUB     0, 0
33 01026 062677      IORST
34 01027 063034      DOC     0, MUX
35 01030 071034      DOR     2, MUX
36 01031 063434      SKPBN  MUX
37 01032 006230      EHFLT   ;CHECK PTI INPUT TO
38 01033 006231      LOOPX   ;DOR
39
40 01034 006226 A017: JSR@   IENT?   ;CHECK ONLINE GETS RESET
41 01035 000003      I
42 01036 062677      IORST
43 01037 006123      JSR@   IDELI
44 01040 063534      SKPBN  MUX
45 01041 006230      EHFLT   ;CHECK MCLR, ONLINE FLOP,
46 01042 006231      LOOPX   ;ONLINE TO TIMER CONTROL
47                                     ;FIRST STAGE OF TIMER, TIM6,
48                                     ;LVHILN, 5 CP(0), SCAN
49                                     ;ADDRESS, MCLK
50 01043 006226 A018: JSR@   IENT?
51 01044 000003      I
52 01045 062677      IORST
53 01046 060277      INTDS
54 01047 006120      JSR@   IDELA
55      SDONE
56      ADROUT
57 01050 030071      LDA     2, BDADR   ;ADDRESS CORRECT
58 01051 071034      DOR     2, MUX   ;BOARD
59 01052 020063      LDA     0, K400   ;SET "DONE" FLOP
60 01053 063034      DOC     0, MUX   ;ARTIFICIALLY

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0021 PTID
01 01054 063634 SKPDN MUX ;CHECK DONE SET
02 01055 006230 EHALT ;NOT SET-CHECK O. C. GATE
03 01056 006231 LOOPX ;TO SELD, DONE FLOP, DIAG
04 ;DONE SETTING, ROENB
05
06 01057 006226 A019: JSR@ IENT? ;SEE THAT BOARD WILL
07 01060 000003 I
08 01061 062677 IORST
09 01062 060277 INTDS ;GIVE INTERRUPT
10 01063 020354 LDA 0,KM200
11 01064 062077 MSKO 0
12 01065 006120 JSR@ IDELA
13 01066 060177 INTEN
14 SDONE
15 ADROUT
16 01067 030071 LDA 2,BDADR ;ADDRESS CORRECT
17 01070 071034 DOR 2,MUX ;BOARD
18 01071 020063 LDA 0,K400 ;SET "DONE" FLOP
19 01072 063034 DOC 0,MUX ;ARTIFICIALLY
20 01073 060000 NIO 0 ;DUMMY INSTRUCTIONS
21 01074 060000 NIO 0
22 01075 063577 SKPBZ CPU
23 01076 006230 EHALT ;CHECK MASK FLOP, INTR
24 01077 060277 INTDS
25 01100 006231 LOOPX ;O. C. GATE, INT FLOP, ROENB
26 ;CLEAR, IORST HELD LOW
27
28 01101 006226 A020: JSR@ IENT? ;CLEAR DONE WITH -(DIAGC)
29 01102 000003 I
30 01103 062677 IORST
31 01104 006120 JSR@ IDELA
32 SDONE ;SET DONE
33 ADROUT
34 01105 030071 LDA 2,BDADR ;ADDRESS CORRECT
35 01106 071034 DOR 2,MUX ;BOARD
36 01107 020063 LDA 0,K400 ;SET "DONE" FLOP
37 01110 063034 DOC 0,MUX ;ARTIFICIALLY
38 01111 020314 LDA 0,C200 ;DATA BIT 0
39 01112 063034 DOC 0,MUX
40 01113 060000 NIO 0 ;DUMMY INSTRUCTION
41 01114 063734 SKPDZ MUX ;DONE SHOULD BE RESET
42 01115 006230 EHALT ;-(DIAGC) INPUT TO CLR DONE
43 01116 006231 LOOPX ;FLOP, MCLK, DONE FLOP
44 ;CLR DONE GROUNDED
45
46 01117 006226 A021: JSR@ IENT? ;CLEAR DONE WITH CLEAR
47 01120 000003 I
48 01121 062677 IORST
49 01122 006120 JSR@ IDELA
50 SDONE
51 ADROUT
52 01123 030071 LDA 2,BDADR ;ADDRESS CORRECT
53 01124 071034 DOR 2,MUX ;BOARD
54 01125 020063 LDA 0,K400 ;SET "DONE" FLOP
55 01126 063034 DOC 0,MUX ;ARTIFICIALLY
56 01127 060234 NIOC MUX ;BOARD CLEAR
57 01130 060000 NIO 0 ;DUMMY INSTRUCTION
58 01131 063734 SKPDZ MUX
59 01132 006230 EHALT ;CHECK -(CLEAR) TO CLR DONE
60 01133 006231 LOOPX ;FLOP, TIME ALWAYS ON

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0022 PTID

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01 ; ICLR TO DONE LOGIC
02
03 01134 006226 A022: JSR@ IENT? ; DON'T CLEAR DONE WITHOUT
04 01135 000003 I
05 01136 062677 IORST
06 01137 006120 JSR@ IDELA ; -(DATA-0-B)
07 SDONE
08 ADROUT
09 01140 030071 LDA 2, BDADR ; ADDRESS CORRECT
10 01141 071034 DDA 2, MUX ; BOARD
11 01142 020063 LDA 0, K400 ; SET "DONE" FLOP
12 01143 063034 DOC 0, MUX ; ARTIFICIALLY
13 01144 020314 LDA 0, C200
14 01145 126620 SUBZR 1, 1 ; SET DATA-0 IN OUTPUT
15 01146 123000 ADD 1, 0 ; WORD
16 01147 063034 DOC 0, MUX
17 01150 063634 SKPDN MUX
18 01151 006230 EHALT ; CHECK -(DATA-0-B) TO
19 01152 006231 LOOPX ; CLR DONE
20 01153 006226 A023: JSR@ IENT? ; DO NOT GET INTERRUPT WITH
21 01154 000003 I
22 01155 062677 IORST
23 01156 060277 INTDS
24 01157 102000 ADC 0, 0 ; MASK ON
25 01160 062077 MSKO 0
26 01161 006120 JSR@ IDELA
27 01162 060177 INTEN
28 SDONE
29 ADROUT
30 01163 030071 LDA 2, BDADR ; ADDRESS CORRECT
31 01164 071034 DDA 2, MUX ; BOARD
32 01165 020063 LDA 0, K400 ; SET "DONE" FLOP
33 01166 063034 DOC 0, MUX ; ARTIFICIALLY
34 01167 060000 NIO 0
35 01170 060000 NIO 0 ; WAIT FOR A WHILE
36 01171 063477 SKPBN CPU
37 01172 006230 EHALT ; CHECK MASK FLOP
38 01173 006231 LOOPX
39
40 01174 006226 A024: JSR@ IENT? ; CLEAR MASK WITH IORST
41 01175 000003 I
42 01176 102000 ADC 0, 0
43 01177 062077 MSKO 0
44 01200 062677 IORST
45 01201 006120 JSR@ IDELA
46 01202 060177 INTEN
47 SDONE
48 ADROUT
49 01203 030071 LDA 2, BDADR ; ADDRESS CORRECT
50 01204 071034 DDA 2, MUX ; BOARD
51 01205 020063 LDA 0, K400 ; SET "DONE" FLOP
52 01206 063034 DOC 0, MUX ; ARTIFICIALLY
53 01207 060000 NIO 0 ; DUMMY INSTRUCTIONS
54 01210 060000 NIO 0
55 01211 063577 SKPBZ CPU
56 01212 006230 EHALT ; IORST TO INT ENABLE
57 01213 060277 INTDS ; INT REQ FLOP
58 01214 006231 LOOPX
59 01215 006226 A026: JSR@ IENT?
60 01216 000003 I
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0023 PTID

01	01217	062677	IORST		
02	01220	060277	INTDS		; INT REQ FLOP
03	01221	020354	LDA	0, KM200	
04	01222	062077	MSKO	0	
05	01223	006120	JSR@	IDELA	
06	01224	060177	INTEN		
07			SDONE		
08			ADR0UT		
09	01225	030071	LDA	2, BDADR	; ADDRESS CORRECT
10	01226	071034	D0R	2, MUX	; BOARD
11	01227	020063	LDA	0, K400	; SET "DONE" FLOP
12	01230	063034	DOC	0, MUX	; ARTIFICIALLY
13	01231	060000	NIO	0	; DUMMY INSTRUCTION
14	01232	060200	NIOC	0	; CLEAR DEVICE 0
15	01233	063577	SKPBZ	CPU	
16	01234	006230	EHALT		; -(CLEAR) TO INT ENBLE FLOP
17	01235	060277	INTDS		
18	01236	006231	LOOPX		
19					
20	01237	006226	A027: JSR@	IENT?	; TRY TO CLEAR INTERRUPT WITH A
21	01240	000003	I		
22	01241	062677	IORST		
23	01242	020354	LDA	0, KM200	
24	01243	062077	MSKO	0	
25	01244	006120	JSR@	IDELA	
26	01245	060177	INTEN		
27			SDONE		; SET DONE-GIVES INTERRUPT
28			ADR0UT		
29	01246	030071	LDA	2, BDADR	; ADDRESS CORRECT
30	01247	071034	D0R	2, MUX	; BOARD
31	01250	020063	LDA	0, K400	; SET "DONE" FLOP
32	01251	063034	DOC	0, MUX	; ARTIFICIALLY
33	01252	060000	NIO	0	; DUMMY INSTRUCTION
34	01253	061477	INTA	0	
35	01254	060277	INTDS		
36	01255	024101	LDA	1, DEVCD	; DEVICE CODE OF BOARD
37	01256	122414	SUB#	1, 0, SZR	
38	01257	006230	EHALT		; MUXENAB INPUT TO CLEAR
39	01260	006231	LOOPX		
40	01261	006226	A028: JSR@	IENT?	; CHECK INTERRUPT ACKNOWLEDGE
41	01262	000003	I		
42	01263	062677	IORST		
43	01264	020354	LDA	0, KM200	
44	01265	062077	MSKO	0	
45	01266	006120	JSR@	IDELA	
46	01267	060177	INTEN		
47			SDONE		
48			ADR0UT		
49	01270	030071	LDA	2, BDADR	; ADDRESS CORRECT
50	01271	071034	D0R	2, MUX	; BOARD
51	01272	020063	LDA	0, K400	; SET "DONE" FLOP
52	01273	063034	DOC	0, MUX	; ARTIFICIALLY
53	01274	060000	NIO	0	; DUMMY INSTRUCTION
54	01275	060400	DIA	0, 0	; DUMMY READ INPUT
55	01276	060277	INTDS		
56	01277	024101	LDA	1, DEVCD	; DEVICE CODE OF BOARD
57	01300	122415	SUB#	1, 0, SNR	; CHECK INACK, HIGH OR FLOATING
58	01301	006230	EHALT		
59	01302	006231	LOOPX		
60					

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0024 PTID
01 01303 000403      JMP      A029
02 01304 177576 KM201: 177576
03 01305 173577 KM420: 173577
04 01306 020113 A029: LDA      0, YES
05 01307 101004      MOV      0, 0, SZR      ; IS THIS A DCU ?
06 01310 000431      JMP      A030          ; YES
07 01311 020235      LDA      0, IOM?0     ; GET IOMODULE
08 01312 101004      MOV      0, 0, SZR     ; IF ZERO ASSUME A TTY
09 01313 000466 XA031: JMP      A031
10
11 01314 006226 A029A: JSR@     IENT?      ; ENABLE HIGHER PRIORITY
12 01315 000003      I
13 01316 062677      IORST
14
15
16
17 01317 020765      LDA      0, KM201
18 01320 062077      MSKO     0
19 01321 006120      JSR@     IDELA
20
21
22 01322 030071      LDA      2, B0ADR     ; ADDRESS CORRECT
23 01323 071034      D0A      2, MUX      ; BOARD
24 01324 020063      LDA      0, K400     ; SET "DONE" FLOP
25 01325 063034      DOC      0, MUX      ; ARTIFICIALLY
26 01326 061111      D0RS     0, TTO      ; SET DONE ON PTI
27 01327 063511      SKPBZ    TTO        ; START HIGHER DEVICE
28 01330 000777      JMP      . -1
29 01331 024264      LDA      1, C11      ; HIGHER DEVCODE=11
30 01332 061477      INTA     0
31 01333 106434      SUBZ#    0, 1, SZR
32 01334 006230      EHALLT
33 01335 006231      LOOPX
34 01336 000443      JMP      A031
35
36 01337 000000 A30TX: 0
37 01340 000010 A3010: 10
38 01341 006226 A030: JSR@     IENT?      ; ENABLE HIGHER PRIORITY
39 01342 000003      I
40 01343 062677      IORST
41
42
43 01344 020741      LDA      0, KM420
44 01345 062077      MSKO     0
45 01346 006120      JSR@     IDELA
46
47
48 01347 030071      LDA      2, B0ADR     ; ADDRESS CORRECT
49 01350 071034      D0A      2, MUX      ; BOARD
50 01351 020063      LDA      0, K400     ; SET "DONE" FLOP
51 01352 063034      DOC      0, MUX      ; ARTIFICIALLY
52 01353 102520      SUBZL    0, 0
53 01354 061076      D0A      0, DCU      ; SET DONE ON DCU (RTC)
54 01355 063476      SKPBN    DCU
55 01356 000406      JMP      A030G       ; CHECK DEVICE CODE
56 01357 101404      INC      0, 0, SZR    ; TIMEOUT CLOCK
57 01360 000775      JMP      . -3
58 01361 014756      DSZ      A30TX       ; BUMP BIG COUNT
59 01362 000773      JMP      . -5
60 01363 000407      JMP      A031E       ; DCU RTC TIMEOUT

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0025 PTID

01	01364	024307	A030G:	LDA	1, C76	
02	01365	061477		INTA	0	
03	01366	106434		SUBZ#	0, 1, SZR	; (INTPIN) INPUT TO INACK FLOATING
04	01367	006230		EHALT		
05	01370	006231		LOOPX		
06	01371	000410		JMP	A031	
07	01372	034206	A031E:	LDA	3, ITR?R	; GET ERROR SWITCH
08	01373	175004		MOV	3, 3, SZR	; IS IT SET?
09	01374	000403		JMP	. +3	; YES, DON'T PRINT MESSAGE
10	01375	006215		JSR	@IMES?S	
11	01376	007076		DCURT		; DCU RTC FAILED TO INTERRUPT
12	01377	006230		EHALT		
13	01400	006231		LOOPX		
14	01401	006226	A031:	JSR@	IENT?	; TRY TO CLEAR DONE WITHOUT DIC
15	01402	000003		I		
16	01403	062677		IORST		
17	01404	006120		JSR@	IDELA	
18				SDONE		; SET DONE-GIVES INTERRUPT
19				ADROUT		
20	01405	030071		LDA	2, BDADR	; ADDRESS CORRECT
21	01406	071034		DOR	2, MUX	; BOARD
22	01407	020063		LDA	0, K400	; SET "DONE" FLOP
23	01410	063034		DOC	0, MUX	; ARTIFICIALLY
24	01411	020314		LDA	0, C200	
25	01412	062034		DOB	0, MUX	
26	01413	063634		SKPDN	MUX	; THIS SHOULD NOT RESET DONE
27	01414	006230		EHALT		; DOC HIGH TO -(DIAGC)
28	01415	006231		LOOPX		
29						
30	01416	006226	A032:	JSR@	IENT?	; DON'T SET DONE ON A
31	01417	000003		I		
32	01420	062677		IORST		
33	01421	006120		JSR@	IDELA	
34				ADROUT		; DOB-DIAGNOSTIC LOGIC
35	01422	030071		LDA	2, BDADR	; ADDRESS CORRECT
36	01423	071034		DOR	2, MUX	; BOARD
37	01424	020063		LDA	0, K400	
38	01425	062034		DOB	0, MUX	
39	01426	063734		SKPDZ	MUX	
40	01427	006230		EHALT		; CHECK DOC INPUT TO
41	01430	006231		LOOPX		; GATE SETTING DONE- ALSO
42						; ICLR NEVER CLEARED DONE
43						
44	01431	006226	A033:	JSR@	IENT?	; DON'T SET DONE WITHOUT
45	01432	000003		I		
46	01433	062677		IORST		
47	01434	006120		JSR@	IDELA	; DATA-7
48	01435	102400		SUB	0, 0	
49	01436	063034		DOC	0, MUX	
50	01437	063734		SKPDZ	MUX	
51	01440	006230		EHALT		; CHECK DATA7 INPUT TO
52	01441	006231		LOOPX		; DIAGNOSTIC GATE ON DONE FLOP
53	01442	006226	A034:	JSR@	IENT?	; DON'T SET DONE WITHOUT
54	01443	000003		I		
55	01444	062677		IORST		
56	01445	006120		JSR@	IDELA	; -(DATA-0-B)
57	01446	020063		LDA	0, K400	
58	01447	126620		SUBZR	1, 1	; SET DATA-0 IN OUTPUT
59	01450	123400		AND	1, 0	; WORD
60	01451	063034		DOC	0, MUX	

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0026 PTID
01 01452 063734 SKPDZ MUX
02 01453 006230 EHALT ;CHECK -(DATA-0-B) TO
03 01454 006231 LOOPX ;DONE SETTING LOGIC
04
05 01455 006226 A035: JSR0 IENT? ;DON'T CLEAR DONE WITHOUT
06 01456 000003 I
07 01457 062677 IORST
08 01460 006120 JSR0 IDELA ;DATAB
09 SDONE
10 ADROUT
11 01461 030071 LDA 2, BDADR ;ADDRESS CORRECT
12 01462 071034 DOA 2, MUX ;BOARD
13 01463 020063 LDA 0, K400 ;SET "DONE" FLOP
14 01464 063034 DOC 0, MUX ;ARTIFICIALLY
15 01465 102400 SUB 0, 0
16 01466 063034 DOC 0, MUX
17 01467 063634 SKPDN MUX
18 01470 006230 EHALT ;CHECK DATAB TO -(DIAGC)
19 01471 006231 LOOPX
20
21 01472 006226 A036: JSR0 IENT?
22 01473 000003 I
23 01474 062677 IORST
24 01475 006120 JSR0 IDELA
25 SDONE
26 ADROUT
27 01476 030071 LDA 2, BDADR ;ADDRESS CORRECT
28 01477 071034 DOA 2, MUX ;BOARD
29 01500 020063 LDA 0, K400 ;SET "DONE" FLOP
30 01501 063034 DOC 0, MUX ;ARTIFICIALLY
31 01502 060434 DIA 0, MUX ;READ IN ADDRESS AFTER
32 01503 024060 LDA 1, AMASK ;SETTING DONE-MASK
33 01504 123400 AND 1, 0 ;BOARD ADDRESS-COM
34 01505 024071 LDA 1, BDADR ;PARE WITH CORRECT
35 01506 122414 SUB# 1, 0, SZR ;BOARD ADDRESS
36 01507 006230 EHALT ;CHECK MUX DINA TO O. C. GATES, DIA
37 01510 006231 LOOPX
38 01511 006226 A037: JSR0 IENT? ;TRY TO READ IN BOARD
39 01512 000003 I
40 01513 062677 IORST
41 ;ADDRESS WITHOUT SETTING
42 01514 006120 JSR0 IDELA ;DONE-SHOULD NOT READ
43 01515 060434 DIA 0, MUX
44 01516 024060 LDA 1, AMASK
45 01517 123414 AND# 1, 0, SZR ;CHECK FOR ZERO BOARD ADDRESS
46 01520 006230 EHALT ;CHECK DONE TO MUX DINA
47 01521 006231 LOOPX
48
49 01522 006226 A038: JSR0 IENT? ;CHECK DONE WITHOUT PTI WITH
50 01523 000003 I
51 01524 062677 IORST
52 01525 006120 JSR0 IDELA ;DONE SET
53 SDONE
54 ADROUT
55 01526 030071 LDA 2, BDADR ;ADDRESS CORRECT
56 01527 071034 DOA 2, MUX ;BOARD
57 01530 020063 LDA 0, K400 ;SET "DONE" FLOP
58 01531 063034 DOC 0, MUX ;ARTIFICIALLY
59 01532 063700 SKPDZ 0
60 01533 006230 EHALT ;PTI INPUT TO SELD GATE

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0027 PTID
01 01534 006231 LOOPX ;HIGH OR FLOATING
02
03 01535 006226 A039: JSR@ IENT? ;CHECK MUX DINA INPUT WITHOUT DIA
04 01536 000003 I
05 01537 062677 IORST
06 01540 006120 JSR@ IDELA
07 SDONE
08 ADROUT
09 01541 030071 LDA 2, BDADR ;ADDRESS CORRECT
10 01542 071034 DOR 2, MUX ;BOARD
11 01543 020063 LDA 0, K400 ;SET "DONE" FLOP
12 01544 063034 DOR 0, MUX ;ARTIFICIALLY
13 01545 102400 SUB 0, 0
14 01546 060034 NIO MUX
15 01547 101004 MOV 0, 0, SZR
16 01550 006230 EHALL ;DIA ALWAYS ON
17 01551 006231 LOOPX
18 01552 000416 JMP B00A
19

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0028 PTID

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01          ;CHECK TIMER
02
03 01553 054414 BSET: STA 3, BSRET
04 01554 020071 LDA 0, B0ADR ;CLEAR ALL TRANSMITTERS
05 01555 024352 LDA 1, CM256. ;AND RECEIVERS
06 01556 006126 JSR@ ISUBY
07 01557 006125 JSR@ ISUBX
08 01560 000777 JMP .-1
09 01561 020071 LDA 0, B0ADR
10 01562 024352 LDA 1, CM256.
11 01563 006127 JSR@ ISUBZ
12 01564 006125 JSR@ ISUBX
13 01565 000777 JMP .-1
14 01566 002401 JMP @BSRET
15 01567 000000 BSRET: 0
16
17 01570 004763 B00A: JSR BSET
18
19 01571 006226 B000: JSR@ IENT?
20 01572 000003 I
21 01573 062677 IORST
22 01574 006120 JSR@ IDELA ;WAIT FOR TIMER TO
23 SDONE ;TIME OUT
24 ADROUT
25 01575 030071 LDA 2, B0ADR ;ADDRESS CORRECT
26 01576 071034 D0A 2, MUX ;BOARD
27 01577 020063 LDA 0, K400 ;SET "DONE" FLOP
28 01600 063034 DOC 0, MUX ;ARTIFICIALLY
29 01601 060434 DIA 0, MUX ;GET SCAN ADDRESS
30 01602 024061 LDA 1, B0MASK
31 01603 123400 AND 1, 0 ;MASK SCAN
32 01604 142414 SUB# 2, 0, SZR ;IS SCAN =STARTING ADDRESS
33 ;OF LINES-(0, 4, OR 8)
34 01605 006230 EHALT ;NO, CHECK SCAN ADDRESS
35 01606 006231 LOOPX ;COUNTER, TIMER INHIBIT (ONLINE),
36 ;TIME STATE COUNTER, SCP, TIME,
37 ;LVH LIN TO ICLR, ICLR, TIMER
38 ;CRYSTAL
39
40 01607 006226 B001: JSR@ IENT? ;CHECK SCAN ADDRESS
41 01610 000003 I
42 01611 062677 IORST
43 01612 006120 JSR@ IDELA ;COUNTER AT DIFFERENT TIMES
44 SDONE ;TO SEE IF TIMER IS RUNNING
45 ADROUT
46 01613 030071 LDA 2, B0ADR ;ADDRESS CORRECT
47 01614 071034 D0A 2, MUX ;BOARD
48 01615 020063 LDA 0, K400 ;SET "DONE" FLOP
49 01616 063034 DOC 0, MUX ;ARTIFICIALLY
50 01617 064434 DIA 1, MUX
51 01620 030337 LDA 2, CM7 ;RANDOM ADDRESS TIME
52 01621 006124 JSR@ IDEL1
53 01622 060434 DIA 0, MUX
54 01623 122414 SUB# 1, 0, SZR
55 01624 006230 EHALT ;TIMER RUNNING-CHECK
56 01625 006231 LOOPX ;ONLINE FLOP TO TIMER
57
```

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!0029 PTID
01 01626 006226 B003: JSR@ IENT? ; MAKE SURE SETTING DONE
02 01627 000003 I
03 01630 062677 IORST
04 01631 006120 JSR@ IDELA ; RESETS CLR DONE AT RIGHT TIME
05 SDONE
06 ADROUT
07 01632 030071 LDA 2, BDADR ; ADDRESS CORRECT
08 01633 071034 DOR 2, MUX ; BOARD
09 01634 020063 LDA 0, K400 ; SET "DONE" FLOP
10 01635 063034 DOC 0, MUX ; ARTIFICIALLY
11 DIAG
12 01636 020314 LDA 0, C200 ; ISSUE CLEAR WITHOUT
13 01637 063034 DOC 0, MUX ; GOING ON LINE
14 CLOCK 34.
15 01640 020262 LDA 0, C34.
16 01641 006117 JSR @ICONT
17 SDONE ; DONE SHOULD SET
18 ADROUT
19 01642 030071 LDA 2, BDADR ; ADDRESS CORRECT
20 01643 071034 DOR 2, MUX ; BOARD
21 01644 020063 LDA 0, K400 ; SET "DONE" FLOP
22 01645 063034 DOC 0, MUX ; ARTIFICIALLY
23 01646 063634 SKPDN MUX
24 01647 006230 EHALT ; CHECK DONE(1) INPUT TO
25 01650 006231 LOOPX ; CLR DONE FLOP, DONE FLOP, MCLK
26 ; IOPLS TO CLOCK
27
28 01651 006226 B004: JSR@ IENT? ; CHECK SCAN #1
29 01652 000003 I
30 01653 062677 IORST
31 01654 006120 JSR@ IDELA
32 LINE 1 ; TSO, LINE 1
33 ADROUT
34 01655 030071 LDA 2, BDADR ; ADDRESS CORRECT
35 01656 071034 DOR 2, MUX ; BOARD
36 01657 024331 LDA 1, CM1
37 CLOCK 32. ; FULL CYCLE
38 01660 020257 LDA 0, C32
39 01661 006117 JSR @ICONT
40 01662 125404 INC 1, 1, SZR
41 01663 000775 JMP .-3
42 SDONE
43 ADROUT
44 01664 030071 LDA 2, BDADR ; ADDRESS CORRECT
45 01665 071034 DOR 2, MUX ; BOARD
46 01666 020063 LDA 0, K400 ; SET "DONE" FLOP
47 01667 063034 DOC 0, MUX ; ARTIFICIALLY
48 01670 060434 DIA 0, MUX
49 01671 024061 LDA 1, BMASK
50 01672 123400 AND 1, 0 ; MASK SCAN
51 01673 024244 LDA 1, C2
52 01674 133000 ADD 1, 2
53 01675 142414 SUB# 2, 0, SZR ; IS SCAN 1
54 01676 006230 EHALT ; NO, CHECK SCAN ADDRESS
55 01677 006231 LOOPX ; COUNTER, MUX DINA O. C. GATE
56 ; ALSO, DONE MIGHT HAVE SET
57 ; ON PREVIOUS LINE DUE TO
58 ; TRANSMITTER
59 01700 006226 B005: JSR@ IENT? ; CHECK SCAN #2
60 01701 000003 I

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0030 PTID

01	01702	062677	IORST		
02	01703	006120	JSR@	IDELA	
03			LINE	2	;TS0, LINE 2
04			ADROUT		
05	01704	030071	LDA	2, BDADR	;ADDRESS CORRECT
06	01705	071034	DOR	2, MUX	;BOARD
07	01706	024332	LDA	1, CM2	
08			CLOCK	32	;FULL CYCLE
09	01707	020257	LDA	0, C32	
10	01710	006117	JSR	@ICONT	
11	01711	125404	INC	1, 1, SZR	
12	01712	000775	JMP	.-3	
13			SDONE		
14			ADROUT		
15	01713	030071	LDA	2, BDADR	;ADDRESS CORRECT
16	01714	071034	DOR	2, MUX	;BOARD
17	01715	020063	LDA	0, K400	;SET "DONE" FLOP
18	01716	063034	DOC	0, MUX	;ARTIFICIALLY
19	01717	060434	DIA	0, MUX	
20	01720	024061	LDA	1, BMASK	
21	01721	123400	AND	1, 0	;MASK SCAN
22	01722	024246	LDA	1, C4	
23	01723	133000	ADD	1, 2	
24					
25	01724	112414	SUB#	0, 2, SZR	;IS SCAN 2
26	01725	006230	EHALT		;NO, CHECK SCAN ADDRESS
27	01726	006231	LOOPX		;COUNTER, MUX DINA O. C. GATE
28					
29	01727	006226 B006:	JSR@	IENT?	;CHECK SCAN #3
30	01730	000003	I		
31	01731	062677	IORST		
32	01732	006120	JSR@	IDELA	
33			LINE	3	;TS0, LINE 3
34			ADROUT		
35	01733	030071	LDA	2, BDADR	;ADDRESS CORRECT
36	01734	071034	DOR	2, MUX	;BOARD
37	01735	024333	LDA	1, CM3	
38			CLOCK	32	;FULL CYCLE
39	01736	020257	LDA	0, C32	
40	01737	006117	JSR	@ICONT	
41	01740	125404	INC	1, 1, SZR	
42	01741	000775	JMP	.-3	
43			SDONE		
44			ADROUT		
45	01742	030071	LDA	2, BDADR	;ADDRESS CORRECT
46	01743	071034	DOR	2, MUX	;BOARD
47	01744	020063	LDA	0, K400	;SET "DONE" FLOP
48	01745	063034	DOC	0, MUX	;ARTIFICIALLY
49	01746	060434	DIA	0, MUX	
50	01747	024061	LDA	1, BMASK	
51	01750	123400	AND	1, 0	;MASK SCAN
52	01751	024250	LDA	1, C6	
53	01752	133000	ADD	1, 2	
54	01753	142414	SUB#	2, 0, SZR	;IS SCAN 3
55	01754	006230	EHALT		;NO, CHECK SCAN ADDRESS
56	01755	006231	LOOPX		;COUNTER, MUX DINA O. C. GATE
57	01756	006226 B007:	JSR@	IENT?	;CHECK SCAN #4
58	01757	000003	I		
59	01760	062677	IORST		
60	01761	006120	JSR@	IDELA	

0031 PTID

01		LINE	4		;TS0, LINE 4
02		ADROUT			
03	01762 030071	LDA	2, BDADR		; ADDRESS CORRECT
04	01763 071034	DOR	2, MUX		; BOARD
05	01764 024334	LDA	1, CM4		
06		CLOCK	32		; FULL CYCLE
07	01765 020257	LDA	0, C32		
08	01766 006117	JSR	@ICONT		
09	01767 125404	INC	1, 1, SZR		
10	01770 000775	JMP	. -3		
11		SDONE			
12		ADROUT			
13	01771 030071	LDA	2, BDADR		; ADDRESS CORRECT
14	01772 071034	DOR	2, MUX		; BOARD
15	01773 020063	LDA	0, K400		; SET "DONE" FLOP
16	01774 063034	DOC	0, MUX		; ARTIFICIALLY
17	01775 060434	DIA	0, MUX		
18	01776 024061	LDA	1, BMASK		
19	01777 123400	AND	1, 0		; MASK SCAN
20	02000 024263	LDA	1, C10		
21	02001 133000	ADD	1, 2		
22	02002 142414	SUB#	2, 0, SZR		; IS SCAN 4
23	02003 006230	EHALT			; NO, CHECK SCAN ADDRESS
24	02004 006231	LOOPX			; COUNTER, MUX DINA O. C. GATE
25	02005 006226 B008:	JSR@	IENT?		; CHECK SCAN #5
26	02006 000003	I			
27	02007 062677	IORST			
28	02010 006120	JSR@	IDELA		
29		LINE	5		;TS0, LINE 5
30		ADROUT			
31	02011 030071	LDA	2, BDADR		; ADDRESS CORRECT
32	02012 071034	DOR	2, MUX		; BOARD
33	02013 024335	LDA	1, CM5		
34		CLOCK	32		; FULL CYCLE
35	02014 020257	LDA	0, C32		
36	02015 006117	JSR	@ICONT		
37	02016 125404	INC	1, 1, SZR		
38	02017 000775	JMP	. -3		
39		SDONE			
40		ADROUT			
41	02020 030071	LDA	2, BDADR		; ADDRESS CORRECT
42	02021 071034	DOR	2, MUX		; BOARD
43	02022 020063	LDA	0, K400		; SET "DONE" FLOP
44	02023 063034	DOC	0, MUX		; ARTIFICIALLY
45	02024 060434	DIA	0, MUX		
46	02025 024061	LDA	1, BMASK		
47	02026 123400	AND	1, 0		; MASK SCAN
48	02027 024265	LDA	1, C12		
49	02030 133000	ADD	1, 2		
50	02031 142414	SUB#	2, 0, SZR		; IS SCAN 5
51	02032 006230	EHALT			; NO, CHECK SCAN ADDRESS
52	02033 006231	LOOPX			; COUNTER
53					
54	02034 006226 B009:	JSR@	IENT?		; CHECK SCAN #6
55	02035 000003	I			
56	02036 062677	IORST			
57	02037 006120	JSR@	IDELA		
58		LINE	6		;TS0, LINE 6
59		ADROUT			
60	02040 030071	LDA	2, BDADR		; ADDRESS CORRECT

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0032 PTID
01 02041 071034   DOA   2, MUX           ; BOARD
02 02042 024336   LDA   1, CM6
03                CLOCK  32           ; FULL CYCLE
04 02043 020257   LDA   0, C32
05 02044 006117   JSR   @ICONT
06 02045 125404   INC   1, 1, SZR
07 02046 000775   JMP   .-3
08                SDONE
09                ADROUT
10 02047 030071   LDA   2, BDADR       ; ADDRESS CORRECT
11 02050 071034   DOA   2, MUX           ; BOARD
12 02051 020063   LDA   0, K400       ; SET "DONE" FLOP
13 02052 063034   DOC   0, MUX         ; ARTIFICIALLY
14 02053 060434   DIA   0, MUX
15 02054 024061   LDA   1, BMASK
16 02055 123400   AND   1, 0
17 02056 024266   LDA   1, C14
18 02057 133000   ADD   1, 2
19 02060 142414   SUB#  2, 0, SZR      ; IS SCAN 6I
20 02061 006230   EHALT                ; NO, CHECK SCAN ADDRESS
21 02062 006231   LOOPX                ; COUNTER
22 02063 006226 B010: JSR@   IENT?      ; CHECK SCAN #7
23 02064 000003   I
24 02065 062677   IORST
25 02066 006120   JSR@   IDELA
26                LINE   7           ; TSO, LINE 7
27                ADROUT
28 02067 030071   LDA   2, BDADR       ; ADDRESS CORRECT
29 02070 071034   DOA   2, MUX           ; BOARD
30 02071 024337   LDA   1, CM7
31                CLOCK  32           ; FULL CYCLE
32 02072 020257   LDA   0, C32
33 02073 006117   JSR   @ICONT
34 02074 125404   INC   1, 1, SZR
35 02075 000775   JMP   .-3
36                SDONE
37                ADROUT
38 02076 030071   LDA   2, BDADR       ; ADDRESS CORRECT
39 02077 071034   DOA   2, MUX           ; BOARD
40 02100 020063   LDA   0, K400       ; SET "DONE" FLOP
41 02101 063034   DOC   0, MUX         ; ARTIFICIALLY
42 02102 060434   DIA   0, MUX
43 02103 024061   LDA   1, BMASK
44 02104 123400   AND   1, 0
45 02105 024267   LDA   1, C16
46 02106 133000   ADD   1, 2
47 02107 142414   SUB#  2, 0, SZR      ; IS SCAN 7
48 02110 006230   EHALT                ; NO, CHECK SCAN ADDRESS
49 02111 006231   LOOPX                ; COUNTER
50                B010C: SCAN  8, 20
51 02112 006226   JSR@   IENT?      ; CHECK SCAN #8.
52 02113 000003   I
53 02114 062677   IORST
54 02115 006120   JSR@   IDELA
55                LINE   8.
56                ADROUT
57 02116 030071   LDA   2, BDADR       ; ADDRESS CORRECT
58 02117 071034   DOA   2, MUX           ; BOARD
59 02120 024340   LDA   1, CM8
60                CLOCK  32           ; FULL CYCLE

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0033 PTID
01 02121 020257 LDA 0,C32
02 02122 006117 JSR @ICONT
03 02123 125404 INC 1,1,SZR
04 02124 000775 JMP .-3
05 SDONE
06 ADROUT
07 02125 030071 LDA 2,BDADR ;ADDRESS CORRECT
08 02126 071034 DOR 2,MUX ;BOARD
09 02127 020063 LDA 0,K400 ;SET "DONE" FLOP
10 02130 063034 DOC 0,MUX ;ARTIFICIALLY
11 02131 060434 DIA 0,MUX
12 02132 024061 LDA 1,BMASK
13 02133 123400 AND 1,0
14 02134 024271 LDA 1,C20
15 02135 133000 ADD 1,2
16 02136 142414 SUB# 2,0,SZR ;IS SCAN 8.?
17 02137 006230 EHALT ;NO, CHECK SCAN
18 LOOP ;ADDRESS COUNTER
19 02140 006227 JSR @ICYC?E ;END OF SUBTEST
20
21
22 B0100: SCAN 9,22
23 02141 006226 JSR@ IENT? ;CHECK SCAN #9.
24 02142 000003 I
25 02143 062677 IORST
26 02144 006120 JSR@ IDELA
27 LINE 9.
28 ADROUT
29 02145 030071 LDA 2,BDADR ;ADDRESS CORRECT
30 02146 071034 DOR 2,MUX ;BOARD
31 02147 024342 LDA 1,CM9.
32 CLOCK 32. ;FULL CYCLE
33 02150 020257 LDA 0,C32
34 02151 006117 JSR @ICONT
35 02152 125404 INC 1,1,SZR
36 02153 000775 JMP .-3
37 SDONE
38 ADROUT
39 02154 030071 LDA 2,BDADR ;ADDRESS CORRECT
40 02155 071034 DOR 2,MUX ;BOARD
41 02156 020063 LDA 0,K400 ;SET "DONE" FLOP
42 02157 063034 DOC 0,MUX ;ARTIFICIALLY
43 02160 060434 DIA 0,MUX
44 02161 024061 LDA 1,BMASK
45 02162 123400 AND 1,0
46 02163 024273 LDA 1,C22
47 02164 133000 ADD 1,2
48 02165 142414 SUB# 2,0,SZR ;IS SCAN 9.?
49 02166 006230 EHALT ;NO, CHECK SCAN
50 LOOP ;ADDRESS COUNTER
51 02167 006227 JSR @ICYC?E ;END OF SUBTEST
52
53 B010E: SCAN 10,24
54 02170 006226 JSR@ IENT? ;CHECK SCAN #10.
55 02171 000003 I
56 02172 062677 IORST
57 02173 006120 JSR@ IDELA
58 LINE 10.
59 ADROUT
60 02174 030071 LDA 2,BDADR ;ADDRESS CORRECT

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0034 PTID
01 02175 071034 D0A 2, MUX ; BOARD
02 02176 024341 LDA 1, CM10.
03 CLOCK 32 ; FULL CYCLE
04 02177 020257 LDA 0, C32.
05 02200 006117 JSR @ICONT
06 02201 125404 INC 1, 1, SZR
07 02202 000775 JMP .-3
08 SDONE
09 ADDR0UT
10 02203 030071 LDA 2, B0ADR ; ADDRESS CORRECT
11 02204 071034 D0A 2, MUX ; BOARD
12 02205 020063 LDA 0, K400 ; SET "DONE" FLOP
13 02206 063034 D0C 0, MUX ; ARTIFICIALLY
14 02207 060434 D1A 0, MUX
15 02210 024061 LDA 1, BMASK
16 02211 123400 AND 1, 0
17 02212 024274 LDA 1, C24
18 02213 133000 ADD 1, 2
19 02214 142414 SUB# 2, 0, SZR ; IS SCAN 10 ?
20 02215 006230 EHALL ; NO, CHECK SCAN
21 LOOP ; ADDRESS COUNTER
22 02216 006227 JSR @ICYC?E ; END OF SUBTEST
23
24
25 B010F: SCAN 11, 26
26 02217 006226 JSR@ IENT? ; CHECK SCAN #11
27 02220 000003 I
28 02221 062677 IORST
29 02222 006120 JSR@ IDELA
30 LINE 11
31 ADDR0UT
32 02223 030071 LDA 2, B0ADR ; ADDRESS CORRECT
33 02224 071034 D0A 2, MUX ; BOARD
34 02225 024343 LDA 1, CM11.
35 CLOCK 32 ; FULL CYCLE
36 02226 020257 LDA 0, C32.
37 02227 006117 JSR @ICONT
38 02230 125404 INC 1, 1, SZR
39 02231 000775 JMP .-3
40 SDONE
41 ADDR0UT
42 02232 030071 LDA 2, B0ADR ; ADDRESS CORRECT
43 02233 071034 D0A 2, MUX ; BOARD
44 02234 020063 LDA 0, K400 ; SET "DONE" FLOP
45 02235 063034 D0C 0, MUX ; ARTIFICIALLY
46 02236 060434 D1A 0, MUX
47 02237 024061 LDA 1, BMASK
48 02240 123400 AND 1, 0
49 02241 024276 LDA 1, C26
50 02242 133000 ADD 1, 2
51 02243 142414 SUB# 2, 0, SZR ; IS SCAN 11 ?
52 02244 006230 EHALL ; NO, CHECK SCAN
53 LOOP ; ADDRESS COUNTER
54 02245 006227 JSR @ICYC?E ; END OF SUBTEST
55
56 B010G: SCAN 12, 30
57 02246 006226 JSR@ IENT? ; CHECK SCAN #12
58 02247 000003 I
59 02250 062677 IORST
60 02251 006120 JSR@ IDELA

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0035 PTID

01		LINE	12	
02		ADROUT		
03	02252 030071	LDA	2, BDADR	; ADDRESS CORRECT
04	02253 071034	DOR	2, MUX	; BOARD
05	02254 024344	LDA	1, CML2	
06		CLOCK	32	; FULL CYCLE
07	02255 020257	LDA	0, C32	
08	02256 006117	JSR	@ICONT	
09	02257 125404	INC	1, 1, SZR	
10	02260 000775	JMP	. -3	
11		SDONE		
12		ADROUT		
13	02261 030071	LDA	2, BDADR	; ADDRESS CORRECT
14	02262 071034	DOR	2, MUX	; BOARD
15	02263 020063	LDA	0, K400	; SET "DONE" FLOP
16	02264 063034	DOR	0, MUX	; ARTIFICIALLY
17	02265 060434	DIA	0, MUX	
18	02266 024061	LDA	1, BMASK	
19	02267 123400	AND	1, 0	
20	02270 024277	LDA	1, C30	
21	02271 133000	ADD	1, 2	
22	02272 142414	SUB#	2, 0, SZR	; IS SCAN 12 ?
23	02273 006230	EHALT		; NO, CHECK SCAN
24		LOOP		; ADDRESS COUNTER
25	02274 006227	JSR	@ICYC?E	; END OF SUBTEST
26				
27				
28	B010H:	SCAN	13, 32	
29	02275 006226	JSR@	IEN?T?	; CHECK SCAN #13.
30	02276 000003	I		
31	02277 062677	IORST		
32	02300 006120	JSR@	IDELA	
33		LINE	13.	
34		ADROUT		
35	02301 030071	LDA	2, BDADR	; ADDRESS CORRECT
36	02302 071034	DOR	2, MUX	; BOARD
37	02303 024345	LDA	1, CML3.	
38		CLOCK	32	; FULL CYCLE
39	02304 020257	LDA	0, C32	
40	02305 006117	JSR	@ICONT	
41	02306 125404	INC	1, 1, SZR	
42	02307 000775	JMP	. -3	
43		SDONE		
44		ADROUT		
45	02310 030071	LDA	2, BDADR	; ADDRESS CORRECT
46	02311 071034	DOR	2, MUX	; BOARD
47	02312 020063	LDA	0, K400	; SET "DONE" FLOP
48	02313 063034	DOR	0, MUX	; ARTIFICIALLY
49	02314 060434	DIA	0, MUX	
50	02315 024061	LDA	1, BMASK	
51	02316 123400	AND	1, 0	
52	02317 024301	LDA	1, C32	
53	02320 133000	ADD	1, 2	
54	02321 142414	SUB#	2, 0, SZR	; IS SCAN 13. ?
55	02322 006230	EHALT		; NO, CHECK SCAN
56		LOOP		; ADDRESS COUNTER
57	02323 006227	JSR	@ICYC?E	; END OF SUBTEST
58				
59	B010J:	SCAN	14, 34	
60	02324 006226	JSR@	IEN?T?	; CHECK SCAN #14.

0036 PTID

01	02325	000003	I		
02	02326	062677	IORST		
03	02327	006120	JSR@	IDELA	
04			LINE	14.	
05			ADROUT		
06	02330	030071	LDA	2, BDADR	; ADDRESS CORRECT
07	02331	071034	DOR	2, MUX	; BOARD
08	02332	024346	LDA	1, CM14.	
09			CLOCK	32.	; FULL CYCLE
10	02333	020257	LDA	0, C32.	
11	02334	006117	JSR	@ICONT	
12	02335	125404	INC	1, 1, SZR	
13	02336	000775	JMP	.-3	
14			SDONE		
15			ADROUT		
16	02337	030071	LDA	2, BDADR	; ADDRESS CORRECT
17	02340	071034	DOR	2, MUX	; BOARD
18	02341	020063	LDA	0, K400	; SET "DONE" FLOP
19	02342	063034	DOC	0, MUX	; ARTIFICIALLY
20	02343	060434	DIA	0, MUX	
21	02344	024061	LDA	1, BMASK	
22	02345	123400	AND	1, 0	
23	02346	024302	LDA	1, C34	
24	02347	133000	ADD	1, 2	
25	02350	142414	SUB#	2, 0, SZR	; IS SCAN 14. ?
26	02351	006230	EHALT		; NO, CHECK SCAN
27			LOOP		; ADDRESS COUNTER
28	02352	006227	JSR	@ICYC?E	; END OF SUBTEST
29					
30					
31		B010K:	SCAN	15, 36	
32	02353	006226	JSR@	IENT?	; CHECK SCAN #15.
33	02354	000003	I		
34	02355	062677	IORST		
35	02356	006120	JSR@	IDELA	
36			LINE	15.	
37			ADROUT		
38	02357	030071	LDA	2, BDADR	; ADDRESS CORRECT
39	02360	071034	DOR	2, MUX	; BOARD
40	02361	024347	LDA	1, CM15.	
41			CLOCK	32.	; FULL CYCLE
42	02362	020257	LDA	0, C32.	
43	02363	006117	JSR	@ICONT	
44	02364	125404	INC	1, 1, SZR	
45	02365	000775	JMP	.-3	
46			SDONE		
47			ADROUT		
48	02366	030071	LDA	2, BDADR	; ADDRESS CORRECT
49	02367	071034	DOR	2, MUX	; BOARD
50	02370	020063	LDA	0, K400	; SET "DONE" FLOP
51	02371	063034	DOC	0, MUX	; ARTIFICIALLY
52	02372	060434	DIA	0, MUX	
53	02373	024061	LDA	1, BMASK	
54	02374	123400	AND	1, 0	
55	02375	024303	LDA	1, C36	
56	02376	133000	ADD	1, 2	
57	02377	142414	SUB#	2, 0, SZR	; IS SCAN 15. ?
58	02400	006230	EHALT		; NO, CHECK SCAN
59			LOOP		; ADDRESS COUNTER
60	02401	006227	JSR	@ICYC?E	; END OF SUBTEST

0037 PTID

```

01
02 02402 006226 B010A: JSR@ IENT?
03 02403 000003 I
04 02404 062677 IORST
05 02405 006120 JSR@ IDELA
06 LINE 16. ; CYCLE 16 LINES
07 ADROUT
08 02406 030071 LDA 2, B0ADR ; ADDRESS CORRECT
09 02407 071034 DOR 2, MUX ; BOARD
10 02410 024350 LDA 1, CM16.
11 CLOCK 32. ; FULL CYCLE
12 02411 020257 LDA 0, C32
13 02412 006117 JSR @ICONT
14 02413 125404 INC 1, 1, SZR
15 02414 000775 JMP .-3
16 SDONE
17 ADROUT
18 02415 030071 LDA 2, B0ADR ; ADDRESS CORRECT
19 02416 071034 DOR 2, MUX ; BOARD
20 02417 020063 LDA 0, K400 ; SET "DONE" FLOP
21 02420 063034 DOC 0, MUX ; ARTIFICIALLY
22 02421 060434 DIA 0, MUX
23 02422 024061 LDA 1, BMASK
24 02423 123400 AND 1, 0
25 02424 142414 SUB# 2, 0, SZR
26 02425 006230 EHALLT ; CHECK SCAN ADDRESS
27 02426 006231 LOOPX ; COUNTER
28 02427 000411 JMP B20
29
30 02430 024072 B21XX: LDA 1, CLK0 ; ADJUST WAIT TIME (WATE)
31 ; FOR CLK0 TO RUN PROG QUICKLY
32 02431 125005 MOV 1, 1, SNR ;
33 02432 001400 JMP 0, 3 ; DON'T TOUCH IF ZERO
34 02433 020351 LDA 0, CM128 ; ==-128
35 02434 125102 MOVL 1, 1, SZC ; DONE WHEN CARRY IS SET
36 02435 001400 JMP 0, 3
37 02436 101120 MOVZL 0, 0 ; NOT DONE SHIFT ANOTHER ZERO
38 02437 000775 JMP .-3 ; IN THE COUNT
39
40 ; DETERMINE CLOCK 0 BAUD RATE
41 02440 006226 B20: JSR@ IENT?
42 02441 000003 I
43 02442 062677 IORST
44 02443 006120 JSR@ IDELA
45 ADROUT
46 02444 030071 LDA 2, B0ADR ; ADDRESS CORRECT
47 02445 071034 DOR 2, MUX ; BOARD
48 DIAG
49 02446 020314 LDA 0, C200 ; ISSUE CLEAR WITHOUT
50 02447 063034 DOC 0, MUX ; GOING ON LINE
51 02450 020325 LDA 0, C100K
52 02451 063034 DOC 0, MUX
53 02452 020246 LDA 0, C4
54 02453 006117 JSR@ ICONT
55 02454 004560 JSR BRFD ; FIND BAUD RATE
56 02455 006230 EHALLT
57 LOOP
58 02456 006227 JSR @ICYC?E ; END OF SUBTEST
59
60 02457 020072 LDA 0, CLK0

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0038 PTID
01 02460 024110 LDA 1,TEMP
02 02461 101005 MOV 0,0,SNR ;FIRST TIME?
03 02462 000405 JMP B20A ;YES PRINT IT
04 02463 106414 SUB# 0,1,SZR ;SAME RATE?
05 02464 006230 EHALT ;BAUD RATE CHANGING
06 LOOP
07 02465 006227 JSR @ICYC?E ;END OF SUBTEST
08
09 02466 000406 JMP B21X
10
11 02467 044072 B20A: STA 1,CLK0 ;KEEP NEW CLK0
12 02470 006215 JSR@ IMES? ;PRINT HEADER
13 02471 007116 C0BR
14 02472 004536 JSR PBRT ;CALCULATE/PRINT BAUD RATE
15 B20B: LOOP
16 02473 006227 JSR @ICYC?E ;END OF SUBTEST
17
18
19 02474 004734 B21X: JSR B21XX ;CAL WAIT CONSTANT
20 02475 040112 STA 0,WATE ;KEEP
21
22
23 ; DETERMINE CLOCK 1 BAUD RATE
24 02476 006226 B21: JSR@ IENT?
25 02477 000003 I
26 02500 062677 IORST
27 02501 006120 JSR@ IDELA
28 ADROUT
29 02502 030071 LDA 2,BDADR ;ADDRESS CORRECT
30 02503 071034 D0A 2,MUX ;BOARD
31 DIAG
32 02504 020314 LDA 0,C200 ;ISSUE CLEAR WITHOUT
33 02505 063034 DOC 0,MUX ;GOING ON LINE
34 02506 020326 LDA 0,C1002
35 02507 063034 DOC 0,MUX
36 02510 020246 LDA 0,C4
37 02511 006117 JSR@ ICONT
38 02512 004522 JSR BRFD ;FIND BAUD RATE
39 02513 006230 EHALT
40 LOOP
41 02514 006227 JSR @ICYC?E ;END OF SUBTEST
42
43 02515 020073 LDA 0,CLK1
44 02516 024110 LDA 1,TEMP
45 02517 101005 MOV 0,0,SNR ;FIRST TIME?
46 02520 000405 JMP B21A ;YES PRINT IT
47 02521 106414 SUB# 0,1,SZR ;SAME RATE?
48 02522 006230 EHALT ;BAUD RATE CHANGING
49 LOOP
50 02523 006227 JSR @ICYC?E ;END OF SUBTEST
51
52 02524 000406 JMP B22
53
54 02525 044073 B21A: STA 1,CLK1 ;KEEP NEW CLK1
55 02526 006215 JSR@ IMES?
56 02527 007131 C1BR
57 02530 004500 JSR PBRT ;CAL PRINT BAUD RATE
58 B21B: LOOP
59 02531 006227 JSR @ICYC?E ;END OF SUBTEST
60

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0039 PTID

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01
02           ; DETERMINE CLOCK 2 BAUD RATE
03 02532 006226 B22: JSR@   IENT?
04 02533 000003      I
05 02534 062677      IORST
06 02535 006120      JSR@   IDELA
07           ADROUT
08 02536 030071      LDA    2, BDADR      ; ADDRESS CORRECT
09 02537 071034      DOR    2, MUX        ; BOARD
10           DIAG
11 02540 020314      LDA    0, C200      ; ISSUE CLEAR WITHOUT
12 02541 063034      DOC    0, MUX        ; GOING ON LINE
13 02542 020327      LDA    0, C1004
14 02543 063034      DOC    0, MUX
15 02544 020246      LDA    0, C4
16 02545 006117      JSR@   ICONT
17 02546 004466      JSR    BRFD          ; FIND BAUD RATE
18 02547 006230      EHALT
19           LOOP
20 02550 006227      JSR    @ICYC?E      ; END OF SUBTEST
21
22 02551 024110      LDA    1, TEMP
23 02552 020074      LDA    0, CLK2
24 02553 101005      MOV    0, 0, SNR      ; FIRST TIME?
25 02554 000405      JMP    B22A          ; YES PRINT IT
26 02555 106414      SUB#   0, 1, SZR      ; SAME RATE?
27 02556 006230      EHALT          ; BAUD RATE CHANGING
28           LOOP
29 02557 006227      JSR    @ICYC?E      ; END OF SUBTEST
30
31 02560 000406      JMP    B23
32
33 02561 044074 B22A: STA    1, CLK2      ; KEEP NEW CLK2
34 02562 006215      JSR@   IMES?
35 02563 007144      C2BR
36 02564 004444      JSR    PBRT
37           LOOP
38 02565 006227      JSR    @ICYC?E      ; END OF SUBTEST
39
40           ; DETERMINE CLOCK 3 BAUD RATE
41 02566 006226 B23: JSR@   IENT?
42 02567 000003      I
43 02570 062677      IORST
44 02571 006120      JSR@   IDELA
45           ADROUT
46 02572 030071      LDA    2, BDADR      ; ADDRESS CORRECT
47 02573 071034      DOR    2, MUX        ; BOARD
48           DIAG
49 02574 020314      LDA    0, C200      ; ISSUE CLEAR WITHOUT
50 02575 063034      DOC    0, MUX        ; GOING ON LINE
51 02576 020330      LDA    0, C1006
52 02577 063034      DOC    0, MUX
53 02600 020246      LDA    0, C4
54 02601 006117      JSR@   ICONT
55 02602 004432      JSR    BRFD          ; FIND BAUD RATE
56 02603 006230      EHALT
57           LOOP
58 02604 006227      JSR    @ICYC?E      ; END OF SUBTEST
59
60 02605 024110      LDA    1, TEMP

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0040 PTID

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01 02606 020075 LDA 0, CLK3
02 02607 101005 MOV 0, 0, SNR ; FIRST TIME?
03 02610 000405 JMP B23A ; YES PRINT IT
04 02611 106414 SUB# 0, 1, SZR ; SAME RATE?
05 02612 006230 EHALT ; BAUD RATE CHANGING
06 LOOP
07 02613 006227 JSR @ICYC?E ; END OF SUBTEST
08
09 02614 000406 JMP BDRNN
10
11 02615 044075 B23A: STA 1, CLK3 ; KEEP NEW CLK3
12 02616 006215 JSR@ IMES? ; PRINT IF GOOD VALUE
13 02617 007157 C3BR
14 02620 004410 JSR PBRT ; CALC /PRINT BAUD RATE
15 LOOP
16 02621 006227 JSR @ICYC?E ; END OF SUBTEST
17
18 02622 020130 BDRNN: LDA 0, BDCKK ; BAUD ONLY FLAG
19 02623 101005 MOV 0, 0, SNR ; BAUD CLOCK ONLY?
20 02624 000571 JMP C000 ; NO
21 02625 002401 JMP@ .+1
22 02626 006717 DLP
23
24 ; PRINT THE BAUD RATE
25 02627 000000 0
26 02630 054777 BRD: STA 3, -1
27 02631 006220 JSR@ IPDE? ; PRINT IT
28 02632 002775 JMP@ PBRT-1 ; RETURN
29
30 ; FIND BAUD RATE ROUTINE, COUNT CLOCK
31 ; TRANSITIONS FOR THE FIRST 100000 P
32 ; PULSES. THROW AWAY THE FIRST FOUR 100000 PULSES.
33
34 02633 000000 0
35 02634 054777 BRFD: STA 3, -1 ; KEEP RETURN
36 02635 102400 SUB 0, 0
37 02636 040110 STA 0, TEMP
38 02637 126420 SUBZ 1, 1 ; SET CARRY CLEAR 1
39 02640 004421 JSR BRFD1
40 02641 004420 JSR BRFD1
41 02642 102400 SUB 0, 0 ; DON'T RUN OUT OF IOPLS AT 50
42 02643 004416 JSR BRFD1
43 02644 004415 JSR BRFD1
44 02645 102400 SUB 0, 0 ; DON'T RUN OUT OF IOPLS AT 50
45 02646 004413 JSR BRFD1
46 02647 004412 JSR BRFD1 ; THROW AWAY FIRST FOUR
47 02650 102400 SUB 0, 0
48 02651 040110 STA 0, TEMP ; CLEAR COUNTER
49 02652 004407 JSR BRFD1 ; COUNT FOR ONE CYCLE
50 02653 101113 MOVL# 0, 0, SNC ; ALL DONE?
51 02654 000776 JMP .-2 ; NO
52 02655 004430 JSR ATT ; GO ADD TOLERANCES
53 02656 034755 LDA 3, BRFD-1 ; YES, EXIT
54 02657 001402 JMP 2, 3
55
56 02660 000000 0
57 02661 054777 BRFD1: STA 3, -1 ; KEEP RETURN
58 02662 004413 JSR BRFD5 ; GO PULSE AND TEST
59 02663 151202 MOVR 2, 2, SZC ; CLOCK LOW SKIP
60 02664 000776 JMP BRFD1+1 ; NOT LOW PULSE AGAIN
```



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0041 PTID
01 02665 010110      ISZ   TEMP           ; SWITCHED LOW COUNT
02 02666 101112      MOVL# 0, 0, SZC     ; DONE WITH 100000?
03 02667 002771      JMP@  BRFD1-1
04 02670 004405 BRFD2: JSR   BRFD5           ; PULSE AND TEST
05 02671 151203      MOVR  2, 2, SNC     ; CLOCK HIGH SKIP
06 02672 000776      JMP   BRFD2         ; NOT HIGH PULSE AGAIN
07 02673 010110      ISZ   TEMP           ; SWITCHED HIGH COUNT
08 02674 002764      JMP@  BRFD1-1
09 02675 101405 BRFD5: INC   0, 0, SNR           ;
10 02676 002735      JMP@  BRFD-1
11 02677 060334      NIOP  MUX
12 02700 072434      DIC   2, MUX        ; BIT 7 CLOCK
13 02701 151300      MOVS  2, 2          ; BIT 7 AT BIT 15 POSITION
14 02702 001400      JMP   0, 3         ; RETURN
15
16 02703 000003 I: ALLOWS FOR A + OR - ONE TOLERANCE IN COUNT FOR BAUD RATES.
17                ; IF NOT WITHIN TOLERANCE COUNT IS X BY 8 FOR OUTPUT
18 02704 000000 0
19 02705 054777 ATT:  STA   3, -1         ; KEEP RETURN
20 02706 020504      LDA   0, TPLUS     ; GET BEGINNING OF RATE TABLE
21 02707 040442      STA   0, TABLE    ; TO INITIALIZE POINTER
22 02710 102400      SUB   0, 0
23 02711 040503      STA   0, NCONS     ; CLEAR CONSTANT COUNTER
24 02712 022437 TADD: LDA   0, @TABLE    ; GET COUNT CONSTANT
25 02713 101400      INC   0, 0         ; TOLERANCE OF +1 ON COUNT
26 02714 024110      LDA   1, TEMP      ; GET TRANSITIONS PER 100000 IOPLS
27 02715 122422      SUBZ  1, 0, SZC    ; IF COUNT GREATER SKIP
28 02716 000410      JMP   SMALL
29 02717 020474      LDA   0, .STOP     ; END OF RATE TABLE
30 02720 024431      LDA   1, TABLE
31 02721 106405      SUB   0, 1, SNR    ; REACHED
32 02722 000421      JMP   SAVETP       ; NO MATCH?
33 02723 010426      ISZ   TABLE       ; NEXT CONSTANT
34 02724 010470      ISZ   NCONS        ; # OF CONSTANT
35 02725 000765      JMP   TADD
36 02726 022423 SMALL: LDA   0, @TABLE    ; GET RATE CONSTANT
37 02727 024110      LDA   1, TEMP      ; COUNT
38 02730 125400      INC   1, 1         ; TOLERANCE OF -1 ON COUNT
39 02731 125400      INC   1, 1
40 02732 122422      SUBZ  1, 0, SZC    ; SKIP IF COUNT GREATER
41 02733 000410      JMP   SAVETP       ; COUNT IS NOT WITHIN A BAUD RANGE
42 02734 020415      LDA   0, TABLE    ; POINTER AT COUNT CONSTANT
43 02735 024271      LDA   1, C20
44 02736 123000      ADD   1, 0
45 02737 040412      STA   0, TABLE    ; POINTER AT BAUD RATE OUTPUT CONSTANT
46 02740 022411      LDA   0, @TABLE
47 02741 040110      STA   0, TEMP      ; COUNT WITHIN LIMITS, SAY PERFECT
48 02742 000406      JMP   .+6          ; JUMP TO RETURN
49 02743 020110 SAVETP: LDA   0, TEMP      ; GET COUNT
50 02744 101120      MOVZL 0, 0
51 02745 101120      MOVZL 0, 0
52 02746 101120      MOVZL 0, 0         ; X 8.
53 02747 040110      STA   0, TEMP      ; TO BE OUTPUT
54 02750 002734      JMP@  ATT-1        ; RTN
55 02751 002752 TABLE: TPLUS
56 02752 000005 TPLUS: 5      ; 50
57 02753 000010      10     ; 75
58 02754 000013      13     ; 110
59 02755 000016      16     ; 134.5
60 02756 000021      21     ; 150

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0042 PTID

01	02757	000040	40	; 300
02	02760	000100	100	; 600
03	02761	000200	200	; 1200
04	02762	000300	300	; 1800
05	02763	000326	326	; 2000
06	02764	000400	400	; 2400
07	02765	000602	602	; 3600
08	02766	001000	1000	; 4800
09	02767	001372	1372	; 7200
10	02770	002000	2000	; 9600
11	02771	004000	STOP: 4000	; 19. 2
12	02772	000062	50.	
13	02773	000113	75.	
14	02774	000156	110.	
15	02775	000206	134.	
16	02776	000226	150.	
17	02777	000454	300.	
18	03000	001130	600.	
19	03001	002260	1200.	
20	03002	003410	1800.	
21	03003	003720	2000.	
22	03004	004540	2400.	
23	03005	007020	3600.	
24	03006	011300	4800.	
25	03007	016040	7200.	
26	03010	022600	9600.	
27	03011	045400	19200.	
28	03012	002752	. TPLUS: TPLUS	
29	03013	002771	. STOP: STOP	
30	03014	000000	NCONS: 0	

0043 PTID

```
01 ; TRANSMITTER/RECEIVER CONTROL LOGIC CHECKOUT
02
03 03015 006226 C000: JSR@ IENT?
04 03016 000003 I
05 03017 062677 IORST
06 03020 024334 LDA 1, CM4
07 03021 044110 STA 1, TEMP
08 03022 020324 LDA 0, C400
09 03023 040100 STA 0, TEM
10 03024 006120 JSR@ IDELA
11 SDONE
12 ADROUT
13 03025 030071 LDA 2, BDADR ; ADDRESS CORRECT
14 03026 071034 DOR 2, MUX ; BOARD
15 03027 020063 LDA 0, K400 ; SET "DONE" FLOP
16 03030 063034 DOC 0, MUX ; ARTIFICIALLY
17 03031 020100 LDA 0, TEM ; CLEAR BOARD ENABLE BY
18 03032 024071 LDA 1, BDADR ; ADDRESSING ANOTHER DEVICE
19 03033 131000 MOV 1, 2
20 03034 113520 ANDZL 0, 2
21 03035 107000 ADD 0, 1
22 03036 146400 SUB 2, 1
23 03037 065034 DOR 1, MUX ; BUT LEAVE DONE SET
24 03040 024314 LDA 1, C200 ; ISSUE CLEAR WITHOUT
25 03041 067034 DOC 1, MUX ; GOING ON LINE
26 03042 125100 MOVL 1, 1 ; DUMMY INSTRUCTION
27 03043 063634 SKPDN MUX ; CLEAR DONE, USING WRONG
28 ; BOARD ADDRESS
29 03044 006230 EHALLT ; DONE CLEARED, BOARD
30 03045 101220 MOVZR 0, 0 ; ADDRESS DECODER
31 03046 010110 ISZ TEMP
32 03047 000753 JMP C000+5
33 03050 006231 LOOPX ; DIA INPUT TO B0EN
34
35 03051 006226 C001: JSR@ IENT?
36 03052 000003 I
37 03053 062677 IORST
38 03054 006120 JSR@ IDELA
39 SDONE
40 ADROUT
41 03055 030071 LDA 2, BDADR ; ADDRESS CORRECT
42 03056 071034 DOR 2, MUX ; BOARD
43 03057 020063 LDA 0, K400 ; SET "DONE" FLOP
44 03060 063034 DOC 0, MUX ; ARTIFICIALLY
45 03061 060434 DIA 0, MUX ; CHECK BIT 15 OFF
46 03062 101232 MOVZR# 0, 0, SZC
47 03063 006230 EHALLT ; MUX DINA O. C. GATE WITH BIT 15,
48 03064 006231 LOOPX ; SXMOD FLOP, INTERRUPT PRIORITY
49 ; LOGIC
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!0044 PTID

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01 03065 006226 C002: JSR@ IENT?
02 03066 000003 I
03 03067 062677 IORST
04 03070 006120 JSR@ IDELA
05 SDONE
06 ADROUT
07 03071 030071 LDA 2, B0ADR ; ADDRESS CORRECT
08 03072 071034 D0A 2, MUX ; BOARD
09 03073 020063 LDA 0, K400 ; SET "DONE" FLOP
10 03074 063034 DOC 0, MUX ; ARTIFICIALLY
11 03075 024071 LDA 1, B0ADR ; CLEAR BOARD ENABLE BY
12 03076 020311 LDA 0, C100 ; ADDRESSING ANOTHER DEVICE
13 03077 107000 ADD 0, 1
14 03100 065034 D0A 1, MUX
15 03101 064434 DIA 1, MUX ; RE-ESTABLISH BOARD ADDRESS
16 03102 024314 LDA 1, C200 ; WITH DIA AND CLEAR DONE
17 03103 067034 DOC 1, MUX
18 03104 063734 SKPDZ MUX
19 03105 006230 EHALLT ; DONE NOT CLEARED, CHECK
20 03106 006231 LOOPX ; DIA INPUT TO B0EN
21
22 03107 006226 C004: JSR@ IENT?
23 03110 000003 I
24 03111 062677 IORST
25 03112 006120 JSR@ IDELA
26 ADROUT
27 03113 030071 LDA 2, B0ADR ; ADDRESS CORRECT
28 03114 071034 D0A 2, MUX ; BOARD
29 DIAG ; CLEAR BUFFERS
30 03115 020314 LDA 0, C200 ; ISSUE CLEAR WITHOUT
31 03116 063034 DOC 0, MUX ; GOING ON LINE
32 03117 061434 DIB 0, MUX ; CHECK DATA BITS
33 03120 101004 MOV 0, 0, SZR ; SET
34 03121 006230 EHALLT ; DIB BUFFERS
35 03122 006231 LOOPX ; DIB O. C. GATES,
36
37 03123 006226 C005: JSR@ IENT?
38 03124 000003 I
39 03125 062677 IORST
40 03126 006120 JSR@ IDELA
41 ADROUT
42 03127 030071 LDA 2, B0ADR ; ADDRESS CORRECT
43 03130 071034 D0A 2, MUX ; BOARD
44 DIAG ; CLEAR BUFFERS
45 03131 020314 LDA 0, C200 ; ISSUE CLEAR WITHOUT
46 03132 063034 DOC 0, MUX ; GOING ON LINE
47
48 03133 062434 DIC 0, MUX ; CHECK STATUS BITS WITH DONE
49 03134 024304 LDA 1, C37
50 03135 123414 AND# 1, 0, SZR ; SET
51 03136 006230 EHALLT ; DIC BUFFERS,
52 03137 006231 LOOPX ; INTER PRIORITY LOGIC
53 ; DIC O. C. GATES,
54 03140 006226 C006: JSR@ IENT?
55 03141 000003 I
56 03142 062677 IORST
57 03143 006120 JSR@ IDELA
58 03144 062677 IORST
59 03145 006120 JSR@ IDELA
60 03146 020105 LDA 0, OADR
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0045 PTID
01 03147 101400      INC      0,0          ;OUTPUT TO TRANSMIT MODE
02 03150 061034      DOR      0,MUX
03 03151 102520      SUBZL    0,0          ;TURN TRANSMITTER ON
04 03152 063034      DOC      0,MUX
05                   TIM6     PRIMLINE
06                   ADROUT    ;PAST TIM2 LATCHING AND TIM6
07 03153 030071      LDA      2,BDADR     ;ADDRESS CORRECT
08 03154 071034      DOR      2,MUX       ;BOARD
09                   ;DONE SETTING PULSES
10                   CLOCK    31
11 03155 020260      LDA      0,C31
12 03156 006117      JSR      @ICONT
13                   TCYCLE    PRIMLINE
14                   ADROUT
15 03157 030071      LDA      2,BDADR     ;ADDRESS CORRECT
16 03160 071034      DOR      2,MUX       ;BOARD
17 03161 024104      LDA      1,PRIMLINE ;CYCLE TIME STATE
18 03162 125405      INC      1,1,SNR     ;COUNTER TO BEGINNING
19 03163 000404      JMP      .+4         ;OF PRIMLINE
20                   CLOCK    32
21 03164 020257      LDA      0,C32
22 03165 006117      JSR      @ICONT
23 03166 000774      JMP      .-4
24 03167 063634      SKPDN   MUX          ;SHOULD GET UNDERRUN
25                   ;*****
26                   ;***** CLEAR TO SEND TESTING MESSAGE *****
27                   ;*****
28 03170 006241      JSR@     ICTS        ;CHECK UAR/T,
29 03171 006231      LOOPX   ;PRIORITY LOGIC, EX XMTR/RECYR, EX ADDR'S
30                   ;POLL X ALWAYS ON, OR POINTING
31                   ;TO WRONG UAR/T, XMIT REPEAT MASK ON
32 03172 006226 C06B: JSR@     IENT?    ;DON'T SET DONE UNLESS
33 03173 000003      I
34 03174 062677      IORST
35 03175 006120      JSR@     IDELA      ;MUXENAB TO IOPLS
36 03176 030105      LDA      2,OUADR
37 03177 151400      INC      2,2          ;TURN XMITTER ON
38 03200 071034      DOR      2,MUX
39 03201 102520      SUBZL    0,0
40 03202 063034      DOC      0,MUX
41 03203 024305      LDA      1,C40       ;ADDRESS ANOTHER BOARD
42 03204 133000      ADD      1,2          ;(RESETS BOEN AND DISABLES
43 03205 071034      DOR      2,MUX       ; MUX)
44                   CLOCK    31          ;NOW CLOCK
45 03206 020260      LDA      0,C31
46 03207 006117      JSR      @ICONT
47 03210 024104      LDA      1,PRIMLINE
48 03211 125405      INC      1,1,SNR
49 03212 000404      JMP      .+4
50                   CLOCK    32
51 03213 020257      LDA      0,C32
52 03214 006117      JSR      @ICONT
53 03215 000774      JMP      .-4
54 03216 063734      SKPDZ   MUX
55 03217 006230      EHALT   ;MUXENAB TO IOPLS
56 03220 006231      LOOPX
57 03221 006226 C06A: JSR@     IENT?    ;CHECK CLR DONE
58 03222 000003      I
59 03223 062677      IORST
60 03224 006120      JSR@     IDELA

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0046 PTID

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01 03225 020105 LDA 0, QUADR
02 03226 101400 INC 0, 0
03 03227 061034 DOR 0, MUX ; TURN TRANSMITTER ON
04 03230 102520 SUBZL 0, 0
05 03231 063034 DOC 0, MUX
06 TIM2 PRIMLINE
07 ADROUT
08 03232 030071 LDA 2, BDADR ; ADDRESS CORRECT
09 03233 071034 DOR 2, MUX ; BOARD
10 CLOCK 26. ; RUN COUNTER PAST TIM2 LATCHING PULSE.
11 03234 020255 LDA 0, C26.
12 03235 006117 JSR @ICONT
13 TCYCLE PRIMLINE ; BUT BEFORE TIM6 OF
14 ADROUT
15 03236 030071 LDA 2, BDADR ; ADDRESS CORRECT
16 03237 071034 DOR 2, MUX ; BOARD
17 03240 024104 LDA 1, PRIMLINE ; CYCLE TIME STATE
18 03241 125405 INC 1, 1, SNR ; COUNTER TO BEGINNING
19 03242 000404 JMP . +4 ; OF PRIMLINE
20 CLOCK 32.
21 03243 020257 LDA 0, C32.
22 03244 006117 JSR @ICONT
23 03245 000774 JMP . -4
24 ; PRIMLINE
25 CLOCK 5
26 03246 020247 LDA 0, C5
27 03247 006117 JSR @ICONT
28 03250 101100 MOVL 0, 0 ; DUMMY INSTRUCTION
29 03251 063634 SKPDN MUX
30 03252 006230 EHFLT ; CLR DONE ALWAYS ON, OR HIGH
31 03253 006231 LOOPX ; OUTPUT TO TIM6 AND GATE
32 ; RCVR POLL ALWAYS ON
33 03254 006226 C007: JSR@ IENT? ; TRANSMITTER IS ON FROM
34 03255 000003 I
35 03256 062677 IORST
36 03257 006120 JSR@ IDELA ; PREVIOUS TEST
37 TIM6 PRIMLINE
38 ADROUT ; PAST TIM2 LATCHING AND TIM6
39 03260 030071 LDA 2, BDADR ; ADDRESS CORRECT
40 03261 071034 DOR 2, MUX ; BOARD
41 ; DONE SETTING PULSES
42 CLOCK 31.
43 03262 020260 LDA 0, C31.
44 03263 006117 JSR @ICONT
45 TCYCLE PRIMLINE
46 ADROUT
47 03264 030071 LDA 2, BDADR ; ADDRESS CORRECT
48 03265 071034 DOR 2, MUX ; BOARD
49 03266 024104 LDA 1, PRIMLINE ; CYCLE TIME STATE
50 03267 125405 INC 1, 1, SNR ; COUNTER TO BEGINNING
51 03270 000404 JMP . +4 ; OF PRIMLINE
52 CLOCK 32.
53 03271 020257 LDA 0, C32.
54 03272 006117 JSR @ICONT
55 03273 000774 JMP . -4
56 03274 060434 DIA 0, MUX ; CHECK TRANSMIT DONE BIT
57 03275 101233 MOVZR# 0, 0, SNC
58 03276 006230 EHFLT ; TRANSMIT DONE BIT FLOP, O. C.
59 03277 006231 LOOPX ; GATE
60

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0047 PTID

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01 03300 006226 C007A: JSR@ IENT? ; CHECK THAT SCAN
02 03301 000003 I
03 03302 062677 IORST
04 03303 006120 JSR@ IDELA ; ADDRESS IS SAME AS
05 TIM6 PRIMLINE ; ADDRESS OUTPUTTED TO
06 ADROUT ; PAST TIM2 LATCHING AND TIM6
07 03304 030071 LDA 2, BDADR ; ADDRESS CORRECT
08 03305 071034 DOA 2, MUX ; BOARD
09 ; DONE SETTING PULSES
10 CLOCK 31
11 03306 020260 LDA 0, C31
12 03307 006117 JSR @ICONT
13 TCYCLE PRIMLINE
14 ADROUT
15 03310 030071 LDA 2, BDADR ; ADDRESS CORRECT
16 03311 071034 DOA 2, MUX ; BOARD
17 03312 024104 LDA 1, PRIMLINE ; CYCLE TIME STATE
18 03313 125405 INC 1, 1, SNR ; COUNTER TO BEGINNING
19 03314 000404 JMP . +4 ; OF PRIMLINE
20 CLOCK 32
21 03315 020257 LDA 0, C32
22 03316 006117 JSR @ICONT
23 03317 000774 JMP . -4
24 CLOCK 3
25 03320 020245 LDA 0, C3
26 03321 006117 JSR @ICONT
27 03322 030105 LDA 2, QUADR
28 03323 151400 INC 2, 2
29 03324 060434 DIA 0, MUX
30 03325 142414 SUB# 2, 0, SZR
31 03326 006230 EHALT ; CHECK SCAN ADDRESS COUNTER
32 03327 006231 LOOPX ; DIA, DONE(0)
33 03330 006226 C008: JSR@ IENT?
34 03331 000003 I
35 03332 062677 IORST
36 03333 006120 JSR@ IDELA
37 TIM6 PRIMLINE
38 ADROUT ; PAST TIM2 LATCHING AND TIM6
39 03334 030071 LDA 2, BDADR ; ADDRESS CORRECT
40 03335 071034 DOA 2, MUX ; BOARD
41 ; DONE SETTING PULSES
42 CLOCK 31
43 03336 020260 LDA 0, C31
44 03337 006117 JSR @ICONT
45 TCYCLE PRIMLINE
46 ADROUT
47 03340 030071 LDA 2, BDADR ; ADDRESS CORRECT
48 03341 071034 DOA 2, MUX ; BOARD
49 03342 024104 LDA 1, PRIMLINE ; CYCLE TIME STATE
50 03343 125405 INC 1, 1, SNR ; COUNTER TO BEGINNING
51 03344 000404 JMP . +4 ; OF PRIMLINE
52 CLOCK 32
53 03345 020257 LDA 0, C32
54 03346 006117 JSR @ICONT
55 03347 000774 JMP . -4
56 03350 060400 DIA 0, 0 ; TRANSMIT DONE BIT SHOULD
57 03351 101232 MOVZR# 0, 0, SZC ; NOT BE INPUTTED
58 03352 006230 EHALT ; MUX DINA INPUT TO TRANSMIT
59 03353 006231 LOOPX ; DONE O. C. GATE
60
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0048 PTID
01 03354 006226 C009: JSR@ IENT?
02 03355 000003 I
03 03356 062677 IORST
04 03357 006120 JSR@ IDELA
05 03360 020105 LDA @,OUADR
06 03361 101400 INC @,@
07 03362 061034 DOR @,MUX
08 03363 102400 SUB @,@ ;MAKE SURE TRANSMITTER DOES
09 03364 063034 DOC @,MUX ;NOT SET DONE WITHOUT "ON" BIT
10 TIM6 PRIMLINE
11 ADROUT ;PAST TIM2 LATCHING AND TIM6
12 03365 030071 LDA 2,BOADR ;ADDRESS CORRECT
13 03366 071034 DOR 2,MUX ;BOARD
14 ;DONE SETTING PULSES
15 CLOCK 31
16 03367 020260 LDA @,C31
17 03370 006117 JSR @ICONT
18 TCYCLE PRIMLINE
19 ADROUT
20 03371 030071 LDA 2,BOADR ;ADDRESS CORRECT
21 03372 071034 DOR 2,MUX ;BOARD
22 03373 024104 LDA 1,PRIMLINE ;CYCLE TIME STATE
23 03374 125405 INC 1,1,SNR ;COUNTER TO BEGINNING
24 03375 000404 JMP .+4 ;OF PRIMLINE
25 CLOCK 32
26 03376 020257 LDA @,C32
27 03377 006117 JSR @ICONT
28 03400 000774 JMP .-4
29 03401 063734 SKPDZ MUX
30 03402 006230 EHHLT ;CHECK UAR/T, DONE SETTING
31 03403 006231 LOOPX ;LOGIC
32 03404 006226 C010: JSR@ IENT?
33 03405 000003 I
34 03406 062677 IORST
35 03407 006120 JSR@ IDELA
36 03410 020105 LDA @,OUADR ;MAKE SURE TRANSMITTER
37 03411 061034 DOR @,MUX ;DOES NOT SET DONE WHEN
38 03412 102520 SUBZL @,@ ;RECEIVER IS PROGRAMMED
39 03413 063034 DOC @,MUX
40 TIM6 PRIMLINE
41 ADROUT ;PAST TIM2 LATCHING AND TIM6
42 03414 030071 LDA 2,BOADR ;ADDRESS CORRECT
43 03415 071034 DOR 2,MUX ;BOARD
44 ;DONE SETTING PULSES
45 CLOCK 31
46 03416 020260 LDA @,C31
47 03417 006117 JSR @ICONT
48 TCYCLE PRIMLINE
49 ADROUT
50 03420 030071 LDA 2,BOADR ;ADDRESS CORRECT
51 03421 071034 DOR 2,MUX ;BOARD
52 03422 024104 LDA 1,PRIMLINE ;CYCLE TIME STATE
53 03423 125405 INC 1,1,SNR ;COUNTER TO BEGINNING
54 03424 000404 JMP .+4 ;OF PRIMLINE
55 CLOCK 32
56 03425 020257 LDA @,C32
57 03426 006117 JSR @ICONT
58 03427 000774 JMP .-4
59 03430 063734 SKPDZ MUX
60 03431 006230 EHHLT ;CHECK UAR/T, DONE SETTING

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0049 PTID
01 03432 006231 LOOPX ;LOGIC, RCY RDY ALWAYS ON
02
03 03433 006226 C011: JSR@ IENT?
04 03434 000003 I
05 03435 062677 IORST
06 03436 006120 JSR@ IDELA
07 03437 020105 LDA 0, QUADR ;TURN TRANSMITTER ON
08 03440 101400 INC 0, 0
09 03441 061034 DOR 0, MUX
10 03442 102520 SUBZL 0, 0
11 03443 063034 DOC 0, MUX
12 TCYCLE PRIMLINE
13 ADROUT
14 03444 030071 LDA 2, BDADR ;ADDRESS CORRECT
15 03445 071034 DOR 2, MUX ;BOARD
16 03446 024104 LDA 1, PRIMLINE ;CYCLE TIME STATE
17 03447 125405 INC 1, 1, SNR ;COUNTER TO BEGINNING
18 03450 000404 JMP .+4 ;OF PRIMLINE
19 CLOCK 32
20 03451 020257 LDA 0, C32
21 03452 006117 JSR @ICONT
22 03453 000774 JMP .-4
23 TIM2B
24 CLOCK 22
25 03454 020253 LDA 0, C22
26 03455 006117 JSR @ICONT
27 ;MAKE SURE DONE DOES NOT GET
28 03456 063734 SKPDZ MUX ;SET ON UNDERRUN AT TIM2
29 03457 006230 EHALT ;TIME STATE LOGIC, TIMING
30 03460 006231 LOOPX ;GATES TO DECODER
31 03461 006226 C012: JSR@ IENT?
32 03462 000003 I
33 03463 062677 IORST
34 03464 006120 JSR@ IDELA
35 TCYCLE PRIMLINE
36 ADROUT
37 03465 030071 LDA 2, BDADR ;ADDRESS CORRECT
38 03466 071034 DOR 2, MUX ;BOARD
39 03467 024104 LDA 1, PRIMLINE ;CYCLE TIME STATE
40 03470 125405 INC 1, 1, SNR ;COUNTER TO BEGINNING
41 03471 000404 JMP .+4 ;OF PRIMLINE
42 CLOCK 32
43 03472 020257 LDA 0, C32
44 03473 006117 JSR @ICONT
45 03474 000774 JMP .-4
46 TIM2A
47 CLOCK 14
48 03475 020252 LDA 0, C14
49 03476 006117 JSR @ICONT
50 03477 063734 SKPDZ MUX
51 03500 006230 EHALT ;"T0" INPUT TO TIMING GATES
52 03501 006231 LOOPX ;INTO DECODER
53
54 03502 006226 C013: JSR@ IENT?
55 03503 000003 I
56 03504 062677 IORST
57 03505 006120 JSR@ IDELA
58 RECEIVER
59 03506 020105 LDA 0, QUADR
60 03507 061034 DOR 0, MUX ;ENABLE RECEIVER

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0050 PTID
01 03510 126520 SUBZL 1,1
02 03511 067034 DOC 1,MUX ;START RECEIVER
03 03512 123000 ADD 1,0 ;CLEAR TRANSMITTER
04 03513 061034 DOR 0,MUX
05 03514 102400 SUB 0,0
06 03515 063034 DOC 0,MUX
07 ;RECEIVER START SHOULD
08 TIM6 PRIMLINE ;NOT SET DONE
09 ADROUT ;PAST TIM2 LATCHING AND TIM6
10 03516 030071 LDA 2,BOADR ;ADDRESS CORRECT
11 03517 071034 DOR 2,MUX ;BOARD
12 ;DONE SETTING PULSES
13 CLOCK 31
14 03520 020260 LDA 0,C31
15 03521 006117 JSR @ICONT
16 TCYCLE PRIMLINE
17 ADROUT
18 03522 030071 LDA 2,BOADR ;ADDRESS CORRECT
19 03523 071034 DOR 2,MUX ;BOARD
20 03524 024104 LDA 1,PRIMLINE ;CYCLE TIME STATE
21 03525 125405 INC 1,1,SNR ;COUNTER TO BEGINNING
22 03526 000404 JMP .+4 ;OF PRIMLINE
23 CLOCK 32
24 03527 020257 LDA 0,C32
25 03530 006117 JSR @ICONT
26 03531 000774 JMP .-4
27 03532 063734 SKPDZ MUX
28 03533 006230 EHALT ;CHECK DONE SETTING LOGIC
29 03534 006231 LOOPX
30 03535 006226 C016: JSR@ IENT?
31 03536 000003 I
32 03537 062677 IORST
33 03540 006120 JSR@ IDELA
34 RECEIVER
35 03541 020105 LDA 0,OUADR
36 03542 061034 DOR 0,MUX ;ENABLE RECEIVER
37 03543 126520 SUBZL 1,1
38 03544 067034 DOC 1,MUX ;START RECEIVER
39 TRANSMIT LOOPBACK,NOPARITY,CODE8,ONESTOP,CL0
40 03545 101400 INC 0,0 ;ENABLE TRANSMITTER
41 03546 061034 DOR 0,MUX
42 03547 102400 SUB 0,0 ;TURN OFF TRANSMITTER
43 03550 063034 DOC 0,MUX
44 LCS LOOPBACK,NOPARITY,CODE8,ONESTOP,CL0
45 03551 006115 JSR @LINCH ;OUTPUT LINE CHARACTERISTICS
46 03552 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
47 03553 006131 JSR@ .CLR
48 03554 102400 SUB 0,0 ;TRANSMIT "ZERO"
49 03555 062034 DOB 0,MUX
50 03556 006123 JSR@ IDELI ;WAIT
51 03557 063634 SKPDN MUX ;DID RECEIVE SET DONE?
52 03560 006230 EHALT ;NO, CHECK UAR/T, DONE SETTING
53 03561 006231 LOOPX ;LOGIC, LOOPBACK CONTROL,
54 ;LOOPBACK TO "CTS"
55
56 03562 006226 C017: JSR@ IENT? ;SET UP TRANSMITTER AND
57 03563 000003 I
58 03564 062677 IORST
59 03565 006120 JSR@ IDELA ;RECEIVER, BUT DO NOT TRANSMIT
60 RECEIVER

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0051 PTID
01 03566 020105 LDA 0, QUADR
02 03567 061034 DOR 0, MUX ; ENABLE RECEIVER
03 03570 126520 SUBZL 1, 1
04 03571 067034 DOC 1, MUX ; START RECEIVER
05 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
06 03572 101400 INC 0, 0 ; ENABLE TRANSMITTER
07 03573 061034 DOR 0, MUX
08 03574 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
09 03575 063034 DOC 0, MUX
10 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
11 03576 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
12 03577 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
13 03600 006131 JSR@ . CLR
14 03601 102520 SUBZL 0, 0
15 03602 063034 DOC 0, MUX ; START TRANSMITTER
16 03603 006122 JSR@ IDEL
17 03604 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
18 03605 063234 DOCC 0, MUX
19 03606 006123 JSR@ IDELI ; CLEAR DONE, BUT DO NOT TRANS-
20 03607 063734 SKPDZ MUX ; MIT- DID DONE GET SET AGAIN?
21 03610 006230 EHALLT ; YES, CHECK UAR/T, DONE SETTING
22 03611 006231 LOOPX ; LOGIC-TRANSMITTER DID
23 ; NOT TURN OFF
24
25 03612 006226 C018: JSR@ IENT? ; CHECK RECEIVER BIT
26 03613 000003 I
27 03614 062677 IORST
28 03615 006120 JSR@ IDELA ; CORRECT ON DIA
29 RECEIVER
30 03616 020105 LDA 0, QUADR
31 03617 061034 DOR 0, MUX ; ENABLE RECEIVER
32 03620 126520 SUBZL 1, 1
33 03621 067034 DOC 1, MUX ; START RECEIVER
34 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
35 03622 101400 INC 0, 0 ; ENABLE TRANSMITTER
36 03623 061034 DOR 0, MUX
37 03624 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
38 03625 063034 DOC 0, MUX
39 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
40 03626 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
41 03627 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
42 03630 006131 JSR@ . CLR
43 03631 102400 SUB 0, 0
44 03632 062034 DOB 0, MUX ; TRANSMIT "ZERO" DATA
45 03633 063634 SKPDN MUX
46 03634 000777 JMP . -1
47 03635 060434 DIA 0, MUX ; INPUT SCAN ADDRESS
48 03636 101232 MOVZR# 0, 0, SZC
49 03637 006230 EHALLT ; CHECK RECEIVE/TRANSMIT
50 03640 006231 LOOPX ; FLOP TO DIA. UAR/T
51 C019: DATAOUT 377
52 03641 006226 JSR@ IENT?
53 03642 000003 I
54 03643 062677 IORST
55 03644 006120 JSR@ IDELA
56 RECEIVER
57 03645 020105 LDA 0, QUADR
58 03646 061034 DOR 0, MUX ; ENABLE RECEIVER
59 03647 126520 SUBZL 1, 1
60 03650 067034 DOC 1, MUX ; START RECEIVER

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0052 PTID

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01          TRANSMIT      LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
02 03651 101400  INC      0, 0          ; ENABLE TRANSMITTER
03 03652 061034  DOR      0, MUX
04 03653 102400  SUB      0, 0          ; TURN OFF TRANSMITTER
05 03654 063034  DOC      0, MUX
06          LCS          LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
07 03655 006115  JSR      @ LINCH       ; OUTPUT LINE CHARACTERISTICS
08 03656 100031  100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
09 03657 006131  JSR@     . CLR         ; ONLINE & DELAY FOR BAUD RATE
10 03660 024323  LDA      1, C377      ; OUTPUT WORD
11 03661 066034  DOB      1, MUX
12 03662 063634  SKPDN   MUX          ; WAIT FOR RECEIVE WORD
13 03663 000777  JMP      . -1
14 03664 061434  DIB      0, MUX       ; INPUT RECEIVE DATA
15 03665 122414  SUB#     1, 0, SZR     ; DOES DATA MATCH?
16 03666 006230  EHALLT
17          LOOP        ; CONTROL LOGIC, O. C. GATES
18 03667 006227  JSR      @ICYC?E     ; END OF SUBTEST
19
20
21 03670 006226 C020: JSR@     IENT?         ; MAKE SURE DATA DOES NOT
22 03671 000003  I
23 03672 062677  IORST
24 03673 006120  JSR@     IDELA        ; ENTER BUS ON DIB 0
25          RECEIVER
26 03674 020105  LDA      0, QUADR
27 03675 061034  DOR      0, MUX       ; ENABLE RECEIVER
28 03676 126520  SUBZL   1, 1
29 03677 067034  DOC      1, MUX       ; START RECEIVER
30          TRANSMIT      LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
31 03700 101400  INC      0, 0          ; ENABLE TRANSMITTER
32 03701 061034  DOR      0, MUX
33 03702 102400  SUB      0, 0          ; TURN OFF TRANSMITTER
34 03703 063034  DOC      0, MUX
35          LCS          LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
36 03704 006115  JSR      @ LINCH       ; OUTPUT LINE CHARACTERISTICS
37 03705 100031  100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
38 03706 006131  JSR@     . CLR
39 03707 024323  LDA      1, C377      ; TRANSMIT DATA
40 03710 066034  DOB      1, MUX
41 03711 063634  SKPDN   MUX
42 03712 000777  JMP      . -1
43 03713 061400  DIB      0, 0         ; TRY TO INPUT ON DIB 0
44 03714 101004  MOV      0, 0, SZR
45 03715 006230  EHALLT
46 03716 006231  LOOPX
47
48 03717 006226 C021: JSR@     IENT?         ; MAKE SURE DATA DOES NOT
49 03720 000003  I
50 03721 062677  IORST
51 03722 006120  JSR@     IDELA        ; ENTER ON DIA
52          RECEIVER
53 03723 020105  LDA      0, QUADR
54 03724 061034  DOR      0, MUX       ; ENABLE RECEIVER
55 03725 126520  SUBZL   1, 1
56 03726 067034  DOC      1, MUX       ; START RECEIVER
57          TRANSMIT      LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
58 03727 101400  INC      0, 0          ; ENABLE TRANSMITTER
59 03730 061034  DOR      0, MUX
60 03731 102400  SUB      0, 0          ; TURN OFF TRANSMITTER

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0053 PTID
01 03732 063034 DOC 0, MUX
02 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
03 03733 006115 JSR @. LINC ; OUTPUT LINE CHARACTERISTICS
04 03734 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
05 03735 006131 JSR@ . CLR
06 03736 024323 LDA 1, C377 ; TRANSMIT DATA
07 03737 066034 DOB 1, MUX
08 03740 063634 SKPDN MUX
09 03741 000777 JMP . -1
10 03742 060434 DIA 0, MUX ; TRY TO INPUT DATA WITH DIA
11 03743 123400 AND 1, 0 ; MASK OUT NORMAL DIA INFO
12 03744 122415 SUB# 1, 0, SNR
13 03745 006230 EHALL ; DIB INPUT TO DIB LOGIC
14 03746 006231 LOOPX ; OPEN
15 03747 006226 C022: JSR@ IENT? ; MAKE SURE LC'S ARE NOT
16 03750 000003 I
17 03751 062677 IORST
18 03752 006120 JSR@ IDELA ; OUTPUTTED WITHOUT BIT 0 ON DOC
19 RECEIVER ; TURN ON RECEIVER
20 03753 020105 LDA 0, QUADR
21 03754 061034 DOA 0, MUX ; ENABLE RECEIVER
22 03755 126520 SUBZL 1, 1
23 03756 067034 DOC 1, MUX ; START RECEIVER
24 03757 020064 LDA 0, LON
25 03760 063034 DOC 0, MUX ; TURN ON LOOPBACK
26 03761 020300 LDA 0, C31 ; OUTPUT LINE CHARACTERISTICS
27 03762 063034 DOC 0, MUX ; WITHOUT BIT 0
28 03763 006131 JSR@ . CLR
29 03764 024323 LDA 1, C377 ; OUTPUT DATA
30 03765 066034 DOB 1, MUX
31 03766 006123 JSR@ IDELI
32 03767 061434 DIB 0, MUX ; INPUT RECEIVED DATA
33 03770 024304 LDA 1, C37
34 03771 122414 SUB# 1, 0, SZR ; IS DATA 5 LEVEL CODE?
35 03772 006230 EHALL ; NO, CHECK DATA-0 TO (-LCDOC),
36 03773 006231 LOOPX ; CHECK (-LCDOC) LOGIC
37
38 03774 006226 C023: JSR@ IENT? ; MAKE SURE LC'S ARE NOT
39 03775 000003 I
40 03776 062677 IORST
41 03777 006120 JSR@ IDELA ; OUTPUTTED ON A DOB
42 RECEIVER
43 04000 020105 LDA 0, QUADR
44 04001 061034 DOA 0, MUX ; ENABLE RECEIVER
45 04002 126520 SUBZL 1, 1
46 04003 067034 DOC 1, MUX ; START RECEIVER
47 04004 020064 LDA 0, LON
48 04005 063034 DOC 0, MUX ; TURN ON LOOPBACK
49 04006 020413 LDA 0, K1031 ; OUTPUT LINE CHARACTERISTICS
50 04007 062034 DOB 0, MUX ; WITH A DOB INSTEAD OF DOC
51 04010 006131 JSR@ . CLR
52 04011 024323 LDA 1, C377 ; OUTPUT DATA
53 04012 066034 DOB 1, MUX
54 04013 006123 JSR@ IDELI
55 04014 061434 DIB 0, MUX ; INPUT DATA
56 04015 122415 SUB# 1, 0, SNR
57 04016 006230 EHALL ; DOC INPUT TO (-LCDOC)
58 04017 006231 LOOPX ; OPEN
59 04020 000402 JMP . +2
60 04021 100031 K1031: 100031

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0054 PTID

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01 04022 006226 C024: JSR@ IENT? ;MAKE SURE DATA IS NOT TRANS-
02 04023 000003 I
03 04024 062677 IORST
04 04025 006120 JSR@ IDELA
05 04026 062677 IORST
06 04027 006120 JSR@ IDELA ;MITTED ON A DOB 0
07 RECEIVER
08 04030 020105 LDA 0, QUADR
09 04031 061034 DOA 0, MUX ;ENABLE RECEIVER
10 04032 126520 SUBZL 1, 1
11 04033 067034 DOC 1, MUX ;START RECEIVER
12 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
13 04034 101400 INC 0, 0 ;ENABLE TRANSMITTER
14 04035 061034 DOA 0, MUX
15 04036 102400 SUB 0, 0 ;TURN OFF TRANSMITTER
16 04037 063034 DOC 0, MUX
17 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
18 04040 006115 JSR @. LINCH ;OUTPUT LINE CHARACTERISTICS
19 04041 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
20 04042 006131 JSR@ . CLR
21 04043 024323 LDA 1, C377 ;OUTPUT DATA WITH A DOB 0
22 04044 066000 DOB 1, 0
23 04045 006123 JSR@ IDELI
24 04046 063734 SKPDZ MUX ;DONE SHOULD NOT SET
25 04047 006230 EHALT ;PTI INPUT TO DOB OPEN,
26 04050 006231 LOOPX ;CHECK DOB LOGIC
27
28 04051 006226 C025: JSR@ IENT? ;MAKE SURE NO DATA IS TRANS-
29 04052 000003 I
30 04053 062677 IORST
31 04054 006120 JSR@ IDELA ;MITTED ON A DOC
32 RECEIVER
33 04055 020105 LDA 0, QUADR
34 04056 061034 DOA 0, MUX ;ENABLE RECEIVER
35 04057 126520 SUBZL 1, 1
36 04060 067034 DOC 1, MUX ;START RECEIVER
37 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
38 04061 101400 INC 0, 0 ;ENABLE TRANSMITTER
39 04062 061034 DOA 0, MUX
40 04063 102400 SUB 0, 0 ;TURN OFF TRANSMITTER
41 04064 063034 DOC 0, MUX
42 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
43 04065 006115 JSR @. LINCH ;OUTPUT LINE CHARACTERISTICS
44 04066 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
45 04067 006131 JSR@ . CLR
46 04070 024322 LDA 1, C376 ;OUTPUT TRANSMIT DATA
47 04071 067034 DOC 1, MUX ;WITH DOC(ILLEGAL)
48 04072 006123 JSR@ IDELI
49 04073 063734 SKPDZ MUX ;DONE SHOULD NOT SET
50 04074 006230 EHALT ;DOB INPUT TO DOB LOGIC
51 04075 006231 LOOPX ;OPEN
52
53 04076 006226 C026: JSR@ IENT? ;BIT 0 MUST BE OFF FOR
54 04077 000003 I
55 04100 062677 IORST
56 04101 006120 JSR@ IDELA ;TRANSMIT DATA
57 RECEIVER
58 04102 020105 LDA 0, QUADR
59 04103 061034 DOA 0, MUX ;ENABLE RECEIVER
60 04104 126520 SUBZL 1, 1

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0055 PTID
01 04105 067034 DOC 1, MUX ; START RECEIVER
02 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
03 04106 101400 INC 0, 0 ; ENABLE TRANSMITTER
04 04107 061034 D0A 0, MUX
05 04110 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
06 04111 063034 DOC 0, MUX
07 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
08 04112 006115 JSR @LINCH ; OUTPUT LINE CHARACTERISTICS
09 04113 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
10 04114 006131 JSR@ . CLR
11 04115 024407 LDA 1, KB26 ; OUTPUT TRANSMIT DATA WITH
12 04116 066034 DOB 1, MUX ; BIT 0 ON (MODEM MODE)
13 04117 006123 JSR@ IDELI
14 04120 063734 SKPDZ MUX ; DONE SHOULD NOT SET
15 04121 006230 EHALT ; (-DATA0) INPUT TO DOB
16 04122 006231 LOOPX ; LOGIC OPEN
17 04123 000402 JMP . +2
18 04124 100374 KB26: 100374
19 ; CHECK XMIT/RCV DATA BITS ONE AT A TIME
20
21 C027: DATAOUT 0
22 04125 006226 JSR@ IENT?
23 04126 000003 I
24 04127 062677 IORST
25 04130 006120 JSR@ IDELA
26 RECEIVER
27 04131 020105 LDA 0, QUADR
28 04132 061034 D0A 0, MUX ; ENABLE RECEIVER
29 04133 126520 SUBZL 1, 1
30 04134 067034 DOC 1, MUX ; START RECEIVER
31 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
32 04135 101400 INC 0, 0 ; ENABLE TRANSMITTER
33 04136 061034 D0A 0, MUX
34 04137 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
35 04140 063034 DOC 0, MUX
36 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
37 04141 006115 JSR @LINCH ; OUTPUT LINE CHARACTERISTICS
38 04142 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
39 04143 006131 JSR@ . CLR ; ONLINE & DELAY FOR BAUD RATE
40 04144 024242 LDA 1, C0 ; OUTPUT WORD
41 04145 066034 DOB 1, MUX
42 04146 063634 SKPDN MUX ; WAIT FOR RECEIVE WORD
43 04147 000777 JMP . -1
44 04150 061434 DIB 0, MUX ; INPUT RECEIVE DATA
45 04151 122414 SUB# 1, 0, SZR ; DOES DATA MATCH?
46 04152 006230 EHALT ; NO, CHECK UAR/T, DIB, DIC
47 LOOP ; CONTROL LOGIC, O. C. GATES
48 04153 006227 JSR @ICYC?E ; END OF SUBTEST
49
50 C028: DATAOUT 1
51 04154 006226 JSR@ IENT?
52 04155 000003 I
53 04156 062677 IORST
54 04157 006120 JSR@ IDELA
55 RECEIVER
56 04160 020105 LDA 0, QUADR
57 04161 061034 D0A 0, MUX ; ENABLE RECEIVER
58 04162 126520 SUBZL 1, 1
59 04163 067034 DOC 1, MUX ; START RECEIVER
60 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0

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0056 PTID

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01 04164 101400      INC      0,0           ;ENABLE TRANSMITTER
02 04165 061034      DOR      0,MUX
03 04166 102400      SUB      0,0           ;TURN OFF TRANSMITTER
04 04167 063034      DOC      0,MUX
05                    LCS      LOOPBACK,NOPARITY, CODE8, ONESTOP, CL0
06 04170 006115      JSR      @LINCH       ;OUTPUT LINE CHARACTERISTICS
07 04171 100031      100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
08 04172 006131      JSR@     .CLR         ;ONLINE & DELAY FOR BAUD RATE
09 04173 024243      LDA      1,C1        ;OUTPUT WORD
10 04174 066034      DOB      1,MUX
11 04175 063634      SKPDN    MUX         ;WAIT FOR RECEIVE WORD
12 04176 000777      JMP      .-1
13 04177 061434      DIB      0,MUX       ;INPUT RECEIVE DATA
14 04200 122414      SUB#     1,0,SZR     ;DOES DATA MATCH?
15 04201 006230      EHALT
16                    ;NO, CHECK UAR/T,DIB,DIC
16                    LOOP
17 04202 006227      JSR      @ICYC?E     ;CONTROL LOGIC, O. C. GATES
17                    ;END OF SUBTEST
18
19                    C029: DATAOUT      2
20 04203 006226      JSR@     IENT?
21 04204 000003      I
22 04205 062677      IORST
23 04206 006120      JSR@     IDELA
24                    RECEIVER
25 04207 020105      LDA      0,OUADR
26 04210 061034      DOR      0,MUX       ;ENABLE RECEIVER
27 04211 126520      SUBZL    1,1
28 04212 067034      DOC      1,MUX       ;START RECEIVER
29                    TRANSMIT      LOOPBACK,NOPARITY, CODE8, ONESTOP, CL0
30 04213 101400      INC      0,0           ;ENABLE TRANSMITTER
31 04214 061034      DOR      0,MUX
32 04215 102400      SUB      0,0           ;TURN OFF TRANSMITTER
33 04216 063034      DOC      0,MUX
34                    LCS      LOOPBACK,NOPARITY, CODE8, ONESTOP, CL0
35 04217 006115      JSR      @LINCH       ;OUTPUT LINE CHARACTERISTICS
36 04220 100031      100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
37 04221 006131      JSR@     .CLR         ;ONLINE & DELAY FOR BAUD RATE
38 04222 024244      LDA      1,C2        ;OUTPUT WORD
39 04223 066034      DOB      1,MUX
40 04224 063634      SKPDN    MUX         ;WAIT FOR RECEIVE WORD
41 04225 000777      JMP      .-1
42 04226 061434      DIB      0,MUX       ;INPUT RECEIVE DATA
43 04227 122414      SUB#     1,0,SZR     ;DOES DATA MATCH?
44 04230 006230      EHALT
45                    ;NO, CHECK UAR/T,DIB,DIC
45                    LOOP
46 04231 006227      JSR      @ICYC?E     ;CONTROL LOGIC, O. C. GATES
46                    ;END OF SUBTEST
47
48                    C030: DATAOUT      4
49 04232 006226      JSR@     IENT?
50 04233 000003      I
51 04234 062677      IORST
52 04235 006120      JSR@     IDELA
53                    RECEIVER
54 04236 020105      LDA      0,OUADR
55 04237 061034      DOR      0,MUX       ;ENABLE RECEIVER
56 04240 126520      SUBZL    1,1
57 04241 067034      DOC      1,MUX       ;START RECEIVER
58                    TRANSMIT      LOOPBACK,NOPARITY, CODE8, ONESTOP, CL0
59 04242 101400      INC      0,0           ;ENABLE TRANSMITTER
60 04243 061034      DOR      0,MUX

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0057 PTID
01 04244 102400 SUB 0,0 ;TURN OFF TRANSMITTER
02 04245 063034 DOC 0,MUX
03 LCS LOOPBACK,NOPARITY, CODE8, ONESTOP, CL0
04 04246 006115 JSR @.LINCH ;OUTPUT LINE CHARACTERISTICS
05 04247 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
06 04250 006131 JSR@ .CLR ;ONLINE & DELAY FOR BAUD RATE
07 04251 024246 LDA 1,C4 ;OUTPUT WORD
08 04252 066034 DOB 1,MUX
09 04253 063634 SKPDN MUX ;WAIT FOR RECEIVE WORD
10 04254 000777 JMP .-1
11 04255 061434 DIB 0,MUX ;INPUT RECEIVE DATA
12 04256 122414 SUB# 1,0,SZR ;DOES DATA MATCH?
13 04257 006230 EHHLT ;NO, CHECK UAR/T,DIB,DIC
14 LOOP ;CONTROL LOGIC, O. C. GATES
15 04260 006227 JSR @ICYC?E ;END OF SUBTEST
16
17 C031: DATAOUT 10
18 04261 006226 JSR@ IENT?
19 04262 000003 I
20 04263 062677 IORST
21 04264 006120 JSR@ IDELA
22 RECEIVER
23 04265 020105 LDA 0,OUADR
24 04266 061034 DOA 0,MUX ;ENABLE RECEIVER
25 04267 126520 SUBZL 1,1
26 04270 067034 DOC 1,MUX ;START RECEIVER
27 TRANSMIT LOOPBACK,NOPARITY, CODE8, ONESTOP, CL0
28 04271 101400 INC 0,0 ;ENABLE TRANSMITTER
29 04272 061034 DOA 0,MUX
30 04273 102400 SUB 0,0 ;TURN OFF TRANSMITTER
31 04274 063034 DOC 0,MUX
32 LCS LOOPBACK,NOPARITY, CODE8, ONESTOP, CL0
33 04275 006115 JSR @.LINCH ;OUTPUT LINE CHARACTERISTICS
34 04276 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
35 04277 006131 JSR@ .CLR ;ONLINE & DELAY FOR BAUD RATE
36 04300 024263 LDA 1,C10 ;OUTPUT WORD
37 04301 066034 DOB 1,MUX
38 04302 063634 SKPDN MUX ;WAIT FOR RECEIVE WORD
39 04303 000777 JMP .-1
40 04304 061434 DIB 0,MUX ;INPUT RECEIVE DATA
41 04305 122414 SUB# 1,0,SZR ;DOES DATA MATCH?
42 04306 006230 EHHLT ;NO, CHECK UAR/T,DIB,DIC
43 LOOP ;CONTROL LOGIC, O. C. GATES
44 04307 006227 JSR @ICYC?E ;END OF SUBTEST
45
46 C032: DATAOUT 20
47 04310 006226 JSR@ IENT?
48 04311 000003 I
49 04312 062677 IORST
50 04313 006120 JSR@ IDELA
51 RECEIVER
52 04314 020105 LDA 0,OUADR
53 04315 061034 DOA 0,MUX ;ENABLE RECEIVER
54 04316 126520 SUBZL 1,1
55 04317 067034 DOC 1,MUX ;START RECEIVER
56 TRANSMIT LOOPBACK,NOPARITY, CODE8, ONESTOP, CL0
57 04320 101400 INC 0,0 ;ENABLE TRANSMITTER
58 04321 061034 DOA 0,MUX
59 04322 102400 SUB 0,0 ;TURN OFF TRANSMITTER
60 04323 063034 DOC 0,MUX

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0058 PTID
01      LCS      LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
02 04324 006115 JSR      @. LINCH      ; OUTPUT LINE CHARACTERISTICS
03 04325 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
04 04326 006131 JSR@     . CLR          ; ONLINE & DELAY FOR BAUD RATE
05 04327 024271 LDA      1, C20        ; OUTPUT WORD
06 04330 066034 DOB      1, MUX
07 04331 063634 SKPDN   MUX           ; WAIT FOR RECEIVE WORD
08 04332 000777 JMP      . -1
09 04333 061434 DIB      0, MUX       ; INPUT RECEIVE DATA
10 04334 122414 SUB#     1, 0, SZR     ; DOES DATA MATCH?
11 04335 006230 EHHLT                    ; NO, CHECK UAR/T, DIB, DIC
12      LOOP                    ; CONTROL LOGIC, O. C. GATES
13 04336 006227 JSR      @ICYC?E      ; END OF SUBTEST
14
15      C033:  DATAOUT      40
16 04337 006226 JSR@     IENT?
17 04340 000003 I
18 04341 062677 IORST
19 04342 006120 JSR@     IDELA
20      RECEIVER
21 04343 020105 LDA      0, OADR
22 04344 061034 DOA      0, MUX       ; ENABLE RECEIVER
23 04345 126520 SUBZL   1, 1
24 04346 067034 DOC      1, MUX       ; START RECEIVER
25      TRANSMIT      LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
26 04347 101400 INC      0, 0         ; ENABLE TRANSMITTER
27 04350 061034 DOA      0, MUX
28 04351 102400 SUB      0, 0         ; TURN OFF TRANSMITTER
29 04352 063034 DOC      0, MUX
30      LCS      LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
31 04353 006115 JSR      @. LINCH      ; OUTPUT LINE CHARACTERISTICS
32 04354 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
33 04355 006131 JSR@     . CLR          ; ONLINE & DELAY FOR BAUD RATE
34 04356 024305 LDA      1, C40        ; OUTPUT WORD
35 04357 066034 DOB      1, MUX
36 04360 063634 SKPDN   MUX           ; WAIT FOR RECEIVE WORD
37 04361 000777 JMP      . -1
38 04362 061434 DIB      0, MUX       ; INPUT RECEIVE DATA
39 04363 122414 SUB#     1, 0, SZR     ; DOES DATA MATCH?
40 04364 006230 EHHLT                    ; NO, CHECK UAR/T, DIB, DIC
41      LOOP                    ; CONTROL LOGIC, O. C. GATES
42 04365 006227 JSR      @ICYC?E      ; END OF SUBTEST
43
44      C034:  DATAOUT      100
45 04366 006226 JSR@     IENT?
46 04367 000003 I
47 04370 062677 IORST
48 04371 006120 JSR@     IDELA
49      RECEIVER
50 04372 020105 LDA      0, OADR
51 04373 061034 DOA      0, MUX       ; ENABLE RECEIVER
52 04374 126520 SUBZL   1, 1
53 04375 067034 DOC      1, MUX       ; START RECEIVER
54      TRANSMIT      LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
55 04376 101400 INC      0, 0         ; ENABLE TRANSMITTER
56 04377 061034 DOA      0, MUX
57 04400 102400 SUB      0, 0         ; TURN OFF TRANSMITTER
58 04401 063034 DOC      0, MUX
59      LCS      LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
60 04402 006115 JSR      @. LINCH      ; OUTPUT LINE CHARACTERISTICS

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0059 PTID
01 04403 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
02 04404 006131 JSR@ . CLR ; ONLINE & DELAY FOR BAUD RATE
03 04405 024311 LDA 1, C100 ; OUTPUT WORD
04 04406 066034 DOB 1, MUX
05 04407 063634 SKPDN MUX ; WAIT FOR RECEIVE WORD
06 04410 000777 JMP . -1
07 04411 061434 DIB 0, MUX ; INPUT RECEIVE DATA
08 04412 122414 SUB# 1, 0, SZR ; DOES DATA MATCH?
09 04413 006230 EHHLT ; NO, CHECK UAR/T, DIB, DIC
10 LOOP ; CONTROL LOGIC, O. C. GATES
11 04414 006227 JSR @ICVC?E ; END OF SUBTEST
12
13 C035: DATAOUT 200
14 04415 006226 JSR@ IENT?
15 04416 000003 I
16 04417 062677 IORST
17 04420 006120 JSR@ IDELA
18 RECEIVER
19 04421 020105 LDA 0, OUADR
20 04422 061034 DOA 0, MUX ; ENABLE RECEIVER
21 04423 126520 SUBZL 1, 1
22 04424 067034 DOC 1, MUX ; START RECEIVER
23 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
24 04425 101400 INC 0, 0 ; ENABLE TRANSMITTER
25 04426 061034 DOA 0, MUX
26 04427 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
27 04430 063034 DOC 0, MUX
28 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
29 04431 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
30 04432 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
31 04433 006131 JSR@ . CLR ; ONLINE & DELAY FOR BAUD RATE
32 04434 024314 LDA 1, C200 ; OUTPUT WORD
33 04435 066034 DOB 1, MUX
34 04436 063634 SKPDN MUX ; WAIT FOR RECEIVE WORD
35 04437 000777 JMP . -1
36 04440 061434 DIB 0, MUX ; INPUT RECEIVE DATA
37 04441 122414 SUB# 1, 0, SZR ; DOES DATA MATCH?
38 04442 006230 EHHLT ; NO, CHECK UAR/T, DIB, DIC
39 LOOP ; CONTROL LOGIC, O. C. GATES
40 04443 006227 JSR @ICVC?E ; END OF SUBTEST
41
42
43 04444 006226 C037: JSR@ IENT?
44 04445 000003 I
45 04446 062677 IORST
46 04447 006120 JSR@ IDELA
47 RECEIVER
48 04450 020105 LDA 0, OUADR
49 04451 061034 DOA 0, MUX ; ENABLE RECEIVER
50 04452 126520 SUBZL 1, 1
51 04453 067034 DOC 1, MUX ; START RECEIVER
52 TRANSMIT NOLOOP, NOPARITY, CODE8, ONESTOP, CL0
53 04454 101400 INC 0, 0 ; ENABLE TRANSMITTER
54 04455 061034 DOA 0, MUX
55 04456 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
56 04457 063034 DOC 0, MUX
57 LCS NOLOOP, NOPARITY, CODE8, ONESTOP, CL0
58 04460 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
59 04461 100030 100000+NOLOOP+NOPARITY+CODE8+ONESTOP+CL0
60 04462 006131 JSR@ . CLR

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0060 PTID

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01 04463 024323 LDA 1, C377 ; TRANSMIT ALL ONES WITH
02 04464 066034 DOB 1, MUX ; LOOPBACK OFF
03 04465 006123 JSR@ IDELI
04 04466 061434 DIB 0, MUX
05 04467 122415 SUB# 1, 0, SNR ; NO DATA RETURNED (OK)
06 04470 006230 EHALLT ; CHECK LOOPBACK GATES, UAR/T
07 04471 006231 LOOPX
08 04472 006226 C038: JSR@ IENT?
09 04473 000003 I
10 04474 062677 IORST
11 04475 006120 JSR@ IDELA
12 04476 062677 IORST
13 04477 006120 JSR@ IDELA
14 RECEIVER
15 04500 020105 LDA 0, QUADR
16 04501 061034 DOR 0, MUX ; ENABLE RECEIVER
17 04502 126520 SUBZL 1, 1
18 04503 067034 DOC 1, MUX ; START RECEIVER
19 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL1
20 04504 101400 INC 0, 0 ; ENABLE TRANSMITTER
21 04505 061034 DOR 0, MUX
22 04506 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
23 04507 063034 DOC 0, MUX
24 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL1
25 04510 006115 JSR @ LINC ; OUTPUT LINE CHARACTERISTICS
26 04511 100231 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL1
27 DATACHECK 252 ; TRANSMIT WITH CL1
28 04512 006131 JSR@ . CLR
29 04513 024316 LDA 1, C252 ; OUTPUT ONE WORD
30 04514 066034 DOB 1, MUX
31 04515 063634 SKPDN MUX ; WAIT FOR RECEIVER COMPLETE
32 04516 000777 JMP .-1
33 04517 061434 DIB 0, MUX
34 04520 122414 SUB# 1, 0, SZR ; DOES RECEIVE WORD MATCH?
35 04521 006230 EHALLT ; NO, CHECK UAR/T
36 LOOP
37 04522 006227 JSR @ICYC?E ; END OF SUBTEST
38
39
40 04523 006226 C039: JSR@ IENT? ; TRANSMIT WITH CL2
41 04524 000003 I
42 04525 062677 IORST
43 04526 006120 JSR@ IDELA
44 RECEIVER
45 04527 020105 LDA 0, QUADR
46 04530 061034 DOR 0, MUX ; ENABLE RECEIVER
47 04531 126520 SUBZL 1, 1
48 04532 067034 DOC 1, MUX ; START RECEIVER
49 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL2
50 04533 101400 INC 0, 0 ; ENABLE TRANSMITTER
51 04534 061034 DOR 0, MUX
52 04535 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
53 04536 063034 DOC 0, MUX
54 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL2
55 04537 006115 JSR @ LINC ; OUTPUT LINE CHARACTERISTICS
56 04540 100431 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL2
57 DATACHECK 125
58 04541 006131 JSR@ . CLR
59 04542 024312 LDA 1, C125 ; OUTPUT ONE WORD
60 04543 066034 DOB 1, MUX

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0061 PTID
01 04544 063634 SKPDN MUX ;WAIT FOR RECEIVER COMPLETE
02 04545 000777 JMP .-1
03 04546 061434 DIB 0, MUX
04 04547 122414 SUB# 1, 0, SZR ; DOES RECEIVE WORD MATCH?
05 04550 006230 EHALT ; NO, CHECK UAR/T
06 LOOP
07 04551 006227 JSR @ICYC?E ; END OF SUBTEST
08
09
10 04552 006226 C040: JSR@ IENT?
11 04553 000003 I
12 04554 062677 IORST
13 04555 006120 JSR@ IDELA
14 RECEIVER
15 04556 020105 LDA 0, QUADR
16 04557 061034 DOR 0, MUX ; ENABLE RECEIVER
17 04560 126520 SUBZL 1, 1
18 04561 067034 DOC 1, MUX ; START RECEIVER
19 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL3
20 04562 101400 INC 0, 0 ; ENABLE TRANSMITTER
21 04563 061034 DOR 0, MUX
22 04564 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
23 04565 063034 DOC 0, MUX
24 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL3
25 04566 006115 JSR @ LINC ; OUTPUT LINE CHARACTERISTICS
26 04567 100631 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL3
27 DATACHECK 252 ; TRANSMIT USING CLOCK 3
28 04570 006131 JSR@ . CLR
29 04571 024316 LDA 1, C252 ; OUTPUT ONE WORD
30 04572 066034 DOB 1, MUX
31 04573 063634 SKPDN MUX ; WAIT FOR RECEIVER COMPLETE
32 04574 000777 JMP .-1
33 04575 061434 DIB 0, MUX
34 04576 122414 SUB# 1, 0, SZR ; DOES RECEIVE WORD MATCH?
35 04577 006230 EHALT ; NO, CHECK UAR/T
36 LOOP
37 04600 006227 JSR @ICYC?E ; END OF SUBTEST
38
39 04601 006226 C041: JSR@ IENT? ; CHECK 2 STOP BITS TRANSMISSION
40 04602 000003 I
41 04603 062677 IORST
42 04604 006120 JSR@ IDELA
43 RECEIVER
44 04605 020105 LDA 0, QUADR
45 04606 061034 DOR 0, MUX ; ENABLE RECEIVER
46 04607 126520 SUBZL 1, 1
47 04610 067034 DOC 1, MUX ; START RECEIVER
48 TRANSMIT LOOPBACK, NOPARITY, CODE8, TWOSTOP, CL0
49 04611 101400 INC 0, 0 ; ENABLE TRANSMITTER
50 04612 061034 DOR 0, MUX
51 04613 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
52 04614 063034 DOC 0, MUX
53 LCS LOOPBACK, NOPARITY, CODE8, TWOSTOP, CL0
54 04615 006115 JSR @ LINC ; OUTPUT LINE CHARACTERISTICS
55 04616 100071 100000+LOOPBACK+NOPARITY+CODE8+TWOSTOP+CL0
56 DATACHECK 125
57 04617 006131 JSR@ . CLR
58 04620 024312 LDA 1, C125 ; OUTPUT ONE WORD
59 04621 066034 DOB 1, MUX
60 04622 063634 SKPDN MUX ; WAIT FOR RECEIVER COMPLETE

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0062 PTID

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01 04623 000777      JMP      .-1
02 04624 061434      DIB      0, MUX
03 04625 122414      SUB#     1, 0, SZR      ; DOES RECEIVE WORD MATCH?
04 04626 006230      EHFLT                    ; NO, CHECK UAR/T
05                                LOOP
06 04627 006227      JSR      @ICYC?E      ; END OF SUBTEST
07
08
09 04630 006226 C042: JSR@     IENT?          ; CHECK 7 LEVEL CODE
10 04631 000003      I
11 04632 062677      IORST
12 04633 006120      JSR@     IDELA
13                                RECEIVER
14 04634 020105      LDA      0, QUADR
15 04635 061034      DOR      0, MUX      . ; ENABLE RECEIVER
16 04636 126520      SUBZL    1, 1
17 04637 067034      DOC      1, MUX      ; START RECEIVER
18                                TRANSMIT      LOOPBACK, NOPARITY, CODE7, ONESTOP, CL0
19 04640 101400      INC      0, 0      ; ENABLE TRANSMITTER
20 04641 061034      DOR      0, MUX
21 04642 102400      SUB      0, 0      ; TURN OFF TRANSMITTER
22 04643 063034      DOC      0, MUX
23                                LCS      LOOPBACK, NOPARITY, CODE7, ONESTOP, CL0
24 04644 006115      JSR      @ LINCH      ; OUTPUT LINE CHARACTERISTICS
25 04645 100021      100000+LOOPBACK+NOPARITY+CODE7+ONESTOP+CL0
26                                DATACHECK      125
27 04646 006131      JSR@     . CLR
28 04647 024312      LDA      1, C125      ; OUTPUT ONE WORD
29 04650 066034      DOB      1, MUX
30 04651 063634      SKPDN    MUX      ; WAIT FOR RECEIVER COMPLETE
31 04652 000777      JMP      .-1
32 04653 061434      DIB      0, MUX
33 04654 122414      SUB#     1, 0, SZR      ; DOES RECEIVE WORD MATCH?
34 04655 006230      EHFLT                    ; NO, CHECK UAR/T
35                                LOOP
36 04656 006227      JSR      @ICYC?E      ; END OF SUBTEST
37
38
39 04657 006226 C043: JSR@     IENT?          ; CHECK 6 LEVEL CODE
40 04660 000003      I
41 04661 062677      IORST
42 04662 006120      JSR@     IDELA
43                                RECEIVER
44 04663 020105      LDA      0, QUADR
45 04664 061034      DOR      0, MUX      ; ENABLE RECEIVER
46 04665 126520      SUBZL    1, 1
47 04666 067034      DOC      1, MUX      ; START RECEIVER
48                                TRANSMIT      LOOPBACK, NOPARITY, CODE6, ONESTOP, CL0
49 04667 101400      INC      0, 0      ; ENABLE TRANSMITTER
50 04670 061034      DOR      0, MUX
51 04671 102400      SUB      0, 0      ; TURN OFF TRANSMITTER
52 04672 063034      DOC      0, MUX
53                                LCS      LOOPBACK, NOPARITY, CODE6, ONESTOP, CL0
54 04673 006115      JSR      @ LINCH      ; OUTPUT LINE CHARACTERISTICS
55 04674 100011      100000+LOOPBACK+NOPARITY+CODE6+ONESTOP+CL0
56                                DATACHECK      52
57 04675 006131      JSR@     . CLR
58 04676 024306      LDA      1, C52      ; OUTPUT ONE WORD
59 04677 066034      DOB      1, MUX
60 04700 063634      SKPDN    MUX      ; WAIT FOR RECEIVER COMPLETE

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0063 PTID
01 04701 000777      JMP      .-1
02 04702 061434      DIB      0, MUX
03 04703 122414      SUB#     1, 0, SZR      ; DOES RECEIVE WORD MATCH?
04 04704 006230      EHALLT           ; NO, CHECK UAR/T
05                                LOOP
06 04705 006227      JSR      @ICYC?E      ; END OF SUBTEST
07
08 04706 006226 C044: JSR@     IENT?        ; CHECK 5 LEVEL CODE
09 04707 000003      I
10 04710 062677      IORST
11 04711 006120      JSR@     IDELA
12                                RECEIVER
13 04712 020105      LDA      0, QUADR
14 04713 061034      DOA      0, MUX      ; ENABLE RECEIVER
15 04714 126520      SUBZL   1, 1
16 04715 067034      DOC      1, MUX      ; START RECEIVER
17                                TRANSMIT      LOOPBACK, NOPARITY, CODE5, ONESTOP, CL0
18 04716 101400      INC      0, 0      ; ENABLE TRANSMITTER
19 04717 061034      DOA      0, MUX
20 04720 102400      SUB      0, 0      ; TURN OFF TRANSMITTER
21 04721 063034      DOC      0, MUX
22                                LCS      LOOPBACK, NOPARITY, CODE5, ONESTOP, CL0
23 04722 006115      JSR      @.LINCH      ; OUTPUT LINE CHARACTERISTICS
24 04723 100001      100000+LOOPBACK+NOPARITY+CODE5+ONESTOP+CL0
25                                DATACHECK      25
26 04724 006131      JSR@     .CLR
27 04725 024275      LDA      1, C25      ; OUTPUT ONE WORD
28 04726 066034      DOB      1, MUX
29 04727 063634      SKPDN   MUX      ; WAIT FOR RECEIVER COMPLETE
30 04730 000777      JMP      .-1
31 04731 061434      DIB      0, MUX
32 04732 122414      SUB#     1, 0, SZR      ; DOES RECEIVE WORD MATCH?
33 04733 006230      EHALLT           ; NO, CHECK UAR/T
34                                LOOP
35 04734 006227      JSR      @ICYC?E      ; END OF SUBTEST
36
37 04735 006226 C045: JSR@     IENT?        ; CHECK PARITY GENERATION (ODD)
38 04736 000003      I
39 04737 062677      IORST
40 04740 006120      JSR@     IDELA
41                                RECEIVER
42 04741 020105      LDA      0, QUADR
43 04742 061034      DOA      0, MUX      ; ENABLE RECEIVER
44 04743 126520      SUBZL   1, 1
45 04744 067034      DOC      1, MUX      ; START RECEIVER
46                                TRANSMIT      LOOPBACK ODDPARITY, CODE8, ONESTOP, CL0
47 04745 101400      INC      0, 0      ; ENABLE TRANSMITTER
48 04746 061034      DOA      0, MUX
49 04747 102400      SUB      0, 0      ; TURN OFF TRANSMITTER
50 04750 063034      DOC      0, MUX
51                                LCS      LOOPBACK, ODDPARITY, CODE8, ONESTOP, CL0
52 04751 006115      JSR      @.LINCH      ; OUTPUT LINE CHARACTERISTICS
53 04752 100033      100000+LOOPBACK+ODDPARITY+CODE8+ONESTOP+CL0
54                                DATACHECK      377
55 04753 006131      JSR@     .CLR
56 04754 024323      LDA      1, C377      ; OUTPUT ONE WORD
57 04755 066034      DOB      1, MUX
58 04756 063634      SKPDN   MUX      ; WAIT FOR RECEIVER COMPLETE
59 04757 000777      JMP      .-1
60 04760 061434      DIB      0, MUX

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0064 PTID
01 04761 122414 SUB# 1,0,SZR ; DOES RECEIVE WORD MATCH?
02 04762 006230 EHALT ; NO, CHECK UAR/T
03 LOOP
04 04763 006227 JSR @ICYC?E ; END OF SUBTEST
05
06 04764 006226 C046: JSR@ IENT? ; CHECK PARITY GENERATION (EVEN)
07 04765 000003 I
08 04766 062677 IORST
09 04767 006120 JSR@ IDELA
10 RECEIVER
11 04770 020105 LDA 0,QUADR
12 04771 061034 DDA 0,MUX ; ENABLE RECEIVER
13 04772 126520 SUBZL 1,1
14 04773 067034 DOC 1,MUX ; START RECEIVER
15 TRANSMIT LOOPBACK,EVENPARITY,CODE8,ONESTOP,CL0
16 04774 101400 INC 0,0 ; ENABLE TRANSMITTER
17 04775 061034 DDA 0,MUX
18 04776 102400 SUB 0,0 ; TURN OFF TRANSMITTER
19 04777 063034 DOC 0,MUX
20 LCS LOOPBACK,EVENPARITY,CODE8,ONESTOP,CL0
21 05000 006115 JSR @LINCH ; OUTPUT LINE CHARACTERISTICS
22 05001 100035 100000+LOOPBACK+EVENPARITY+CODE8+ONESTOP+CL0
23 DATACHECK 177
24 05002 006131 JSR@ .CLR
25 05003 024313 LDA 1,C177 ; OUTPUT ONE WORD
26 05004 066034 DOB 1,MUX
27 05005 063634 SKPDN MUX ; WAIT FOR RECEIVER COMPLETE
28 05006 000777 JMP .-1
29 05007 061434 DIB 0,MUX
30 05010 122414 SUB# 1,0,SZR ; DOES RECEIVE WORD MATCH?
31 05011 006230 EHALT ; NO, CHECK UAR/T
32 LOOP
33 05012 006227 JSR @ICYC?E ; END OF SUBTEST
34
35
36 05013 006226 C047: JSR@ IENT? ; MAXIMUM BIT GENERATION
37 05014 000003 I
38 05015 062677 IORST
39 05016 006120 JSR@ IDELA
40 RECEIVER
41 05017 020105 LDA 0,QUADR
42 05020 061034 DDA 0,MUX ; ENABLE RECEIVER
43 05021 126520 SUBZL 1,1
44 05022 067034 DOC 1,MUX ; START RECEIVER
45 TRANSMIT LOOPBACK,ODDPARITY,CODE8,TWOSTOP,CL0
46 05023 101400 INC 0,0 ; ENABLE TRANSMITTER
47 05024 061034 DDA 0,MUX
48 05025 102400 SUB 0,0 ; TURN OFF TRANSMITTER
49 05026 063034 DOC 0,MUX
50 LCS LOOPBACK,ODDPARITY,CODE8,TWOSTOP,CL0
51 05027 006115 JSR @LINCH ; OUTPUT LINE CHARACTERISTICS
52 05030 100073 100000+LOOPBACK+ODDPARITY+CODE8+TWOSTOP+CL0
53 DATACHECK 377
54 05031 006131 JSR@ .CLR
55 05032 024323 LDA 1,C377 ; OUTPUT ONE WORD
56 05033 066034 DOB 1,MUX
57 05034 063634 SKPDN MUX ; WAIT FOR RECEIVER COMPLETE
58 05035 000777 JMP .-1
59 05036 061434 DIB 0,MUX
60 05037 122414 SUB# 1,0,SZR ; DOES RECEIVE WORD MATCH?

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0065 PTID
01 05040 006230      EHALT                ;NO, CHECK UAR/T
02                    LOOP
03 05041 006227      JSR    @ICVC?E      ;END OF SUBTEST
04
05 05042 006226 C048: JSR@    IENT?        ;OPPOSITE PARITY (NO BIT
06 05043 000003      I
07 05044 062677      IORST
08 05045 006120      JSR@    IDELA        ;GENERATION)
09                    RECEIVER
10 05046 020105      LDA    0,OUADR
11 05047 061034      DOA    0,MUX        ;ENABLE RECEIVER
12 05050 126520      SUBZL  1,1
13 05051 067034      DOC    1,MUX        ;START RECEIVER
14                    TRANSMIT    LOOPBACK,ODDPARITY,CODE8,ONESTOP,CL0
15 05052 101400      INC    0,0        ;ENABLE TRANSMITTER
16 05053 061034      DOA    0,MUX
17 05054 102400      SUB    0,0        ;TURN OFF TRANSMITTER
18 05055 063034      DOC    0,MUX
19                    LCS    LOOPBACK,ODDPARITY,CODE8,ONESTOP,CL0
20 05056 006115      JSR    @.LINCH      ;OUTPUT LINE CHARACTERISTICS
21 05057 100033      100000+LOOPBACK+ODDPARITY+CODE8+ONESTOP+CL0
22                    DATACHECK    177    ;DATA ALREADY ODD PARITY
23 05060 006131      JSR@    .CLR
24 05061 024313      LDA    1,C177      ;OUTPUT ONE WORD
25 05062 066034      DOB    1,MUX
26 05063 063634      SKPDN  MUX        ;WAIT FOR RECEIVER COMPLETE
27 05064 000777      JMP    .-1
28 05065 061434      DIB    0,MUX
29 05066 122414      SUB#   1,0,SZR     ;DOES RECEIVE WORD MATCH?
30 05067 006230      EHALT                ;NO, CHECK UAR/T
31                    LOOP
32 05070 006227      JSR    @ICVC?E      ;END OF SUBTEST
33
34 05071 006226 C049: JSR@    IENT?        ;OPPOSITE PARITY (NO BIT
35 05072 000003      I
36 05073 062677      IORST
37 05074 006120      JSR@    IDELA        ;GENERATION)
38                    RECEIVER
39 05075 020105      LDA    0,OUADR
40 05076 061034      DOA    0,MUX        ;ENABLE RECEIVER
41 05077 126520      SUBZL  1,1
42 05100 067034      DOC    1,MUX        ;START RECEIVER
43                    TRANSMIT    LOOPBACK,EVENPARITY,CODE8,ONESTOP,CL0
44 05101 101400      INC    0,0        ;ENABLE TRANSMITTER
45 05102 061034      DOA    0,MUX
46 05103 102400      SUB    0,0        ;TURN OFF TRANSMITTER
47 05104 063034      DOC    0,MUX
48                    LCS    LOOPBACK,EVENPARITY,CODE8,ONESTOP,CL0
49 05105 006115      JSR    @.LINCH      ;OUTPUT LINE CHARACTERISTICS
50 05106 100035      100000+LOOPBACK+EVENPARITY+CODE8+ONESTOP+CL0
51                    DATACHECK    377    ;DATA ALREADY EVEN PARITY
52 05107 006131      JSR@    .CLR
53 05110 024323      LDA    1,C377      ;OUTPUT ONE WORD
54 05111 066034      DOB    1,MUX
55 05112 063634      SKPDN  MUX        ;WAIT FOR RECEIVER COMPLETE
56 05113 000777      JMP    .-1
57 05114 061434      DIB    0,MUX
58 05115 122414      SUB#   1,0,SZR     ;DOES RECEIVE WORD MATCH?
59 05116 006230      EHALT                ;NO, CHECK UAR/T
60                    LOOP

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0066 PTID
01 05117 006227 JSR @ICYC?E ;END OF SUBTEST
02
03
04 05120 006226 C050: JSR@ IENT? ;CHECK NO ERRORS ON GOOD
05 05121 000003 I
06 05122 062677 IORST
07 05123 006120 JSR@ IDELA ;TRANSMISSION
08 RECEIVER
09 05124 020105 LDA @, QUADR
10 05125 061034 DDA @, MUX ;ENABLE RECEIVER
11 05126 126520 SUBZL 1, 1
12 05127 067034 DOC 1, MUX ;START RECEIVER
13 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
14 05130 101400 INC @, @ ;ENABLE TRANSMITTER
15 05131 061034 DDA @, MUX
16 05132 102400 SUB @, @ ;TURN OFF TRANSMITTER
17 05133 063034 DOC @, MUX
18 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
19 05134 006115 JSR @, LINC ;OUTPUT LINE CHARACTERISTICS
20 05135 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
21 05136 006131 JSR@ . CLR
22 05137 024323 LDA 1, C377
23 05140 066034 DOB 1, MUX
24 05141 063634 SKPDN MUX
25 05142 000777 JMP . -1
26 05143 062434 DIC @, MUX ;INPUT STATUS WORD
27 05144 101004 MOY @, @, SZR
28 05145 006230 EHALLT ;CHECK DIC CONTROL, O. C.
29 05146 006231 LOOPX ;GATES, UAR/T
30 05147 006226 C051: JSR@ IENT? ;STATUS IS ZERO WITH ODD PARITY
31 05150 000003 I
32 05151 062677 IORST
33 05152 006120 JSR@ IDELA
34 RECEIVER
35 05153 020105 LDA @, QUADR
36 05154 061034 DDA @, MUX ;ENABLE RECEIVER
37 05155 126520 SUBZL 1, 1
38 05156 067034 DOC 1, MUX ;START RECEIVER
39 TRANSMIT LOOPBACK, ODDPARITY, CODE8, ONESTOP, CL0
40 05157 101400 INC @, @ ;ENABLE TRANSMITTER
41 05160 061034 DDA @, MUX
42 05161 102400 SUB @, @ ;TURN OFF TRANSMITTER
43 05162 063034 DOC @, MUX
44 LCS LOOPBACK, ODDPARITY, CODE8, ONESTOP, CL0
45 05163 006115 JSR @, LINC ;OUTPUT LINE CHARACTERISTICS
46 05164 100033 100000+LOOPBACK+ODDPARITY+CODE8+ONESTOP+CL0
47 STATUS 377, 4, SZR
48 05165 006131 JSR@ . CLR ;ONLINE WITH NIOC & DELAY FOR BAUD RATE
49 05166 024323 LDA 1, C377 ;TRANSMIT DATA
50 05167 066034 DOB 1, MUX
51 05170 063634 SKPDN MUX
52 05171 000777 JMP . -1
53 05172 062434 DIC @, MUX ;INPUT STATUS WORD
54 05173 024246 LDA 1, C4 ;LOAD MASK
55 05174 123414 AND# 1, @, SZR ;CHECK STATUS
56 05175 006230 EHALLT ;CHECK UAR/T PAIR
57 LOOP
58 05176 006227 JSR @ICYC?E ;END OF SUBTEST
59
60

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0067 PTID
01 05177 006226 C052: JSR@ IENT? ;STATUS IS ZERO WITH EVEN PARITY
02 05200 000003 I
03 05201 062677 IORST
04 05202 006120 JSR@ IDELA
05 RECEIVER
06 05203 020105 LDA 0,OUADR
07 05204 061034 DDA 0,MUX ;ENABLE RECEIVER
08 05205 126520 SUBZL 1,1
09 05206 067034 DOC 1,MUX ;START RECEIVER
10 TRANSMIT LOOPBACK,EVENPARITY,CODE8,ONESTOP,CL0
11 05207 101400 INC 0,0 ;ENABLE TRANSMITTER
12 05210 061034 DDA 0,MUX
13 05211 102400 SUB 0,0 ;TURN OFF TRANSMITTER
14 05212 063034 DOC 0,MUX
15 LCS LOOPBACK,EVENPARITY,CODE8,ONESTOP,CL0
16 05213 006115 JSR @LINCH ;OUTPUT LINE CHARACTERISTICS
17 05214 100035 100000+LOOPBACK+EVENPARITY+CODE8+ONESTOP+CL0
18 STATUS 177,4,SZR
19 05215 006131 JSR@ .CLR ;ONLINE WITH NIOC & DELAY FOR BAUD RATE
20 05216 024313 LDA 1,C177 ;TRANSMIT DATA
21 05217 066034 DOB 1,MUX
22 05220 063634 SKPDN MUX
23 05221 000777 JMP .-1
24 05222 062434 DIC 0,MUX ;INPUT STATUS WORD
25 05223 024246 LDA 1,C4 ;LOAD MASK
26 05224 123414 AND# 1,0,SZR ;CHECK STATUS
27 05225 006230 EHALLT ;CHECK UAR/T PAIR
28 LOOP
29 05226 006227 JSR @ICYC?E ;END OF SUBTEST
30
31
32 05227 006226 C053: JSR@ IENT? ;STATUS IS ZERO WITH 2 STOP BITS
33 05230 000003 I
34 05231 062677 IORST
35 05232 006120 JSR@ IDELA
36 RECEIVER
37 05233 020105 LDA 0,OUADR
38 05234 061034 DDA 0,MUX ;ENABLE RECEIVER
39 05235 126520 SUBZL 1,1
40 05236 067034 DOC 1,MUX ;START RECEIVER
41 TRANSMIT LOOPBACK,NOPARITY,CODE8,TWOSTOP,CL0
42 05237 101400 INC 0,0 ;ENABLE TRANSMITTER
43 05240 061034 DDA 0,MUX
44 05241 102400 SUB 0,0 ;TURN OFF TRANSMITTER
45 05242 063034 DOC 0,MUX
46 LCS LOOPBACK,NOPARITY,CODE8,TWOSTOP,CL0
47 05243 006115 JSR @LINCH ;OUTPUT LINE CHARACTERISTICS
48 05244 100071 100000+LOOPBACK+NOPARITY+CODE8+TWOSTOP+CL0
49 STATUS 377,10,SZR
50 05245 006131 JSR@ .CLR ;ONLINE WITH NIOC & DELAY FOR BAUD RATE
51 05246 024323 LDA 1,C377 ;TRANSMIT DATA
52 05247 066034 DOB 1,MUX
53 05250 063634 SKPDN MUX
54 05251 000777 JMP .-1
55 05252 062434 DIC 0,MUX ;INPUT STATUS WORD
56 05253 024263 LDA 1,C10 ;LOAD MASK
57 05254 123414 AND# 1,0,SZR ;CHECK STATUS
58 05255 006230 EHALLT ;CHECK UAR/T PAIR
59 LOOP
60 05256 006227 JSR @ICYC?E ;END OF SUBTEST

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0068 PTID

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01
02 05257 006226 C054: JSR@ IENT? ; CODE LEVEL 7 DOES NOT GENERATE
03 05260 000003 I
04 05261 062677 IORST
05 05262 006120 JSR@ IDELA ; FRAMING ERROR
06 RECEIVER
07 05263 020105 LDA 0, QUADR
08 05264 061034 DOA 0, MUX ; ENABLE RECEIVER
09 05265 126520 SUBZL 1, 1
10 05266 067034 DOC 1, MUX ; START RECEIVER
11 TRANSMIT LOOPBACK, NOPARITY, CODE7, ONESTOP, CL0
12 05267 101400 INC 0, 0 ; ENABLE TRANSMITTER
13 05270 061034 DOA 0, MUX
14 05271 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
15 05272 063034 DOC 0, MUX
16 LCS LOOPBACK, NOPARITY, CODE7, ONESTOP, CL0
17 05273 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
18 05274 100021 100000+LOOPBACK+NOPARITY+CODE7+ONESTOP+CL0
19 STATUS 177, 10, SZR
20 05275 006131 JSR@ . CLR ; ONLINE WITH NIOC & DELAY FOR BAUD RATE
21 05276 024313 LDA 1, C177 ; TRANSMIT DATA
22 05277 066034 DOB 1, MUX
23 05300 063634 SKPDN MUX
24 05301 000777 JMP . -1
25 05302 062434 DIC 0, MUX ; INPUT STATUS WORD
26 05303 024263 LDA 1, C10 ; LOAD MASK
27 05304 123414 AND# 1, 0, SZR ; CHECK STATUS
28 05305 006230 EHFLT ; CHECK UAR/T PAIR
29 LOOP
30 05306 006227 JSR @ICYC?E ; END OF SUBTEST
31
32 05307 006226 C055: JSR@ IENT? ; STATUS ZERO WITH CODE LEVEL 7,
33 05310 000003 I
34 05311 062677 IORST
35 05312 006120 JSR@ IDELA ; 2 STOP BITS
36 RECEIVER
37 05313 020105 LDA 0, QUADR
38 05314 061034 DOA 0, MUX ; ENABLE RECEIVER
39 05315 126520 SUBZL 1, 1
40 05316 067034 DOC 1, MUX ; START RECEIVER
41 TRANSMIT LOOPBACK, NOPARITY, CODE7, TWOSTOP, CL0
42 05317 101400 INC 0, 0 ; ENABLE TRANSMITTER
43 05320 061034 DOA 0, MUX
44 05321 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
45 05322 063034 DOC 0, MUX
46 LCS LOOPBACK, NOPARITY, CODE7, TWOSTOP, CL0
47 05323 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
48 05324 100061 100000+LOOPBACK+NOPARITY+CODE7+TWOSTOP+CL0
49 STATUS 177, 10, SZR
50 05325 006131 JSR@ . CLR ; ONLINE WITH NIOC & DELAY FOR BAUD RATE
51 05326 024313 LDA 1, C177 ; TRANSMIT DATA
52 05327 066034 DOB 1, MUX
53 05330 063634 SKPDN MUX
54 05331 000777 JMP . -1
55 05332 062434 DIC 0, MUX ; INPUT STATUS WORD
56 05333 024263 LDA 1, C10 ; LOAD MASK
57 05334 123414 AND# 1, 0, SZR ; CHECK STATUS
58 05335 006230 EHFLT ; CHECK UAR/T PAIR
59 LOOP
60 05336 006227 JSR @ICYC?E ; END OF SUBTEST

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0069 PTID
01
02
03 05337 006226 C056: JSR@ IENT? ; STATUS IS ZERO
04 05340 000003 I
05 05341 062677 IORST
06 05342 006120 JSR@ IDELA
07 RECEIVER
08 05343 020105 LDA 0,OUADR
09 05344 061034 DOA 0,MUX ; ENABLE RECEIVER
10 05345 126520 SUBZL 1,1
11 05346 067034 DOC 1,MUX ; START RECEIVER
12 TRANSMIT LOOPBACK,NOPARITY,CODE6,ONESTOP,CL0
13 05347 101400 INC 0,0 ; ENABLE TRANSMITTER
14 05350 061034 DOA 0,MUX
15 05351 102400 SUB 0,0 ; TURN OFF TRANSMITTER
16 05352 063034 DOC 0,MUX
17 LCS LOOPBACK,NOPARITY,CODE6,ONESTOP,CL0
18 05353 006115 JSR @.LINCH ; OUTPUT LINE CHARACTERISTICS
19 05354 100011 100000+LOOPBACK+NOPARITY+CODE6+ONESTOP+CL0
20 STATUS 77,10,SZR
21 05355 006131 JSR@ .CLR ; ONLINE WITH NIOC & DELAY FOR BAUD RATE
22 05356 024310 LDA 1,C77 ; TRANSMIT DATA
23 05357 066034 DOB 1,MUX
24 05360 063634 SKPDN MUX
25 05361 000777 JMP .-1
26 05362 062434 DIC 0,MUX ; INPUT STATUS WORD
27 05363 024263 LDA 1,C10 ; LOAD MASK
28 05364 123414 AND# 1,0,SZR ; CHECK STATUS
29 05365 006230 EHALLT ; CHECK UAR/T PAIR
30 LOOP
31 05366 006227 JSR @ICYC?E ; END OF SUBTEST
32
33
34 05367 006226 C057: JSR@ IENT? ; STATUS IS ZERO
35 05370 000003 I
36 05371 062677 IORST
37 05372 006120 JSR@ IDELA
38 RECEIVER
39 05373 020105 LDA 0,OUADR
40 05374 061034 DOA 0,MUX ; ENABLE RECEIVER
41 05375 126520 SUBZL 1,1
42 05376 067034 DOC 1,MUX ; START RECEIVER
43 TRANSMIT LOOPBACK,NOPARITY,CODE6,TWOSTOP,CL0
44 05377 101400 INC 0,0 ; ENABLE TRANSMITTER
45 05400 061034 DOA 0,MUX
46 05401 102400 SUB 0,0 ; TURN OFF TRANSMITTER
47 05402 063034 DOC 0,MUX
48 LCS LOOPBACK,NOPARITY,CODE6,TWOSTOP,CL0
49 05403 006115 JSR @.LINCH ; OUTPUT LINE CHARACTERISTICS
50 05404 100051 100000+LOOPBACK+NOPARITY+CODE6+TWOSTOP+CL0
51 STATUS 77,10,SZR
52 05405 006131 JSR@ .CLR ; ONLINE WITH NIOC & DELAY FOR BAUD RATE
53 05406 024310 LDA 1,C77 ; TRANSMIT DATA
54 05407 066034 DOB 1,MUX
55 05410 063634 SKPDN MUX
56 05411 000777 JMP .-1
57 05412 062434 DIC 0,MUX ; INPUT STATUS WORD
58 05413 024263 LDA 1,C10 ; LOAD MASK
59 05414 123414 AND# 1,0,SZR ; CHECK STATUS
60 05415 006230 EHALLT ; CHECK UAR/T PAIR

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0070 PTID
01 LOOP
02 05416 006227 JSR @ICYC?E ;END OF SUBTEST
03
04 05417 006226 C058: JSR@ IENT? ;STATUS IS ZERO
05 05420 000003 I
06 05421 062677 IORST
07 05422 006120 JSR@ IDELA
08 RECEIVER
09 05423 020105 LDA 0,OUADR
10 05424 061034 DOA 0,MUX ;ENABLE RECEIVER
11 05425 126520 SUBZL 1,1
12 05426 067034 DOC 1,MUX ;START RECEIVER
13 TRANSMIT LOOPBACK,NOPARITY,CODE5,ONESTOP,CL0
14 05427 101400 INC 0,0 ;ENABLE TRANSMITTER
15 05430 061034 DOA 0,MUX
16 05431 102400 SUB 0,0 ;TURN OFF TRANSMITTER
17 05432 063034 DOC 0,MUX
18 LCS LOOPBACK,NOPARITY,CODE5,ONESTOP,CL0
19 05433 006115 JSR @.LINCH ;OUTPUT LINE CHARACTERISTICS
20 05434 100001 100000+LOOPBACK+NOPARITY+CODE5+ONESTOP+CL0
21 STATUS 37,10,SZR
22 05435 006131 JSR@ .CLR ;ONLINE WITH NIOC & DELAY FOR BAUD RATE
23 05436 024304 LDA 1,C37 ;TRANSMIT DATA
24 05437 066034 DOB 1,MUX
25 05440 063634 SKPDN MUX
26 05441 000777 JMP .-1
27 05442 062434 DIC 0,MUX ;INPUT STATUS WORD
28 05443 024263 LDA 1,C10 ;LOAD MASK
29 05444 123414 AND# 1,0,SZR ;CHECK STATUS
30 05445 006230 EHALL ;CHECK UAR/T PAIR
31 LOOP
32 05446 006227 JSR @ICYC?E ;END OF SUBTEST
33
34
35 05447 006226 C059: JSR@ IENT? ;STATUS IS ZERO
36 05450 000003 I
37 05451 062677 IORST
38 05452 006120 JSR@ IDELA
39 RECEIVER
40 05453 020105 LDA 0,OUADR
41 05454 061034 DOA 0,MUX ;ENABLE RECEIVER
42 05455 126520 SUBZL 1,1
43 05456 067034 DOC 1,MUX ;START RECEIVER
44 TRANSMIT LOOPBACK,NOPARITY,CODE5,TWOSTOP,CL0
45 05457 101400 INC 0,0 ;ENABLE TRANSMITTER
46 05460 061034 DOA 0,MUX
47 05461 102400 SUB 0,0 ;TURN OFF TRANSMITTER
48 05462 063034 DOC 0,MUX
49 LCS LOOPBACK,NOPARITY,CODE5,TWOSTOP,CL0
50 05463 006115 JSR @.LINCH ;OUTPUT LINE CHARACTERISTICS
51 05464 100041 100000+LOOPBACK+NOPARITY+CODE5+TWOSTOP+CL0
52 STATUS 37,10,SZR
53 05465 006131 JSR@ .CLR ;ONLINE WITH NIOC & DELAY FOR BAUD RATE
54 05466 024304 LDA 1,C37 ;TRANSMIT DATA
55 05467 066034 DOB 1,MUX
56 05470 063634 SKPDN MUX
57 05471 000777 JMP .-1
58 05472 062434 DIC 0,MUX ;INPUT STATUS WORD
59 05473 024263 LDA 1,C10 ;LOAD MASK
60 05474 123414 AND# 1,0,SZR ;CHECK STATUS

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0071 PTID
01 05475 006230      EHALLT          ;CHECK UAR/T PAIR
02                   LOOP
03 05476 006227      JSR    @ICVC?E   ;END OF SUBTEST
04
05
06                   ;TURN OFF MATED RECEIVER
07
08 05477 020105 C059A: LDA    0,OUADR
09 05500 061034      DOA    0,MUX
10 05501 102400      SUB    0,0
11 05502 063034      DOC    0,MUX
12 05503 000401      JMP    C060
13                   ;GENERATE FRAMING ERRORS, PARITY ERRORS , OVERRUN
14
15 05504 006226 C060: JSR@    IENT?          ;CHECK THAT ALTERNATE RECEIVER
16 05505 000003      I
17 05506 062677      IORST
18 05507 006120      JSR@    IDELA          ;WILL INTERRUPT
19                   RECVIN      NOLOOP,ODDPARITY, CODE7, ONESTOP, CL0
20 05510 020106      LDA    0,RECADR      ;TURN ON MATED RECEIVER
21 05511 061034      DOA    0,MUX
22                   LCS    NOLOOP,ODDPARITY, CODE7, ONESTOP, CL0
23 05512 006115      JSR    @.LINCH        ;OUTPUT LINE CHARACTERISTICS
24 05513 100022      100000+NOLOOP+ODDPARITY+CODE7+ONESTOP+CL0
25 05514 102520      SUBZL  0,0            ;START RECEIVER
26 05515 063034      DOC    0,MUX
27 05516 020105      LDA    0,OUADR
28                   TRANSMIT     NOLOOP,NOPARITY, CODE8, ONESTOP, CL0
29 05517 101400      INC    0,0            ;ENABLE TRANSMITTER
30 05520 061034      DOA    0,MUX
31 05521 102400      SUB    0,0            ;TURN OFF TRANSMITTER
32 05522 063034      DOC    0,MUX
33                   LCS    NOLOOP,NOPARITY, CODE8, ONESTOP, CL0
34 05523 006115      JSR    @.LINCH        ;OUTPUT LINE CHARACTERISTICS
35 05524 100030      100000+NOLOOP+NOPARITY+CODE8+ONESTOP+CL0
36 05525 006131      JSR@    .CLR
37 05526 024323      LDA    1,C377
38 05527 066034      DOB    1,MUX
39 05530 006123      JSR@    IDELI
40 05531 063634      SKPDN  MUX
41 05532 006230      EHALLT          ;CHECK UAR/T PAIR, SECONDARY
42 05533 006231      LOOPX          ;RECEIVER DID NOT RECEIVE,
43                   ;LOOPBACK ON SECONDARY LINE
44                   ;FAULTY
45 05534 006226 C060A: JSR@    IENT?          ;PARITY ERROR
46 05535 000003      I
47 05536 062677      IORST
48 05537 006120      JSR@    IDELA
49                   RECVIN      NOLOOP,ODDPARITY, CODE7, ONESTOP, CL0
50 05540 020106      LDA    0,RECADR      ;TURN ON MATED RECEIVER
51 05541 061034      DOA    0,MUX
52                   LCS    NOLOOP,ODDPARITY, CODE7, ONESTOP, CL0
53 05542 006115      JSR    @.LINCH        ;OUTPUT LINE CHARACTERISTICS
54 05543 100022      100000+NOLOOP+ODDPARITY+CODE7+ONESTOP+CL0
55 05544 102520      SUBZL  0,0            ;START RECEIVER
56 05545 063034      DOC    0,MUX
57 05546 020105      LDA    0,OUADR
58                   TRANSMIT     NOLOOP,NOPARITY, CODE8, ONESTOP, CL0
59 05547 101400      INC    0,0            ;ENABLE TRANSMITTER
60 05550 061034      DOA    0,MUX

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0072 PTID
01 05551 102400 SUB 0,0 ;TURN OFF TRANSMITTER
02 05552 063034 DOC 0,MUX
03 LCS NOLOOP,NOPARITY,CODE8,ONESTOP,CL0
04 05553 006115 JSR @.LINCH ;OUTPUT LINE CHARACTERISTICS
05 05554 100030 100000+NOLoop+NOPARITY+CODE8+ONESTOP+CL0
06 STATUS 377,4,SNR
07 05555 006131 JSR@ .CLR ;ONLINE WITH NIOC & DELAY FOR BAUD RATE
08 05556 024323 LDA 1,C377 ;TRANSMIT DATA
09 05557 066034 DOB 1,MUX
10 05560 063634 SKPDN MUX
11 05561 000777 JMP .-1
12 05562 062434 DIC 0,MUX ;INPUT STATUS WORD
13 05563 024246 LDA 1,C4 ;LOAD MASK
14 05564 123415 AND# 1,0,SNR ;CHECK STATUS
15 05565 006230 EHALLT ;CHECK UAR/T PAIR
16 LOOP
17 05566 006227 JSR @ICVC?E ;END OF SUBTEST
18
19 05567 006226 C061: JSR@ IENT? ;PARITY ERROR
20 05570 000003 I
21 05571 062677 IORST
22 05572 006120 JSR@ IDELA
23 RECVIN NOLOOP,ODDPARITY,CODE8,ONESTOP,CL0
24 05573 020106 LDA 0,RECADR ;TURN ON MATED RECEIVER
25 05574 061034 DOA 0,MUX
26 LCS NOLOOP,ODDPARITY,CODE8,ONESTOP,CL0
27 05575 006115 JSR @.LINCH ;OUTPUT LINE CHARACTERISTICS
28 05576 100032 100000+NOLoop+ODDPARITY+CODE8+ONESTOP+CL0
29 05577 102520 SUBZL 0,0 ;START RECEIVER
30 05600 063034 DOC 0,MUX
31 05601 020105 LDA 0,OUADR
32 TRANSMIT NOLOOP,EVENPARITY,CODE8,ONESTOP,CL0
33 05602 101400 INC 0,0 ;ENABLE TRANSMITTER
34 05603 061034 DOA 0,MUX
35 05604 102400 SUB 0,0 ;TURN OFF TRANSMITTER
36 05605 063034 DOC 0,MUX
37 LCS NOLOOP,EVENPARITY,CODE8,ONESTOP,CL0
38 05606 006115 JSR @.LINCH ;OUTPUT LINE CHARACTERISTICS
39 05607 100034 100000+NOLoop+EVENPARITY+CODE8+ONESTOP+CL0
40 STATUS 177,4,SNR
41 05610 006131 JSR@ .CLR ;ONLINE WITH NIOC & DELAY FOR BAUD RATE
42 05611 024313 LDA 1,C177 ;TRANSMIT DATA
43 05612 066034 DOB 1,MUX
44 05613 063634 SKPDN MUX
45 05614 000777 JMP .-1
46 05615 062434 DIC 0,MUX ;INPUT STATUS WORD
47 05616 024246 LDA 1,C4 ;LOAD MASK
48 05617 123415 AND# 1,0,SNR ;CHECK STATUS
49 05620 006230 EHALLT ;CHECK UAR/T PAIR
50 LOOP
51 05621 006227 JSR @ICVC?E ;END OF SUBTEST
52
53 05622 006226 C062: JSR@ IENT? ;PARITY ERROR
54 05623 000003 I
55 05624 062677 IORST
56 05625 006120 JSR@ IDELA
57 RECVIN NOLOOP,EVENPARITY,CODE7,ONESTOP,CL0
58 05626 020106 LDA 0,RECADR ;TURN ON MATED RECEIVER
59 05627 061034 DOA 0,MUX
60 LCS NOLOOP,EVENPARITY,CODE7,ONESTOP,CL0

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0073 PTID
01 05630 006115 JSR @.LINCH ; OUTPUT LINE CHARACTERISTICS
02 05631 100024 100000+NOLoop+EVENPARITY+CODE7+ONESTOP+CL0
03 05632 102520 SUBZL 0,0 ; START RECEIVER
04 05633 063034 DOC 0,MUX
05 05634 020105 LDA 0,OUADR
06 TRANSMIT NOLOOP,NOPARITY, CODE8, ONESTOP, CL0
07 05635 101400 INC 0,0 ; ENABLE TRANSMITTER
08 05636 061034 DOA 0,MUX
09 05637 102400 SUB 0,0 ; TURN OFF TRANSMITTER
10 05640 063034 DOC 0,MUX
11 LCS NOLOOP,NOPARITY, CODE8, ONESTOP, CL0
12 05641 006115 JSR @.LINCH ; OUTPUT LINE CHARACTERISTICS
13 05642 100030 100000+NOLoop+NOPARITY+CODE8+ONESTOP+CL0
14 STATUS 177,4,SNR
15 05643 006131 JSR@ .CLR ; ONLINE WITH NIOC & DELAY FOR BAUD RATE
16 05644 024313 LDA 1,C177 ; TRANSMIT DATA
17 05645 066034 DOB 1,MUX
18 05646 063634 SKPDN MUX
19 05647 000777 JMP .-1
20 05650 062434 DIC 0,MUX ; INPUT STATUS WORD
21 05651 024246 LDA 1,C4 ; LOAD MASK
22 05652 123415 AND# 1,0,SNR ; CHECK STATUS
23 05653 006230 EHALT ; CHECK UAR/T PAIR
24 LOOP
25 05654 006227 JSR @ICVC?E ; END OF SUBTEST
26
27 05655 006226 0063: JSR@ IENT? ; PARITY ERROR
28 05656 000003 I
29 05657 062677 IORST
30 05660 006120 JSR@ IDELA
31 RECVIN NOLOOP,EVENPARITY, CODE8, ONESTOP, CL0
32 05661 020106 LDA 0,RECADR ; TURN ON MATED RECEIVER
33 05662 061034 DOA 0,MUX
34 LCS NOLOOP,EVENPARITY, CODE8, ONESTOP, CL0
35 05663 006115 JSR @.LINCH ; OUTPUT LINE CHARACTERISTICS
36 05664 100034 100000+NOLoop+EVENPARITY+CODE8+ONESTOP+CL0
37 05665 102520 SUBZL 0,0 ; START RECEIVER
38 05666 063034 DOC 0,MUX
39 05667 020105 LDA 0,OUADR
40 TRANSMIT NOLOOP,ODDPARITY, CODE8, ONESTOP, CL0
41 05670 101400 INC 0,0 ; ENABLE TRANSMITTER
42 05671 061034 DOA 0,MUX
43 05672 102400 SUB 0,0 ; TURN OFF TRANSMITTER
44 05673 063034 DOC 0,MUX
45 LCS NOLOOP,ODDPARITY, CODE8, ONESTOP, CL0
46 05674 006115 JSR @.LINCH ; OUTPUT LINE CHARACTERISTICS
47 05675 100032 100000+NOLoop+ODDPARITY+CODE8+ONESTOP+CL0
48 STATUS 377,4,SNR
49 05676 006131 JSR@ .CLR ; ONLINE WITH NIOC & DELAY FOR BAUD RATE
50 05677 024323 LDA 1,C377 ; TRANSMIT DATA
51 05700 066034 DOB 1,MUX
52 05701 063634 SKPDN MUX
53 05702 000777 JMP .-1
54 05703 062434 DIC 0,MUX ; INPUT STATUS WORD
55 05704 024246 LDA 1,C4 ; LOAD MASK
56 05705 123415 AND# 1,0,SNR ; CHECK STATUS
57 05706 006230 EHALT ; CHECK UAR/T PAIR
58 LOOP
59 05707 006227 JSR @ICVC?E ; END OF SUBTEST
60

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0074 PTID
01          ;FRAMING ERRORS
02
03 05710 006226 C064: JSR@  IENT?
04 05711 000003      I
05 05712 062677      IORST
06 05713 006120      JSR@  IDELA
07          RECVIN      NOLOOP, NOPARITY, CODE7, ONESTOP, CL0
08 05714 020106      LDA  0, RECADR      ;TURN ON MATED RECEIVER
09 05715 061034      DOR  0, MUX
10          LCS  NOLOOP, NOPARITY, CODE7, ONESTOP, CL0
11 05716 006115      JSR  @. LINCH      ;OUTPUT LINE CHARACTERISTICS
12 05717 100020      100000+NOLOOP+NOPARITY+CODE7+ONESTOP+CL0
13 05720 102520      SUBZL 0, 0      ;START RECEIVER
14 05721 063034      DOC  0, MUX
15 05722 020105      LDA  0, OUADR
16          TRANSMIT     NOLOOP, NOPARITY, CODE8, ONESTOP, CL0
17 05723 101400      INC  0, 0      ;ENABLE TRANSMITTER
18 05724 061034      DOR  0, MUX
19 05725 102400      SUB  0, 0      ;TURN OFF TRANSMITTER
20 05726 063034      DOC  0, MUX
21          LCS  NOLOOP, NOPARITY, CODE8, ONESTOP, CL0
22 05727 006115      JSR  @. LINCH      ;OUTPUT LINE CHARACTERISTICS
23 05730 100030      100000+NOLOOP+NOPARITY+CODE8+ONESTOP+CL0
24          STATUS 0, 10, SNR
25 05731 006131      JSR@  . CLR      ;ONLINE WITH NIOC & DELAY FOR BAUD RATE
26 05732 024242      LDA  1, C0      ;TRANSMIT DATA
27 05733 066034      DOB  1, MUX
28 05734 063634      SKPDN MUX
29 05735 000777      JMP  . -1
30 05736 062434      DIC  0, MUX      ;INPUT STATUS WORD
31 05737 024263      LDA  1, C10     ;LOAD MASK
32 05740 123415      AND# 1, 0, SNR  ;CHECK STATUS
33 05741 006230      EHALT      ;CHECK UAR/T PAIR
34          LOOP
35 05742 006227      JSR  @ICYC?E     ;END OF SUBTEST
36
37 05743 006226 C066: JSR@  IENT?      ;CHECK TWO STOP CODE
38 05744 000003      I
39 05745 062677      IORST
40 05746 006120      JSR@  IDELA      ;TRANSMISSION
41          RECVIN      NOLOOP, NOPARITY, CODE8, ONESTOP, CL0
42 05747 020106      LDA  0, RECADR      ;TURN ON MATED RECEIVER
43 05750 061034      DOR  0, MUX
44          LCS  NOLOOP, NOPARITY, CODE8, ONESTOP, CL0
45 05751 006115      JSR  @. LINCH      ;OUTPUT LINE CHARACTERISTICS
46 05752 100030      100000+NOLOOP+NOPARITY+CODE8+ONESTOP+CL0
47 05753 102520      SUBZL 0, 0      ;START RECEIVER
48 05754 063034      DOC  0, MUX
49 05755 020105      LDA  0, OUADR
50          TRANSMIT     NOLOOP, NOPARITY, CODE6, TWOSTOP, CL0
51 05756 101400      INC  0, 0      ;ENABLE TRANSMITTER
52 05757 061034      DOR  0, MUX
53 05760 102400      SUB  0, 0      ;TURN OFF TRANSMITTER
54 05761 063034      DOC  0, MUX
55          LCS  NOLOOP, NOPARITY, CODE6, TWOSTOP, CL0
56 05762 006115      JSR  @. LINCH      ;OUTPUT LINE CHARACTERISTICS
57 05763 100050      100000+NOLOOP+NOPARITY+CODE6+TWOSTOP+CL0
58 05764 006131      JSR@  . CLR
59 05765 126400      SUB  1, 1
60 05766 066034      DOB  1, MUX

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0075 PTID
01 05767 006122 JSR@ IDEL
02 05770 102520 SUBZL 0,0 ;TURN ON TRANSMITTER
03 05771 063034 DOC 0,MUX
04 05772 063634 SKPDN MUX ;WAIT FOR TRANSMIT INTERRUPT
05 05773 000777 JMP .-1
06 05774 060234 NIOC MUX ;CLEAR DONE
07 05775 066034 DOB 1,MUX ;TRANSMIT CHARACTER AGAIN
08 05776 067034 DOC 1,MUX ;TURN OFF TRANSMITTER
09 05777 063634 SKPDN MUX
10 06000 000777 JMP .-1
11 06001 024320 LDA 1,C300
12 06002 061434 DIB 0,MUX
13 06003 122414 SUB# 1,0,SZR
14 06004 006230 EHFLT ;CHECK UAR/T PAIR
15 06005 006231 LOOPX
16 06006 006226 C067: JSR@ IENT? ;CHECK ONESTOP CODE
17 06007 000003 I
18 06010 062677 IORST
19 06011 006120 JSR@ IDELA ;TRANSMISSION
20 RECVIN NOLOOP,NOPARITY, CODE8, ONESTOP, CL0
21 06012 020106 LDA 0,RECADR ;TURN ON MATED RECEIVER
22 06013 061034 DOA 0,MUX
23 LCS NOLOOP,NOPARITY, CODE8, ONESTOP, CL0
24 06014 006115 JSR @.LINCH ;OUTPUT LINE CHARACTERISTICS
25 06015 100030 100000+NOLOOP+NOPARITY+CODE8+ONESTOP+CL0
26 06016 102520 SUBZL 0,0 ;START RECEIVER
27 06017 063034 DOC 0,MUX
28 06020 020105 LDA 0,OUADR
29 TRANSMIT NOLOOP,NOPARITY, CODE6, ONESTOP, CL0
30 06021 101400 INC 0,0 ;ENABLE TRANSMITTER
31 06022 061034 DOA 0,MUX
32 06023 102400 SUB 0,0 ;TURN OFF TRANSMITTER
33 06024 063034 DOC 0,MUX
34 LCS NOLOOP,NOPARITY, CODE6, ONESTOP, CL0
35 06025 006115 JSR @.LINCH ;OUTPUT LINE CHARACTERISTICS
36 06026 100010 100000+NOLOOP+NOPARITY+CODE6+ONESTOP+CL0
37 06027 006131 JSR@ .CLR
38 06030 126400 SUB 1,1
39 06031 066034 DOB 1,MUX ;TRANSMIT ZERO CHARACTER
40 06032 006122 JSR@ IDEL
41 06033 102520 SUBZL 0,0 ;TURN ON TRANSMITTER
42 06034 063034 DOC 0,MUX
43 06035 063634 SKPDN MUX ;WAIT FOR INTERRUPT
44 06036 000777 JMP .-1
45 06037 060234 NIOC MUX ;CLEAR DONE
46 06040 066034 DOB 1,MUX ;TRANSMIT AGAIN
47 06041 067034 DOC 1,MUX ;TURN OFF TRANSMITTER
48 06042 063634 SKPDN MUX ;WAIT FOR RECEIVE INTERRUPT
49 06043 000777 JMP .-1
50 06044 024311 LDA 1,C100
51 06045 061434 DIB 0,MUX ;INPUT CHARACTER
52 06046 122414 SUB# 1,0,SZR ;DOES IT MATCH?
53 06047 006230 EHFLT ;NO,CHECK TRANSMIT UAR/T
54 06050 006231 LOOPX
55 06051 006226 C070: JSR@ IENT?
56 06052 000003 I
57 06053 062677 IORST
58 06054 006120 JSR@ IDELA
59 06055 020106 LDA 0,RECADR
60 06056 061034 DOA 0,MUX

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0076 PTID
01 06057 020072 LDA 0, CLK0
02 06060 024073 LDA 1, CLK1
03 06061 030437 LDA 2, CB71+1 ; WHICH CLOCK IS FASTEST?
04 06062 106433 SUBZ# 0, 1, SNC
05 06063 030434 LDA 2, CB71
06 06064 050406 STA 2, SPACE ; CLK1 IS FASTER-RECEIVE CLOCK
07 06065 030433 LDA 2, CB71+1
08 06066 106432 SUBZ# 0, 1, SZC
09 06067 030430 LDA 2, CB71
10 06070 050413 STA 2, MARK ; CLK0 IS FASTER
11 06071 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
12 06072 000000 SPACE: 0
13 06073 102520 SUBZL 0, 0 ; START RECEIVER
14 06074 063034 DOC 0, MUX
15 06075 020105 LDA 0, QUADR
16 06076 101400 INC 0, 0 ; ENABLE TRANSMITTER
17 06077 061034 DOR 0, MUX
18 06100 102400 SUB 0, 0
19 06101 063034 DOC 0, MUX ; TURN OFF TRANSMITTER
20 06102 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
21 06103 000000 MARK: 0
22 STATUS 0, 10, SNR
23 06104 006131 JSR@ . CLR ; ONLINE WITH NIOC & DELAY FOR BAUD RATE
24 06105 024242 LDA 1, C0 ; TRANSMIT DATA
25 06106 066034 DOB 1, MUX
26 06107 063634 SKPDN MUX
27 06110 000777 JMP . -1
28 06111 062434 DIC 0, MUX ; INPUT STATUS WORD
29 06112 024263 LDA 1, C10 ; LOAD MASK
30 06113 123415 AND# 1, 0, SNR ; CHECK STATUS
31 06114 006230 EHALLT ; CHECK UAR/T PAIR
32 LOOP
33 06115 006227 JSR @ICYC?E ; END OF SUBTEST
34
35 06116 000403 JMP . +3
36 06117 100030 CB71: 100030 ; NOLOOP, NOPARITY, CODE8, ONESTOP, CL0
37 06120 100230 100230 ; NOLOOP, NOPARITY, CODE8, ONESTOP, CL1
38 06121 006226 C071: JSR@ IENT? ; CHECK RCVR POLL BY TURNING
39 06122 000003 I
40 06123 062677 IORST
41 06124 006120 JSR@ IDELA ; ON BOTH RECEIVERS AND
42 RECEIVER ; TRANSMITTERS AND WAITING
43 06125 020105 LDA 0, QUADR
44 06126 061034 DOR 0, MUX ; ENABLE RECEIVER
45 06127 126520 SUBZL 1, 1
46 06130 067034 DOC 1, MUX ; START RECEIVER
47 ; FOR A RECEIVE INTERRUPT
48 ; THE NEXT INTERRUPT FOL-
49 ; LOWING SHOULD ALSO BE A
50 ; RECEIVE
51 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
52 06131 101400 INC 0, 0 ; ENABLE TRANSMITTER
53 06132 061034 DOR 0, MUX
54 06133 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
55 06134 063034 DOC 0, MUX
56 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
57 06135 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
58 06136 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
59 RECVIN LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
60 06137 020106 LDA 0, RECADR ; TURN ON MATED RECEIVER

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0077 PTID
01 06140 061034 D0A 0, MUX
02 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
03 06141 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
04 06142 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
05 06143 102520 SUBZL 0, 0 ; START RECEIVER
06 06144 063034 DOC 0, MUX
07 06145 020105 LDA 0, QUADR
08 06146 030106 LDA 2, RECADR ; ADDRESS SECONDARY LINE
09 06147 151400 INC 2, 2
10 06150 071034 D0A 2, MUX
11 06151 102400 SUB 0, 0
12 06152 063034 DOC 0, MUX ; TURN OFF ITS XMITTER
13 06153 060234 NIOC MUX ; GO ONLINE
14 06154 030105 LDA 2, QUADR
15 06155 151400 INC 2, 2 ; XMIT CHAR. AND TURN
16 06156 071034 D0A 2, MUX ; ON BOTH XMITTERS
17 06157 126400 SUB 1, 1
18 06160 066034 DOB 1, MUX
19 06161 102520 SUBZL 0, 0
20 06162 063034 DOC 0, MUX
21 06163 030106 LDA 2, RECADR
22 06164 151400 INC 2, 2
23 06165 071034 D0A 2, MUX
24 06166 063034 DOC 0, MUX
25 06167 066034 DOB 1, MUX ; XMIT CHAR
26 06170 063634 SKPDN MUX ; WAIT FOR DONE
27 06171 000777 JMP .-1
28 06172 060634 DIAC 0, MUX ; IS IT A RECEIVE?
29 06173 101222 MOVZR 0, 0, SZC
30 06174 000773 JMP .-5 ; NO, XMIT NEXT CHAR.
31 06175 006123 JSR@ IDELI ; YES, WAIT FOR CHARACTER TO MATURE
32 06176 063634 SKPDN MUX
33 06177 000777 JMP .-1
34 06200 060434 DIA 0, MUX ; MAKE SURE THIS INT. IS A
35 06201 101232 MOVZR# 0, 0, SZC ; RECEIVE!
36 06202 006230 BAD: EHALT ; GOT XMIT INT INSTEAD OF RCVR
37 06203 006231 LOOPX ; CHECK RCVR POLL FLOP AND INPUT TO XMIT AND GATE
38 06204 006226 C071B: JSR@ IENT? ; MAKE SURE SCAN COUNT CARRY RESETS
39 06205 000003 I
40 06206 062677 IORST
41 06207 006120 JSR@ IDELA ; RCVR POLL
42 06210 030105 LDA 2, QUADR
43 06211 071034 D0A 2, MUX
44 06212 126520 SUBZL 1, 1 ; START PRIME RECEIVER
45 06213 067034 DOC 1, MUX
46 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
47 06214 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
48 06215 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
49 06216 151400 INC 2, 2
50 06217 071034 D0A 2, MUX
51 06220 067034 DOC 1, MUX ; START PRIME TRANSMITTER
52 06221 030106 LDA 2, RECADR
53 06222 071034 D0A 2, MUX
54 06223 067034 DOC 1, MUX ; START SECONDARY RECEIVER
55 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
56 06224 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
57 06225 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
58 06226 151400 INC 2, 2
59 06227 071034 D0A 2, MUX
60 06230 067034 DOC 1, MUX ; START SECONDARY XMITTER

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0078 PTID

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01 06231 060234      NIOC  MUX      ; GO ON LINE
02 06232 063634      SKPDN MUX      ; WAIT FOR DONE
03 06233 000777      JMP     .-1     ; IF XMIT, SEND CHARACTER
04 06234 060434      DIA     0, MUX ;
05 06235 101223      MOVZR  0, 0, SNC ; IF RECEIVER, CHECK RCVR POLL
06 06236 000403      JMP     .+3     ; NOT XMITTER!
07 06237 066234      DOBC   1, MUX  ; XMIT AND GO BACK
08 06240 000772      JMP     .-6     ;
09 06241 006123      JSR@   IDELI   ; RECEIVER- WAIT FOR OTHER
10 06242 060234      NIOC  MUX      ; RECEIVER TO FINISH
11 06243 063634      SKPDN MUX
12 06244 000777      JMP     .-1     ;
13 06245 060434      DIA     0, MUX ;
14 06246 101232      MOVZR# 0, 0, SZC ;
15 06247 006230      TBAD:  EHALT   ; CHECK SCAN COUNT CARRY,
16 06250 006231      LOOPX   ; INPUT TO
17                                     ; RCVR POLL FLOP, RCVR OFF DID NOT
18                                     ; RESET RCV RDY
19      ; TURN OFF RECADR RECEIVER AND TRANSMITTER
20
21 06251 030106      C071A: LDA     2, RECADR
22 06252 071034      DOA     2, MUX
23 06253 102400      SUB     0, 0
24 06254 063034      DOC     0, MUX
25 06255 151400      INC     2, 2
26 06256 071034      DOA     2, MUX
27 06257 063034      DOC     0, MUX
28 06260 000401      JMP     C071C
29
30 06261 006226      C071C: JSR@   IENT?   ; CHECK XMTR REPEAT MASK
31 06262 000003      I
32 06263 062677      IORST
33 06264 006120      JSR@   IDELA
34 06265 020105      LDA     0, OUADR
35      TRANSMIT      NOLOOP, NOPARITY, CODE8, ONESTOP, CL0
36 06266 101400      INC     0, 0   ; ENABLE TRANSMITTER
37 06267 061034      DOA     0, MUX
38 06270 102400      SUB     0, 0   ; TURN OFF TRANSMITTER
39 06271 063034      DOC     0, MUX
40      LCS      NOLOOP, NOPARITY, CODE8, ONESTOP, CL0
41 06272 006115      JSR     @ LINC  ; OUTPUT LINE CHARACTERISTICS
42 06273 100030      100000+NOLOOP+NOPARITY+CODE8+ONESTOP+CL0
43 06274 006131      JSR@   . CLR
44 06275 030105      LDA     2, OUADR ; READDRESS TRANSMITTER
45 06276 151400      INC     2, 2
46 06277 071034      DOA     2, MUX
47 06300 126400      SUB     1, 1   ; TRANSMIT ZERO CHARACTER
48 06301 066034      DOB     1, MUX
49 06302 006122      JSR@   IDEL
50 06303 066034      DOB     1, MUX
51 06304 102520      SUBZL  0, 0   ; TURN ON TRANSMITTER
52 06305 063034      DOC     0, MUX
53 06306 063634      SKPDN MUX      ; WAIT FOR TRANSMIT INTERRUPT
54 06307 000777      JMP     .-1
55 06310 060634      DIAC   0, MUX
56 06311 006123      JSR@   IDELI
57 06312 066034      DOB     1, MUX ; TRANSMIT ZERO AGAIN
58 06313 067034      DOC     1, MUX ; TURN OFF TRANSMITTER
59 06314 063734      SKPDZ  MUX      ; DONE SHOULD NOT BE SET
60 06315 006230      EHALT   ; CHECK MASKING LOGIC, XMT RDY

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0079 PTID

01

02 06316 006231

; ALWAYS ON

LOOPX

!0000 PTID

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01 06317 006226 C072: JSR@ IENT? ; OVERRUN- TRANSMIT TWO DATA
02 06320 000003 I
03 06321 062677 IORST
04 06322 006120 JSR@ IDELA ; CHARACTERS WITHOUT SERVICING
05 RECEIVER ; RECEIVE DATA
06 06323 020105 LDA 0, QUADR
07 06324 061034 DOR 0, MUX ; ENABLE RECEIVER
08 06325 126520 SUBZL 1, 1
09 06326 067034 DOC 1, MUX ; START RECEIVER
10 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
11 06327 101400 INC 0, 0 ; ENABLE TRANSMITTER
12 06330 061034 DOR 0, MUX
13 06331 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
14 06332 063034 DOC 0, MUX
15 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
16 06333 006115 JSR @, LINCH ; OUTPUT LINE CHARACTERISTICS
17 06334 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
18 06335 006131 JSR@ . CLR
19 06336 024323 LDA 1, C377
20 06337 066034 DOB 1, MUX ; OUTPUT DATA ONCE
21 06340 006122 JSR@ IDEL
22 06341 102520 SUBZL 0, 0 ; TURN ON TRANSMITTER
23 06342 063034 DOC 0, MUX
24 06343 063634 SKPDN MUX
25 06344 000777 JMP . -1
26 06345 126400 SUB 1, 1
27 06346 067034 DOC 1, MUX ; TURN OFF TRANSMITTER
28 06347 066034 DOB 1, MUX ; OUTPUT AGAIN
29 06350 006123 JSR@ IDELI ; WAIT
30 06351 060234 NIOC MUX
31 06352 063634 SKPDN MUX ; DONE SHOULD STILL BE SET
32 06353 000777 JMP . -1 ; WAIT FOR RECEIVE INTERRUPT
33 06354 062434 DIC 0, MUX ; INPUT STATUS WORD
34 06355 101220 MOVZR 0, 0
35 06356 101233 MOVZR# 0, 0, SNC ; OVERRUN?
36 06357 006230 EHALT ; NO, UAR/T FAULTY
37 06360 006231 LOOPX ; (RECEIVE UAR/T)
38 06361 006226 C073: JSR@ IENT? ; XMIT AND RECEIVE BREAK CHAR.
39 06362 000003 I
40 06363 062677 IORST
41 06364 006123 JSR@ IDELI
42 06365 062677 IORST
43 06366 006120 JSR@ IDELA
44 RECEIVER
45 06367 020105 LDA 0, QUADR
46 06370 061034 DOR 0, MUX ; ENABLE RECEIVER
47 06371 126520 SUBZL 1, 1
48 06372 067034 DOC 1, MUX ; START RECEIVER
49 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
50 06373 101400 INC 0, 0 ; ENABLE TRANSMITTER
51 06374 061034 DOR 0, MUX
52 06375 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
53 06376 063034 DOC 0, MUX
54 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
55 06377 006115 JSR @, LINCH ; OUTPUT LINE CHARACTERISTICS
56 06400 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
57 06401 006131 JSR@ . CLR
58 06402 020413 LDA 0, CB73
59 06403 062034 DOB 0, MUX
60 06404 063634 SKPDN MUX
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0001 PTID

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01 06405 000777      JMP      .-1
02 06406 061434      DIB      0, MUX
03 06407 126400      SUB      1, 1
04 06410 066034      DOB      1, MUX      ; RELEASE BREAK
05 06411 101004      MOV      0, 0, SZR   ; ZERO DATA?
06 06412 006230      EHALLT   ; NO, CHECK UAR/T BREAK
07 06413 006231      LOOPX    ; LOGIC, BDOB
08
09 06414 000402      JMP      .+2
10 06415 040377 CB73: 40377
11 06416 006226 C074: JSR@     IENT?      ; DID BREAK CHARACTER
12 06417 000003      I
13 06420 062677      IORST
14 06421 006123      JSR@     IDELI
15 06422 062677      IORST
16 06423 006120      JSR@     IDELA      ; CREATE FRAMING ERROR?
17      RECEIVER
18 06424 020105      LDA      0, OUADR
19 06425 061034      DOR      0, MUX      ; ENABLE RECEIVER
20 06426 126520      SUBZL   1, 1
21 06427 067034      DOC      1, MUX      ; START RECEIVER
22      TRANSMIT      LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
23 06430 101400      INC      0, 0      ; ENABLE TRANSMITTER
24 06431 061034      DOR      0, MUX
25 06432 102400      SUB      0, 0      ; TURN OFF TRANSMITTER
26 06433 063034      DOC      0, MUX
27      LCS      LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
28 06434 006115      JSR      @ LINC     ; OUTPUT LINE CHARACTERISTICS
29 06435 100031      100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
30 06436 006131      JSR@     . CLR
31 06437 020756      LDA      0, CB73
32 06440 062034      DOB      0, MUX
33 06441 063634      SKPDN   MUX
34 06442 000777      JMP      .-1
35 06443 062434      DIC      0, MUX
36 06444 126400      SUB      1, 1
37 06445 066034      DOB      1, MUX      ; RELEASE BREAK
38 06446 024263      LDA      1, C10
39 06447 123415      AND#    1, 0, SNR   ; FRAMING ERROR?
40 06450 006230      EHALLT   ; NO, CHECK BREAK LOGIC
41 06451 006231      LOOPX
42 06452 006226 C075: JSR@     IENT?      ; TRY XMITTING BREAK CHAR.
43 06453 000003      I
44 06454 062677      IORST
45 06455 006123      JSR@     IDELI
46 06456 062677      IORST
47 06457 006120      JSR@     IDELA      ; WITHOUT DATA BIT 1
48      RECEIVER
49 06460 020105      LDA      0, OUADR
50 06461 061034      DOR      0, MUX      ; ENABLE RECEIVER
51 06462 126520      SUBZL   1, 1
52 06463 067034      DOC      1, MUX      ; START RECEIVER
53      TRANSMIT      LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
54 06464 101400      INC      0, 0      ; ENABLE TRANSMITTER
55 06465 061034      DOR      0, MUX
56 06466 102400      SUB      0, 0      ; TURN OFF TRANSMITTER
57 06467 063034      DOC      0, MUX
58      LCS      LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
59 06470 006115      JSR      @ LINC     ; OUTPUT LINE CHARACTERISTICS
60 06471 100031      100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0

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0082 PTID
01 06472 006131 JSR@ . CLR
02 06473 102400 SUB 0,0
03 06474 062034 DOB 0, MUX ; TRANSMIT ZERO
04 06475 063634 SKPDN MUX
05 06476 000777 JMP . -1
06 06477 062434 DIC 0, MUX
07 06500 101004 MOV 0,0, SZR ; FRAMING ERROR?
08 06501 006230 EHHLT ; YES, DATA INPUT TO
09 06502 006231 LOOPX ; BREAK DECODER
10 06503 006226 C076: JSR@ IENT? ; TRY XMITTING BREAK CHAR. WITH
11 06504 000003 I
12 06505 062677 IORST
13 06506 006120 JSR@ IDELA ; DATA BIT 0 SET
14 RECEIVER
15 06507 020105 LDA 0, QUADR
16 06510 061034 DOA 0, MUX ; ENABLE RECEIVER
17 06511 126520 SUBZL 1,1
18 06512 067034 DOC 1, MUX ; START RECEIVER
19 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
20 06513 101400 INC 0,0 ; ENABLE TRANSMITTER
21 06514 061034 DOA 0, MUX
22 06515 102400 SUB 0,0 ; TURN OFF TRANSMITTER
23 06516 063034 DOC 0, MUX
24 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
25 06517 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
26 06520 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
27 06521 006131 JSR@ . CLR
28 06522 020407 LDA 0, KB140 ; TRANSMIT 140000
29 06523 062034 DOB 0, MUX
30 06524 006123 JSR@ IDELI
31 06525 063734 SKPDZ MUX ; IS DONE SET?
32 06526 006230 EHHLT ; YES, (-DATA0)INPUT TO BDOB
33 06527 006231 LOOPX ; OPEN, BDOB LOGIC
34 06530 000402 JMP . +2
35 06531 140000 KB140: 140000
36 06532 006226 C077: JSR@ IENT? ; TRY XMITTING BREAK CHARACTER
37 06533 000003 I
38 06534 062677 IORST
39 06535 006120 JSR@ IDELA ; WITH DOC
40 RECEIVER
41 06536 020105 LDA 0, QUADR
42 06537 061034 DOA 0, MUX ; ENABLE RECEIVER
43 06540 126520 SUBZL 1,1
44 06541 067034 DOC 1, MUX ; START RECEIVER
45 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
46 06542 101400 INC 0,0 ; ENABLE TRANSMITTER
47 06543 061034 DOA 0, MUX
48 06544 102400 SUB 0,0 ; TURN OFF TRANSMITTER
49 06545 063034 DOC 0, MUX
50 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
51 06546 006115 JSR @. LINCH ; OUTPUT LINE CHARACTERISTICS
52 06547 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
53 06550 006131 JSR@ . CLR
54 06551 020407 LDA 0, KB400
55 06552 063034 DOB 0, MUX
56 06553 006123 JSR@ IDELI
57 06554 063734 SKPDZ MUX ; IS DONE SET?
58 06555 006230 EHHLT ; YES, DOB INPUT TO BDOB
59 06556 006231 LOOPX ; LOGIC OPEN
60 06557 000402 JMP . +2

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0083 PTID
01 06560 040000 KB400: 40000
02 06561 006226 C078: JSR@ IENT? ;CHECK PRIORITY LOGIC
03 06562 000003 I
04 06563 062677 IORST
05 06564 006120 JSR@ IDELA ;(RECEIVE OVER XMIT)
06 RECEIVER ;
07 06565 020105 LDA 0,OUADR
08 06566 061034 DOR 0,MUX ;ENABLE RECEIVER
09 06567 126520 SUBZL 1,1
10 06570 067034 DOC 1,MUX ;START RECEIVER
11 TRANSMIT LOOPBACK,NOPARITY,CODE8,ONESTOP,CL0
12 06571 101400 INC 0,0 ;ENABLE TRANSMITTER
13 06572 061034 DOR 0,MUX
14 06573 102400 SUB 0,0 ;TURN OFF TRANSMITTER
15 06574 063034 DOC 0,MUX
16 LCS LOOPBACK,NOPARITY,CODE8,ONESTOP,CL0
17 06575 006115 JSR @.LINCH ;OUTPUT LINE CHARACTERISTICS
18 06576 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
19 06577 006131 JSR@ .CLR ;ONLINE & DELAY
20 06600 030105 LDA 2,OUADR ;SET UP FOR XMITTER OUTPUT
21 06601 151400 INC 2,2
22 06602 071034 DOR 2,MUX
23 06603 102400 SUB 0,0 ;TRANSMIT
24 06604 062034 DOB 0,MUX
25 06605 102520 SUBZL 0,0 ;TURN ON XMITTER
26 06606 063034 DOC 0,MUX
27 06607 030105 LDA 2,OUADR ;
28 06610 071034 DOR 2,MUX
29 06611 006123 JSR@ IDELI ;WAIT FOR RECEIVE TO MATURE
30 06612 060234 NIOC MUX
31 06613 063634 SKPDN MUX ;WAIT FOR DONE
32 06614 000777 JMP .-1
33 06615 030105 LDA 2,OUADR ;IS IT A PRIME LINE INT.?
34 06616 151220 MOVZR 2,2
35 06617 064434 DIA 1,MUX
36 06620 125220 MOVZR 1,1
37 06621 146414 SUB# 2,1,SZR
38 06622 000770 JMP .-10 ;NO, CLEAR AND WAIT AGAIN
39 06623 125002 MOV 1,1,SZC ;YES, IS IT RECEIVE
40 06624 000411 JMP PBRD ;NO, XMIT- ERROR
41 06625 060234 NIOC MUX ;OK, CLEAR AND WAIT FOR
42 06626 063634 SKPDN MUX ;NEXT PRIME LINE INT.
43 06627 000777 JMP .-1
44 06630 064434 DIA 1,MUX
45 06631 125220 MOVZR 1,1
46 06632 146414 SUB# 2,1,SZR
47 06633 000772 JMP .-6 ;NOT PRIME LINE
48 06634 125003 MOV 1,1,SNC ;OK, THIS ONE SHOULD
49 ;BE XMIT- IT'S NOT
50 ;ONE MORE TIME FOR
51 06635 006230 PBRD: EHALT ;PRIORITY LOGIC
52 06636 006231 LOOPX
53 06637 006226 C079: JSR@ IENT? ;CHECK ONLINE TO XD0B
54 06640 000003 I
55 06641 062677 IORST
56 06642 006120 JSR@ IDELA ;BY TRANSMITTING ONES
57 RECEIVER ;OFF LINE, THEN GOING
58 06643 020105 LDA 0,OUADR
59 06644 061034 DOR 0,MUX ;ENABLE RECEIVER
60 06645 126520 SUBZL 1,1

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0084 PTID

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01 06646 067034 DOC 1, MUX ; START RECEIVER
02 ; ONLINE, XMITTING ZEROS-
03 ; ONLY THE ZEROS SHOULD
04 ; BE RECEIVED
05 TRANSMIT LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
06 06647 101400 INC 0, 0 ; ENABLE TRANSMITTER
07 06650 061034 DOA 0, MUX
08 06651 102400 SUB 0, 0 ; TURN OFF TRANSMITTER
09 06652 063034 DOC 0, MUX
10 LCS LOOPBACK, NOPARITY, CODE8, ONESTOP, CL0
11 06653 006115 JSR @LINCH ; OUTPUT LINE CHARACTERISTICS
12 06654 100031 100000+LOOPBACK+NOPARITY+CODE8+ONESTOP+CL0
13 06655 020323 LDA 0, C377
14 06656 062034 DOB 0, MUX
15 06657 006131 JSR@ . CLR
16 06660 126400 SUB 1, 1
17 06661 066034 DOB 1, MUX
18 06662 063634 SKPDN MUX
19 06663 000777 JMP . -1
20 06664 064434 DIA 1, MUX
21 06665 061434 DIB 0, MUX
22 06666 101004 MOV 0, 0, SZR
23 06667 006230 EHFLT ; ONLINE TO XDOB
24 06670 006231 LOOPX
25 06671 024303 ENDC: LDA 1, C36
26 06672 030071 LDA 2, BDADR
27 06673 147000 ADD 2, 1 ; (4 OR 8) SHIFTED LEFT
28 06674 020105 LDA 0, QUADR ; GET PRESENT ADDRESS
29 06675 122432 SUBZ# 1, 0, SZC ; IS IT LAST ONE?
30 06676 000421 JMP DLP ; YES, CONTINUE
31 06677 101400 INC 0, 0 ; UPDATE PRESENT ADDRESS
32 06700 101400 INC 0, 0
33 06701 040105 STA 0, QUADR
34 06702 024244 LDA 1, C2
35 06703 123414 AND# 1, 0, SZR ; IS QUADR ODD?
36 06704 122401 SUB 1, 0, SKP ; YES, SUBTRACT FOR MATING ADDRESS
37 06705 123000 ADD 1, 0 ; NO, EVEN-ADD FOR MATCHED PAIR
38 06706 040106 STA 0, RECADR
39 06707 004433 JSR MKLINE ; UPDATE PRIMARY ADDRESS
40 06710 000105 QUADR ; COUNTER
41 06711 000104 PRIMLINE
42 06712 004430 JSR MKLINE ; UPDATE SECONDARY ADDRESS
43 06713 000106 RECADR ; COUNTER
44 06714 000107 SECLINE
45 06715 006417 JSR @B5
46 06716 002417 JMP @ZC006 ; RETURN TO TEST
47 ; NEXT UAR/T
48
49 06717 014413 DLP: DSZ DLPM
50 06720 000407 JMP DLP1
51 06721 010203 ISZ PAS?S
52 06722 000401 JMP . +1
53 06723 020410 LDA 0, DLPR0
54 06724 040406 STA 0, DLPM
55 06725 006215 JSR @TIMES?
56 06726 007273 TXTPS
57
58 06727 020071 DLP1: LDA 0, BDADR
59 06730 040105 STA 0, QUADR
60 06731 002405 JMP @ZBEG11

```

0085 PTID

01

02 06732 000001 DLPM: P

03 06733 000001 DLPR0: P

04 06734 001553 .BS: BSET

05 06735 003140 ZC006: C006

06 06736 000540 ZBEG11: BEG11

07 ;SUBROUTINES

08

09 06737 021400 LINC: LDA 0,0,3 ;CREATE LINE CHARACTERISTICS

10 06740 063034 DOC 0,MUX ;WORD FROM SEPARATE

11 06741 001401 JMP 1,3 ;REQUIREMENTS AS

12 ;SPECIFIED BY MACRO LCS

13

14 06742 024304 MKLINE: LDA 1,C37

15 06743 023400 LDA 0,00,3

16 06744 123400 AND 1,0

17 06745 101220 MOVZR 0,0

18 06746 100000 COM 0,0

19 06747 043401 STA 0,01,3 ;STORE IN LINE COUNTER

20 06750 001402 JMP 2,3 ;RETURN

21

22 06751 101400 SUBX: INC 0,0

23 06752 101400 SUBY: INC 0,0

24 06753 061034 DDA 0,MUX

25 06754 152400 SUB 2,2

26 06755 073034 DOC 2,MUX

27 06756 152620 SUBZR 2,2

28 06757 073034 DOC 2,MUX

29 06760 072034 DOB 2,MUX

30 06761 125405 INC 1,1,SNR

31 06762 001401 JMP 1,3

32 06763 001400 JMP 0,3

33

34 ;CLOCK OUT PULSES SUBROUTINE

35

36 06764 100400 CONT: NEG 0,0

37 06765 060334 NIOP MUX

38 06766 101404 INC 0,0,SZR

39 06767 000776 JMP .-2

40 06770 001400 JMP 0,3

41

42 06771 030112 DELI: LDA 2,WATE ;DELAY APPROX. 250 MS

43 06772 000402 JMP .+2

44 06773 030334 DEL: LDA 2,CM4 ;DELAY A LITTLE

45 06774 060400 DIA 0,0 ;JUMP BACK TO HERE (. -11)

46 06775 060400 DIA 0,0

47 06776 060400 DIA 0,0

48 06777 060400 DIA 0,0

49 07000 060400 DIA 0,0

50 07001 060400 DIA 0,0

51 07002 060400 DIA 0,0

52 07003 060400 DIA 0,0

53 07004 060400 DIA 0,0

54 07005 060400 DIA 0,0

55 07006 151404 INC 2,2,SZR

56 07007 000765 JMP .-11

57 07010 001400 JMP 0,3

58 07011 060234 CLR: NIOP MUX ;GO ON LINE AND CLEAR

59 07012 030353 LDA 2,CM512 ;HOW MUCH DELAY

60 07013 000761 JMP DEL+1 ;DELAY FOR BAUD RATE TO FLUSH

```

0086 PTID
01
02
03 07014 030071 WTBSY: LDA 2, BOADR ; ADDRESS BOARD AND WAIT
04 07015 071034 DOA 2, MUX ; FOR BUSY TO GO AWAY
05 07016 063534 SKPBZ MUX ; (ICLR IS COMPLETE)
06 07017 000777 JMP .-1
07 07020 001400 JMP 0, 3
08
09 07021 000000 XXX: 0 ; DUMMY ADDRESS FOR END
10 ; OF TESTING
11
12 07022 040065 CTS: STA 0, AC0?? ; SAVE 0
13 07023 020070 LDA 0, AC3??
14 07024 116415 SUB# 0, 3, SNR ; DID WE DO THIS BEFORE
15 07025 000411 JMP BEFORE ; YES, SO DON'T TELL
16 07026 054070 STA 3, AC3?? ; SAVE ALL REGISTERS
17 07027 050067 STA 2, AC2?? ;
18 07030 044066 STA 1, AC1??
19 07031 006215 JSR @IMES?S ; TELL THE WORLD ABOUT CTS SWITCHES
20 07032 007443 CTS#
21 07033 034070 LDA 3, AC3?? ; RESTORE ALL REGISTERS
22 07034 030067 LDA 2, AC2??
23 07035 024066 LDA 1, AC1??
24 07036 020065 BEFORE: LDA 0, AC0??
25 07037 002230 JMP @IERR? ; NOW GO TO EHALLT
26 ; THE FOLLOWING ROUTINES REPLACE THE OCTAL AND DECIMAL
27 ; INPUT ROUTINES TO SEARCH FOR ^O, ^R, OR ^D AND JUMP TO
28 ; THE APPROPRIATE PLACE IF ONE OF THESE CONTROL CHARS
29 ; IS STRUCK.
30
31
32 ; OCTAL INPUT ROUTINE
33 07040 000000 0
34 07041 054777 TTII: STA 3, -1
35 07042 050425 STA 2, TTS2 ; SAVE AC2
36 07043 006224 JSR@ ITI?0 ; GET CHARACTER
37 07044 004404 JSR TTII1
38 07045 010773 ISZ TTII-1
39 07046 030421 TTII2: LDA 2, TTS2
40 07047 002771 JMP@ TTII-1 ; RETURN+2
41
42 ; ROUTINE LOOKS FOR ^O OR ^R, OR ^D
43 07050 030414 TTIII: LDA 2, TTCO
44 07051 142415 SUB# 2, 0, SNR ; IS IT CONTROL O?
45 07052 006233 JSR@ IODT? ; YES
46 07053 030412 LDA 2, TTCR ; OR CONTROL R?
47 07054 142415 SUB# 2, 0, SNR
48 07055 000234 JMP RES?T ; YES
49 07056 030410 LDA 2, TTCO ; OR CONTROL D?
50 07057 142414 SUB# 2, 0, SZR ;
51 07060 001401 JMP 1, 3 ; RETURN, WITHOUT MAIN RET BUMP
52 07061 102400 SUB 0, 0 ; YES
53 07062 042213 STA@ 0, ISNR?
54 07063 000234 JMP RES?T
55
56
57 07064 000017 TTCO: 17
58 07065 000022 TTCR: 22
59 07066 000004 TTCO: 4
60 07067 000000 TTS2: 0

```

```

0087 PTID
01
02
03          ;DECIMAL INPUT ROUTINE
04 07070 054750 TTID: STA    3,TTII-1      ;DECIMAL INPUT ROUTINE
05 07071 050776     STA    2,TT52        ;KEEP AC2
06 07072 006225     JSR@   ITI?D        ;GET DECIMAL
07 07073 004755     JSR    TTII1
08 07074 010744     ISZ    TTII-1
09 07075 000751     JMP    TTII2
10          000001     .NOMAC X
11 07076 005215 DCURT: .TXTE !<15><12>DCU RTC FAILED TO INTERRUPT !
12 07116 005215 C0BR: .TXTE !<15><12> CLK 0 BAUD RATE !
13 07131 005215 C1BR: .TXTE !<15><12> CLK 1 BAUD RATE !
14 07144 005215 C2BR: .TXTE !<15><12> CLK 2 BAUD RATE !
15 07157 005215 C3BR: .TXTE !<15><12> CLK 3-BAUD RATE !
16 07172 005215 MCODE: .TXTE !<15><12>TYPE 2 DIGIT DEVICE CODE OF PTI(34 OR 44) !
17 07221 005215 PRIME: .TXTE !<15><12>PRIME LINE= !
18 07231 005215 DCUEB: .TXTE !<15><12> UNEXPECTED DCU HALT !
19 07245 005215 MDCUX: .TXTE !<15><12>IS THERE A DCU IN SYSTEM?      (1=YES,0=NO) !
20 07273 005015 TXTPS: .TXT !<15><12>... PASS !
21 07301 005215 MDCU: .TXTE !<15><12>TYPE 2 DIGIT DEVICE CODE OF DCU !
22 07323 126240 SECOND: .TXTE ! , SECONDARY LINE= !
23 07335 005215 BOUND: .TXTE !<15><12> TYPE ADDR OF FIRST LINE IN DECIMAL (0,16,32... 240) !
24 07373 005215 RBCKO: .TXTE !<15><12> TYPE 1 TO RUN BAUD CLOCK ONLY TEST !
25 07417 005215 INPDS: .TXTE !<15><12> TYPE 1 IF NEW PARAMETERS DESIRED !
26 07443 005215 CTSM: .TXTE !<15><12>IF TESTING CTS, PRIMELINE IS EQUAL TO DISABLED LINE !
27          000000     .NOLOC 0

```

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!0088 PTID
01          ;DCU AREA
02          ;THIS SECTION CONTAINS THE CODE FOR THE DCU
03          ;AND THE CODE FOR THE HOST TO RUN THE DCU
04      010000      .LOC      10000          ;DCU IS LOST IF NOT ABOVE 4K BOUNDARY
05 10000 000000 DST:0
06 10001 010002 DCUBF: .+1          ; POINTER TO A BUFFER HOST CAN LOAD AND DCU
07 10002 000100      .BLK      100          ; CAN READ TO LOAD ITS LOW MEMORY
08
09          ;LOAD FIRST 4K OF HOST INTO BUFFER (100 WORDS AT A TIME)
10          ;AND LET DCU READ THE WORDS AND LOAD ITS LOCAL MEMORY
11 10102 004427 DC. ST: JSR      DCUIN          ; INITIALIZE DCU
12 10103 020311      LDA      0, C100
13 10104 040674      STA      0, DST          ; SET UP NUMBER OF TIMES TO LOAD BUFF
14 10105 152400      SUB      2, 2          ; START AT HOST LOC 0
15
16 10106 034673 DCLOO: LDA      3, DCUBF          ; GET BUFFER POINTER
17 10107 024433      LDA      1, CD, 3          ; -=-100
18 10110 021000      LDA      0, 0, 2          ; GET LOW CORE WORD
19 10111 041400      STA      0, 0, 3          ; STORE IN HIGH BUFFER
20 10112 151400      INC      2, 2
21 10113 175400      INC      3, 3
22 10114 125404      INC      1, 1, SZR          ; END OF INNER LOOP?
23 10115 000773      JMP      DCLOO+2          ; NO
24
25 10116 004411      JSR      DCUMV          ; NOW LET DCU MOVE IT
26 10117 014661      DSZ      DST          ; EVERYTHING MOVED?
27 10120 000766      JMP      DCLOO          ; NO, MOVE SOME MORE
28
29 10121 020405      LDA      0, DCGOR          ; EVERTHING MOVED GET DCU START
30 10122 062076      DOB      0, DCU          ; PUT START DCU ADDRESS
31 10123 020244      LDA      0, C2
32 10124 061076      DOR      0, DCU          ; START DCU
33 10125 000454      JMP      HMON          ; WAIT FOR SOME RESPONSE
34 10126 010162 DCGOR: DCUGO
35
36 10127 102520 DCUMV: SUBZL      0, 0          ; MAKE DCU CONT CMD
37 10130 000406      JMP      DCUWT          ; EXECUTE AND WAIT
38
39          ; INITIALIZE DCU
40 10131 062476 DCUIN: DIC      0, DCU          ; SYS RESET DCU
41 10132 020411      LDA      0, CD, 2
42 10133 163000      ADD      3, 0          ; FUDGE UP START ADDRESS
43 10134 062076      DOB      0, DCU          ; GIVE START ADDR TO DCU
44 10135 020244      LDA      0, C2          ; START COMMAND
45 10136 061076 DCUWT: DOR      0, DCU          ; START/CONT COMMAND
46 10137 063576      SKPBZ      DCU          ; WAIT TILL IT STOPS
47 10140 000777      JMP      . -1
48 10141 001400      JMP      0, 3
49 10142 177700 CD. 3:  -100
50 10143 000041 CD. 2:  DCUIJ-1-DC. ST
51          ; PROGRAM TO BE RUN IN DCU
52 10144 152400 DCUIJ: SUB      2, 2          ; CLEAR LOCAL MEM POINTER
53 10145 063077      HALT          ; BACK TO HOST
54 10146 034633      LDA      3, DCUBF          ; GET BUFFER POINTER
55 10147 024773      LDA      1, CD, 3          ; -=-100
56
57 10150 021400 DCIL1: LDA      0, 0, 3          ; GET WORD
58 10151 041000      STA      0, 0, 2          ; KEEP IN BOTTOM
59 10152 151400      INC      2, 2
60 10153 175400      INC      3, 3

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0089 PTID
01 10154 125404 INC 1,1,SZR ;DONE THIS LOOP
02 10155 000773 JMP DCIL1 ;NO
03 10156 063077 HALT ;YES
04 10157 000767 JMP DCIL1-2 ;DO AGRIN
05
06 ;DCU CODE TO SET UP HOST CALLS AND THE RUN DIAG
07 10160 002133 JMP@ IDCRS
08 10161 010174 DCUIO
09 10162 020777 DCUGO: LDA 0,-1
10 10163 040235 STA 0,IOM?0 ;SET UP FAKE IO CALL IN LOCAL
11 ;DCU MEMORY TO HANDLE IO
12 10164 020774 LDA 0,DCUGO-2 ;GET CONTROL R CALL
13 10165 040234 STA 0,RES?T ;PUT IN LOCAL MEMORY
14 10166 102520 SUBZL 0,0 ;DISABLE TTY WAIT CAUSE
15 10167 040211 STA 0,ERR?4 ;DCU DOESN'T HAVE ONE
16 10170 002401 JMP@ .+1
17 10171 000540 BEG11 ;RUN THE TESTS
18 ;DCU IO MOD CALL
19 10172 000000 DXA0: 0
20 10173 000000 DXA3: 0 ;THE HOST WILL MODIFY THIS LOC
21 10174 054777 DCUIO: STA 3,-1 ;DCU GETS HERE ON IOMOD
22 10175 040775 STA 0,DXA0 ;KEEP AC0 FOR HOST
23 10176 063077 HALT ;WAIT FOR HOST
24 10177 020773 LDA 0,DXA0 ;GET AC0 FROM HOST
25 10200 002773 JMP@ DXA3 ;GO BACK TO CALL
26
27 ;HOST MONITOR, HOST SITS HERE WAITING FOR DCU CALLS
28 10201 063476 HMON: SKPBN DCU ;IS DCU HALTED?
29 10202 000403 JMP HDSEr ;YES, FIND OUT WHY
30 10203 000776 JMP HMON ;JUST CYCLE HERE
31
32 10204 006235 KCALL: JSR@ IOM?0
33 10205 034766 HDSEr: LDA 3,DXA3
34 10206 035777 LDA 3,-1,3 ;GET CALLING ROUTINE
35 10207 030775 LDA 2,KCALL
36 10210 156414 SUB# 2,3,SZR ;CALL SHUD = JSR@ IOM?0
37 10211 000500 JMP FDCUE ;DCU ERROR
38 10212 036761 LDA@ 3,DXA3 ;PICK UP DCU CALL
39 10213 010760 ISZ DXA3 ;BUMP FOR LATER RETURN
40 10214 030235 LDA 2,IOM?0 ;SEE IF HOST IO MOD CALL NEEDED
41 10215 151024 MOVZ 2,2,SZR ;SET CARRY IF THERE
42 10216 151040 MOV0 2,2
43 10217 030405 LDA 2,NIOPT ;NO IOMOD PTR
44 10220 151002 MOV 2,2,SZC ;SKIP IF NO IOMOD
45 10221 030411 LDA 2,YIOPT ;IO MMOD POINTER
46 10222 173000 ADD 3,2 ;ADD CALL+1 OP CODE
47 10223 003000 JMP@ 0,2 ;GO SERVICE
48
49 10224 010225 NIOPT: .+1
50 10225 010301 HDIN
51 10226 010252 HDIN0
52 10227 010257 HDTTO
53 10230 010267 HDLPT
54 10231 010315 HDcR ;CONTROL R FROM DCU
55 10232 010233 YIOPT: .+1
56 10233 010305 YIOIN
57 10234 010242 YIOTH
58 10235 010242 YIOTH
59 10236 010242 YIOTH
60 10237 010315 HDcR ;CONTROL R FROM DCU

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0090 PTID
01 10240 006235 DCRES: JSR@ IOM?0 ;DCU PRIVATE CALL FOR "R
02 10241 000004 4
03 ; IOMODULE CALLS
04 10242 054403 YIOTH: STA 3, +3 ;SET UP CALL OPCODE
05 10243 020727 LDA 0, DXA0 ;CALL MIGHT NEED ACB
06 10244 006235 JSR@ IOM?0 ;CALL HOST IOMOD
07 10245 000000 0
08 10246 040724 STA 0, DXA0 ;PUT BACK FOR DCU
09
10 10247 176520 HEXIT: SUBZL 3, 3 ;DCU CONTINUE CMD
11 10250 075076 DOR 3, DCU ;CONTINUE DCU
12 10251 000730 JMP HMON ;WAIT
13
14 10252 063610 HDIN@: SKPDN TTI
15 10253 000777 JMP .-1 ;WAIT FOR INPUT
16 10254 060610 DIAC 0, TTI ;GET CHAR CLEAR DONE
17 10255 040715 STA 0, DXA0 ;PUT WHERE DCU CAN GET
18 10256 000771 JMP HEXIT
19
20 10257 020713 HDTTO: LDA 0, DXA0 ;HOST OUTPUT FROM DCU
21 10260 063511 SKPBZ TTO
22 10261 000777 JMP .-1
23 10262 061111 DORS 0, TTO ;SEND CHAR
24 10263 063511 SKPBZ TTO
25 10264 000777 JMP .-1 ;WAIT FOR NO BUSY
26 10265 060211 NIOC TTO ;RESET DONE
27 10266 000761 JMP HEXIT
28
29 10267 020703 HDLPT: LDA 0, DXA0 ;DCU WORD
30 10270 063517 SKPBZ LPT
31 10271 000777 JMP .-1
32 10272 061117 DORS 0, LPT ;START LPT
33 10273 063517 SKPBZ LPT
34 10274 000777 JMP .-1
35 10275 063517 SKPBZ LPT
36 10276 000775 JMP .-3
37 10277 060217 NIOC LPT
38 10300 000747 JMP HEXIT
39
40 10301 063710 HDIN: SKPDZ TTI ;KEY STRUCK?
41 10302 000752 JMP HDIN@+2 ;YES GET IT
42 10303 010670 ISZ DXA3 ;NO, BUMP RETURN
43 10304 000743 JMP HEXIT
44
45 10305 006235 YI@IN: JSR@ IOM?0
46 10306 000000 0
47 10307 000746 JMP HDIN@+3
48 10310 000773 JMP HDIN+2
49
50 10311 006215 FDCUE: JSR@ IMES?
51 10312 007231 DCUEB ;FATAL DCU ERROR
52 10313 063077 HALT
53 10314 000777 JMP .-1
54
55 ;CONTROL R STRUCK FROM DCU, WAIT FOR SWPACK KEY
56 ;ANOTHER CONTROL R WILL START
57 10315 020235 HDCR: LDA 0, IOM?0 ; IOMODULE ROUTINE
58 10316 101004 MOV 0, 0, SZR
59 10317 000405 JMP .+5 ;USE IOMOD CALL
60 10320 063610 SKPDN TTI ;TTI IS USED

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0091 PTID
01 10321 000777      JMP      .-1
02 10322 006214      JSR@    IINP?      ;SW PACK ENTRY , KEY STRUCK
03 10323 000772      JMP      HOCR      ;ANOTHER KEY?
04 10324 006235      JSR@    IOM?0     ;CALL IOMODULE HANDLER
05 10325 000001      1
06 10326 000774      JMP      .-4
07
08      ;CHANGE ALL DEVICE CODES FROM THE LOCATION IN CALL+2
09      ;UP TO BUT NOT THE LOCATION IN CALL+3, FROM THE OLD CODE
10      ;WHOSE ADDRESS IS IN CALL+1 TO WHAT IS IN AC0.
11      ;IGNORES CODE 77
12      ;EXIT TO CALL+4
13 10327 171400 DCHNG: INC      3,2
14 10330 151400      INC      2,2
15 10331 050441      STA      2,DCH.5
16 10332 024441      LDA      1,DCH.1
17 10333 037376      LDA      3,0-2,2
18 10334 137400      AND      1,3
19 10335 057376      STA      3,0-2,2
20 10336 123400      AND      1,0
21 10337 040435      STA      0,DCH.6
22 10340 031377      LDA      2,-1,2
23 10341 136414      SUB#     1,3, SZR
24 10342 122415      SUB#     1,0, SNR
25 10343 000424      JMP      DCH.2
26 10344 021000 DCH.4: LDA      0,0,2
27 10345 103112      ADDL#    0,0, SZC      ; IS IT AN I.O. INSTR?
28 10346 101103      MOVL     0,0, SNC
29 10347 103113      ADDL#    0,0, SNC
30 10350 000412      JMP      DCH.3      ; NO
31 10351 101200      MOVR     0,0
32 10352 162400      SUB      3,0
33 10353 123414      AND#     1,0, SZR
34 10354 000406      JMP      DCH.3      ; NOT OLD DEVICE CODE
35 10355 034417      LDA      3,DCH.6
36 10356 163000      ADD      3,0
37 10357 041000      STA      0,0,2
38 10360 034412      LDA      3,DCH.5
39 10361 037776      LDA      3,0-2,3
40 10362 151400 DCH.3: INC      2,2
41 10363 022407      LDA      0,0DCH.5
42 10364 142414      SUB#     2,0, SZR
43 10365 000757      JMP      DCH.4
44 10366 034406      LDA      3,DCH.6
45 10367 030403 DCH.2: LDA      2,DCH.5
46 10370 057376      STA      3,0-2,2
47 10371 001001      JMP      1,2
48 10372 000000 DCH.5: 0
49 10373 000077 DCH.1: 77
50 10374 000000 DCH.6: 0
51      ;ROUTINE TO PRINTOUT PRIME AND SECOND LINES
52
53 10375 000000      0
54 10376 054777 PSD1: STA      3,.-1
55 10377 006215      JSR@    INES?
56 10400 007221      PRIME   ;PRIME LINE=
57 10401 024104      LDA      1,PRIML
58 10402 124000      COM     1,1
59 10403 020071      LDA      0,BDADR
60 10404 101220      MOVZR   0,0

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0092 PTID
01 10405 107000 ADD 0,1 ;CALCULATE SEND LINE
02 10406 006220 JSR@ IPDE? ;PRINT
03 10407 006215 JSR@ IMES?
04 10410 007323 SECOND ;SECONDARY LINE
05 10411 024107 LDA 1,SECLI
06 10412 124000 COM 1,1 ;CALCULATE RCY LINE
07 10413 020071 LDA 0,BDADR
08 10414 101220 MOVZR 0,0
09 10415 107000 ADD 0,1
10 10416 006220 JSR@ IPDE?
11 10417 002756 JMP@ PSD1-1
12
13 ;?DTD 2
14 006240 BDDDD= JSR@ IPSD1
15 12175 000000 EGGS: 0 ; AUTO RUN SWITCH
16 12176 000000 0 ; DEVICE CODE
17 12177 000000 0 ; CAT SWITCH
18 12200 000000 0 ; # OF PASSES
19 12201 000000 0 ; RETURN ADDRESS
20 12202 000000 SWREG: 0 ; SWITCH REGISTER
21 12203 005215 DIRT: .TXTE !<15><12>... C.S.I. PTI DIAG REV. 01 !
22 000000 .NOLOC 0
23 .END
**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS

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0093 PTID

A000	000550	15/18	17/03						
A001	000556	17/10							
A002	000564	17/17							
A003	000572	17/26							
A004	000603	17/37	17/57						
A005	000627	17/59							
A006	000643	18/12							
A007	000653	18/21							
A008	000662	18/29							
A009	000671	18/37							
A010	000704	18/53							
A011	000717	19/06							
A012	000733	19/20							
A013	000746	19/34							
A014	000761	19/48							
A015	000774	20/03							
A016	001014	20/23							
A017	001034	20/40							
A018	001043	20/50							
A019	001057	21/06							
A020	001101	21/28							
A021	001117	21/46							
A022	001134	22/03							
A023	001153	22/20							
A024	001174	22/40							
A026	001215	22/59							
A027	001237	23/20							
A028	001261	23/40							
A029	001306	24/01	24/04						
A029A	001314	24/11							
A030	001341	24/06	24/38						
A030G	001364	24/55	25/01						
A031	001401	24/09	24/34	25/06	25/14				
A031E	001372	24/60	25/07						
A032	001416	25/30							
A033	001431	25/44							
A034	001442	25/53							
A035	001455	26/05							
A036	001472	26/21							
A037	001511	26/38							
A038	001522	26/49							
A039	001535	27/03							
A3010	001340	24/37							
A30TX	001337	24/36	24/58						
AC0?	011772	92/15							
AC0??	000065	11/44	86/12	86/24					
AC1?	011773	92/15							
AC1??	000066	11/45	86/18	86/23					
AC2?	011774	92/15							
AC2??	000067	11/46	86/17	86/22					
AC3?	000207	12/37	92/15						
AC3??	000070	11/47	14/41	86/13	86/16	86/21			
ADROU	030510	MC	7/59	18/40	18/56	19/09	19/24	19/38	19/52
			20/56	21/15	21/33	21/51	22/08	22/29	22/48
			23/08	23/28	23/48	24/21	24/47	25/19	25/34
			26/10	26/26	26/54	27/08	28/24	28/45	29/06
			29/18	29/33	29/43	30/04	30/14	30/34	30/44
			31/02	31/12	31/30	31/40	31/59	32/09	32/27
			32/37	32/56	33/06	33/28	33/38	33/59	34/09

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		34/31	34/41	35/02	35/12	35/34	35/44	36/05
		36/15	36/37	36/47	37/07	37/17	37/45	38/28
		39/07	39/45	43/12	43/40	44/06	44/26	44/41
		45/06	45/14	46/07	46/14	46/38	46/46	47/06
		47/14	47/38	47/46	48/11	48/19	48/41	48/49
		49/13	49/36	50/09	50/17			
AMASK	000060	11/36	26/32	26/44				
ATT	002705	40/52	41/19	41/54				
B000	001571	28/19						
B001	001607	28/40						
B003	001626	29/01						
B004	001651	29/28						
B005	001700	29/59						
B006	001727	30/29						
B007	001756	30/57						
B008	002005	31/25						
B009	002034	31/54						
B00A	001570	27/18	28/17					
B010	002063	32/22						
B010A	002402	37/02						
B010C	002112	32/50						
B010D	002141	33/22						
B010E	002170	33/53						
B010F	002217	34/25						
B010G	002246	34/56						
B010H	002275	35/28						
B010J	002324	35/59						
B010K	002353	36/31						
B20	002440	37/28	37/41					
B20A	002467	38/03	38/11					
B20B	002473	38/15						
B21	002476	38/24						
B21A	002525	38/46	38/54					
B21B	002531	38/58						
B21X	002474	38/09	38/19					
B21XX	002430	37/30	38/19					
B22	002532	38/52	39/03					
B22A	002561	39/25	39/33					
B23	002566	39/31	39/41					
B23A	002615	40/03	40/11					
BAD	006202	77/36						
BADR	000071	11/48	14/34	15/28	17/29	18/41	18/57	19/10
		19/25	19/39	19/53	20/06	20/10	20/26	20/30
		20/57	21/16	21/34	21/52	22/09	22/30	22/49
		23/09	23/29	23/49	24/22	24/48	25/20	25/35
		26/11	26/27	26/34	26/55	27/09	28/04	28/09
		28/25	28/46	29/07	29/19	29/34	29/44	30/05
		30/15	30/35	30/45	31/03	31/13	31/31	31/41
		31/60	32/10	32/28	32/38	32/57	33/07	33/29
		33/39	33/60	34/10	34/32	34/42	35/03	35/13
		35/35	35/45	36/06	36/16	36/38	36/48	37/08
		37/18	37/46	38/29	39/08	39/46	43/13	43/18
		43/41	44/07	44/11	44/27	44/42	45/07	45/15
		46/08	46/15	46/39	46/47	47/07	47/15	47/39
		47/47	48/12	48/20	48/42	48/50	49/14	49/37
		50/10	50/18	84/26	84/58	86/03	91/59	92/07
B0CKK	000130	12/21	14/52	15/02	40/18			
B0DDD	006240	92/14	92/15					

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BDRNN	002622	40/09	40/18				
BEFOR	007036	86/15	86/24				
BEG0	000474	14/48	14/51	15/34			
BEG1	000402	12/31	14/31				
BEG11	000540	15/38	15/46	16/11	85/06	89/17	
BEG1A	000430	14/44	14/54				
BEG1X	000541	14/29	16/12				
BEG2	000441	14/57	14/60	15/04	15/08	15/11	15/14
BEG3	000462	15/23	15/26				
BEG4	000471	15/30					
BEG5	000502	15/32	15/41	15/44			
BEG6	000510	15/47	15/50	15/54			
BGN7A	000202	12/29	12/31				
BMASK	000061	11/37	28/30	29/49	30/20	30/50	31/18
		32/15	32/43	33/12	33/44	34/15	34/47
		35/50	36/21	36/53	37/23		35/18
BOUND	007335	15/24	87/23				
BRFD	002634	37/55	38/38	39/17	39/55	40/35	40/53
BRFD1	002661	40/39	40/40	40/42	40/43	40/45	40/46
		40/57	40/60	41/03	41/08		40/49
BRFD2	002670	41/04	41/06				
BRFDS	002675	40/58	41/04	41/09			
BSET	001553	28/03	28/17	85/04			
BSRET	001567	28/03	28/14	28/15			
B. EG1	000400	14/29					
C0	000242	13/10	55/40	74/26	76/24		
C000	003015	40/20	43/03	43/32			
C001	003051	43/35					
C002	003065	44/01					
C004	003107	44/22					
C005	003123	44/37					
C006	003140	44/54	85/05				
C007	003254	46/33					
C007A	003300	47/01					
C008	003330	47/33					
C009	003354	48/01					
C010	003404	48/32					
C011	003433	49/03					
C012	003461	49/31					
C013	003502	49/54					
C016	003535	50/30					
C017	003562	50/56					
C018	003612	51/25					
C019	003641	51/51					
C020	003670	52/21					
C021	003717	52/48					
C022	003747	53/15					
C023	003774	53/38					
C024	004022	54/01					
C025	004051	54/28					
C026	004076	54/53					
C027	004125	55/21					
C028	004154	55/50					
C029	004203	56/19					
C030	004232	56/48					
C031	004261	57/17					
C032	004310	57/46					
C033	004337	58/15					

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C034	004366	58/44						
C035	004415	59/13						
C037	004444	59/43						
C038	004472	60/08						
C039	004523	60/40						
C040	004552	61/10						
C041	004601	61/39						
C042	004630	62/09						
C043	004657	62/39						
C044	004706	63/08						
C045	004735	63/37						
C046	004764	64/06						
C047	005013	64/36						
C048	005042	65/05						
C049	005071	65/34						
C050	005120	66/04						
C051	005147	66/30						
C052	005177	67/01						
C053	005227	67/32						
C054	005257	68/02						
C055	005307	68/32						
C056	005337	69/03						
C057	005367	69/34						
C058	005417	70/04						
C059	005447	70/35						
C059A	005477	71/08						
C060	005504	71/12	71/15					
C060A	005534	71/45						
C061	005567	72/19						
C062	005622	72/53						
C063	005655	73/27						
C064	005710	74/03						
C066	005743	74/37						
C067	006006	75/16						
C06A	003221	45/57						
C06B	003172	45/32						
C070	006051	75/55						
C071	006121	76/38						
C071A	006251	78/21						
C071B	006204	77/38						
C071C	006261	78/28	78/30					
C072	006317	80/01						
C073	006361	80/38						
C074	006416	81/11						
C075	006452	81/42						
C076	006503	82/10						
C077	006532	82/36						
C078	006561	83/02						
C079	006637	83/53						
C08R	007116	38/13	87/12					
C1	000243	13/11	56/09					
C10	000263	13/27	31/20	57/36	67/56	68/26	68/56	69/27
		69/58	70/28	70/59	74/31	76/29	81/38	
C100	000311	13/49	20/07	20/27	44/12	59/03	75/50	88/12
C1002	000326	14/02	38/34					
C1004	000327	14/03	39/13					
C1006	000330	14/04	39/51					
C100K	000325	14/01	37/51					

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C1070	011057	92/12						
C11	000264	13/28	24/29					
C12	000265	13/29	31/48					
C125	000312	13/50	60/59	61/58	62/28			
C12.	000251	13/17						
C14	000266	13/30	32/17					
C14.	000252	13/18	49/48					
C16	000267	13/31	32/45					
C17	000270	13/32						
C177	000313	13/51	64/25	65/24	67/20	68/21	68/51	72/42
		73/16						
C1BR	007131	38/56	87/13					
C1B76	012127	92/15						
C2	000244	13/12	29/51	56/38	84/34	88/31	88/44	
C20	000271	13/33	17/40	33/14	41/43	58/05		
C200	000314	13/52	21/38	22/13	25/24	29/12	37/49	38/32
		39/11	39/49	43/24	44/16	44/30	44/45	59/32
C21	000272	13/34						
C22	000273	13/35	33/46					
C22.	000253	13/19	49/25					
C23.	000254	13/20						
C24	000274	13/36	34/17					
C25	000275	13/37	63/27					
C250	000315	13/53						
C252	000316	13/54	60/29	61/29				
C26	000276	13/38	34/49					
C26.	000255	13/21	46/11					
C277	000317	13/55						
C28.	000256	13/22						
C2BR	007144	39/35	87/14					
C3	000245	13/13	47/25					
C30	000277	13/39	35/20					
C300	000320	13/56	75/11					
C31	000300	13/40	53/26					
C31.	000260	13/24	45/11	45/45	46/43	47/11	47/43	48/16
		48/46	50/14					
C32	000301	13/41	35/52					
C32.	000257	13/23	29/38	30/09	30/39	31/07	31/35	32/04
		32/32	33/01	33/33	34/04	34/36	35/07	35/39
		36/10	36/42	37/12	45/21	45/51	46/21	46/53
		47/21	47/53	48/26	48/56	49/20	49/43	50/24
C33.	000261	13/25						
C34	000302	13/42	36/23					
C34.	000262	13/26	29/15					
C36	000303	13/43	36/55	84/25				
C367	000321	13/57						
C37	000304	13/44	44/49	53/33	70/23	70/54	85/14	
C376	000322	13/58	54/46					
C377	000323	13/59	52/10	52/39	53/06	53/29	53/52	54/21
		60/01	63/56	64/55	65/53	66/22	66/49	67/51
		71/37	72/08	73/50	80/19	84/13		
C3BR	007157	40/13	87/15					
C4	000246	13/14	30/22	37/53	38/36	39/15	39/53	57/07
		66/54	67/25	72/13	72/47	73/21	73/55	
C40	000305	13/45	45/41	58/34				
C400	000324	13/60	43/08					
C5	000247	13/15	46/26					
C52	000306	13/46	62/58					

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C6	000250	13/16	30/52					
C76	000307	13/47	15/09	15/51	25/01			
C77	000310	13/48	69/22	69/53				
CAC?0	010444	92/12						
CAR?0	011765	92/15						
CB71	006117	76/03	76/05	76/07	76/09	76/36		
CB73	006415	80/58	81/10	81/31				
CD.2	010143	88/41	88/50					
CD.3	010142	88/17	88/49	88/55				
CHR?3	010457	92/12						
CHC?T	010445	92/12						
CHX?X	010463	92/12						
CHR?E	010443	92/12						
CHR?Z	010572	92/12						
CL0	000000	11/29	50/46	51/12	51/41	52/08	52/37	53/04
		54/19	54/44	55/09	55/38	56/07	56/36	57/05
		57/34	58/03	58/32	59/01	59/30	59/59	61/55
		62/25	62/55	63/24	63/53	64/22	64/52	65/21
		65/50	66/20	66/46	67/17	67/48	68/18	68/48
		69/19	69/50	70/20	70/51	71/24	71/35	71/54
		72/05	72/28	72/39	73/02	73/13	73/36	73/47
		74/12	74/23	74/46	74/57	75/25	75/36	76/58
		77/04	77/48	77/57	78/42	80/17	80/56	81/29
		81/60	82/26	82/52	83/18	84/12		
CL1	000200	11/30	60/26					
CL2	000400	11/31	60/56					
CL3	000600	11/32	61/26					
CLK0	000072	11/49	14/37	37/30	37/60	38/11	76/01	
CLK1	000073	11/50	14/38	38/43	38/54	76/02		
CLK2	000074	11/51	14/39	39/23	39/33			
CLK3	000075	11/52	14/40	40/01	40/11			
CLOCK	030461	MC	7/42	29/14	29/37	30/08	30/38	31/06
			32/03	32/31	32/60	33/32	34/03	34/35
			35/38	36/09	36/41	37/11	45/10	45/20
			45/50	46/10	46/20	46/25	46/42	46/52
			47/20	47/24	47/42	47/52	48/15	48/25
			48/55	49/19	49/24	49/42	49/47	50/13
							50/13	50/23
CLR	007011	12/22	85/58					
CM1	000331	14/07	29/36					
CM10	000341	14/15	34/02					
CM11	000343	14/17	34/34					
CM128	000351	14/23	37/34					
CM12	000344	14/18	35/05					
CM13	000345	14/19	35/37					
CM14	000346	14/20	36/08					
CM15	000347	14/21	36/40					
CM16	000350	14/22	37/10					
CM2	000332	14/08	16/17	30/07				
CM256	000352	14/24	28/05	28/10				
CM3	000333	14/09	30/37					
CM4	000334	14/10	31/05	43/06	85/44			
CM5	000335	14/11	31/33					
CM512	000353	14/25	85/59					
CM6	000336	14/12	32/02					
CM7	000337	14/13	28/51	32/30				
CM8	000340	14/14	32/59					
CM9	000342	14/16	33/31					
CODE5	000000	11/23	63/24	70/20	70/51			

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CODE6 000010	11/24	62/55	69/19	69/50	74/57	75/36	
CODE7 000020	11/25	62/25	68/18	68/48	71/24	71/54	73/02
	74/12						
CODE8 000030	11/26	50/46	51/12	51/41	52/08	52/37	53/04
	54/19	54/44	55/09	55/38	56/07	56/36	57/05
	57/34	58/03	58/32	59/01	59/30	59/59	60/26
	60/56	61/26	61/55	63/53	64/22	64/52	65/21
	65/50	66/20	66/46	67/17	67/48	71/35	72/05
	72/28	72/39	73/13	73/36	73/47	74/23	74/46
	75/25	76/58	77/04	77/48	77/57	78/42	80/17
	80/56	81/29	81/60	82/26	82/52	83/18	84/12
CONT 006764	12/12	85/36					
CRL?F 010467	12/45	92/12					
CTS 007022	13/09	86/12					
CTSM 007443	86/20	87/26					
CYC?2 011716	92/15						
CYC?I 011657	92/15						
CYC?J 011641	12/54	92/15					
CYC?X 011632	12/56	92/15					
DATA6 030642 MC	9/01	60/27	60/57	61/27	61/56	62/26	62/56
	63/25	63/54	64/23	64/53	65/22	65/51	
DATA0 030775 MC	9/51	51/51	55/21	55/50	56/19	56/48	57/17
	57/46	58/15	58/44	59/13			
DCG0A 010126	88/29	88/34					
DCHNG 010327	12/14	91/13					
DCH.1 010373	91/16	91/49					
DCH.2 010367	91/25	91/45					
DCH.3 010362	91/30	91/34	91/40				
DCH.4 010344	91/26	91/43					
DCH.5 010372	91/15	91/38	91/41	91/45	91/48		
DCH.6 010374	91/21	91/35	91/44	91/50			
DCIL1 010150	88/57	89/02	89/04				
DCL00 010106	88/16	88/23	88/27				
DCODE 000103	11/58	15/57	16/04				
DCO?T 010534	92/12						
DCRES 010240	12/24	90/01					
DCUBF 010001	88/06	88/16	88/54				
DCUEB 007231	87/18	90/51					
DCUGO 010162	88/34	89/09	89/12				
DCUIJ 010144	88/50	88/52					
DCUIN 010131	88/11	88/40					
DCUIO 010174	89/08	89/21					
DCUL 000114	12/07						
DCUMV 010127	88/25	88/36					
DCURT 007076	25/11	87/11					
DCUNT 010136	88/37	88/45					
DC.ST 010102	15/39	15/58	16/06	88/11	88/50		
DEC?T 010535	92/12						
DEL 006773	12/15	12/17	85/44	85/60			
DELI 006771	12/16	85/42					
DET?B 010575	92/12						
DEVCD 000101	11/56	15/17	15/21	17/44	23/36	23/56	
DIAG 031051 MC	10/09	29/11	37/48	38/31	39/10	39/48	44/29
	44/44						
DIRT 012203	14/33	92/21					
DIY? 011726	92/15						
DIY?0 011727	92/15						
DIY?D 011732	92/15						

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DLP	006717	40/22	84/30	84/49				
DLP1	006727	84/50	84/58					
DLPM	006732	84/49	84/54	85/02				
DLPR0	006733	84/53	85/03					
DST	010000	88/05	88/13	88/26				
DT0?S	000200	11/05	12/29					
DXA0	010172	89/19	89/22	89/24	90/05	90/08	90/17	90/20
		90/29						
DXA3	010173	89/20	89/25	89/33	89/38	89/39	90/42	
D?IAG	025076	MC	92/15					
EGGS	012175	11/12	12/41	92/15				
ENALT	006230	13/08	17/07	17/14	17/21	17/33	17/54	18/08
		18/18	18/26	18/34	18/47	19/03	19/17	19/31
		19/45	19/59	20/17	20/37	20/45	21/02	21/23
		21/42	21/59	22/18	22/37	22/56	23/16	23/38
		23/58	24/32	25/04	25/12	25/27	25/40	25/51
		26/02	26/18	26/36	26/46	26/60	27/16	28/34
		28/55	29/24	29/54	30/26	30/55	31/23	31/51
		32/20	32/48	33/17	33/49	34/20	34/52	35/23
		35/55	36/26	36/58	37/26	37/56	38/05	38/39
		38/48	39/18	39/27	39/56	40/05	43/29	43/47
		44/19	44/34	44/51	45/55	46/30	46/58	47/31
		47/58	48/30	48/60	49/29	49/51	50/28	50/52
		51/21	51/49	52/16	52/45	53/13	53/35	53/57
		54/25	54/50	55/15	55/46	56/15	56/44	57/13
		57/42	58/11	58/40	59/09	59/38	60/06	60/35
		61/05	61/35	62/04	62/34	63/04	63/33	64/02
		64/31	65/01	65/30	65/59	66/28	66/56	67/27
		67/58	68/28	68/58	69/29	69/60	70/30	71/01
		71/41	72/15	72/49	73/23	73/57	74/33	75/14
		75/53	76/31	77/36	78/15	78/60	80/36	81/06
		81/40	82/08	82/32	82/58	83/51	84/23	
ENDC	006671	84/25						
ENT?R	011612	12/53	92/15					
ERR?1	012073	92/15						
ERR?2	012064	92/15						
ERR?3	012113	92/15						
ERR?4	000211	12/39	89/15	92/15				
ERR?5	012122	92/15						
ERR?6	012026	92/15						
ERR?A	012045	92/15						
ERR?I	012013	92/15						
ERR?J	011775	12/55	92/15					
ERR?N	012071	92/15						
ERT?N	011767	92/15						
EVENP	000004	11/22	64/22	65/50	67/17	72/39	73/02	73/36
FDCUE	010311	89/37	90/50					
FST?D	010752	92/12						
HDCR	010315	89/54	89/60	90/57	91/03			
HDIN	010301	89/50	90/40	90/48				
HDIN0	010252	15/59	89/51	90/14	90/41	90/47		
HDLPT	010267	89/53	90/29					
HDSEI	010205	89/29	89/33					
HDTTO	010257	89/52	90/20					
HEA?D	012130	92/15						
HEL?P	000201	12/30	92/15					
HEXIT	010247	90/10	90/18	90/27	90/38	90/43		
HMON	010201	88/33	89/28	89/30	90/12			

0101 PTID

I12?1 011347	92/12	92/14					
ICONT 000117	12/12	29/16	29/39	30/10	30/40	31/08	31/36
	32/05	32/33	33/02	33/34	34/05	34/37	35/08
	35/40	36/11	36/43	37/13	37/54	38/37	39/16
	39/54	45/12	45/22	45/46	45/52	46/12	46/22
	46/27	46/44	46/54	47/12	47/22	47/26	47/44
	47/54	48/17	48/27	48/47	48/57	49/21	49/26
	49/44	49/49	50/15	50/25			
ICRL? 000216	12/45	92/12	92/14	92/15			
ICTS 000241	13/09	45/28					
ICVC? 000227	12/54	33/19	33/51	34/22	34/54	35/25	35/57
	36/28	36/60	37/58	38/07	38/16	38/41	38/50
	38/59	39/20	39/29	39/38	39/58	40/07	40/16
	52/18	55/48	56/17	56/46	57/15	57/44	58/13
	58/42	59/11	59/40	60/37	61/07	61/37	62/06
	62/36	63/06	63/35	64/04	64/33	65/03	65/32
	66/01	66/58	67/29	67/60	68/30	68/60	69/31
	70/02	70/32	71/03	72/17	72/51	73/25	73/59
	74/35	76/33	92/15				
ICV?C 000231	12/56	13/07					
IDCHN 000121	12/14	15/16	15/56				
IDCRS 000133	12/24	89/07					
IDEL 000122	12/15	51/16	75/01	75/40	78/49	80/21	
IDEL1 000124	12/17	28/52					
IDELA 000120	12/13	20/54	21/12	21/31	21/49	22/06	22/26
	22/45	23/05	23/25	23/45	24/19	24/45	25/17
	25/33	25/47	25/56	26/08	26/24	26/42	26/52
	27/06	28/22	28/43	29/04	29/31	30/02	30/32
	30/60	31/28	31/57	32/25	32/54	33/26	33/57
	34/29	34/60	35/32	36/03	36/35	37/05	37/44
	38/27	39/06	39/44	43/10	43/38	44/04	44/25
	44/40	44/57	44/59	45/35	45/60	46/36	47/04
	47/36	48/04	48/35	49/06	49/34	49/57	50/33
	50/59	51/28	51/55	52/24	52/51	53/18	53/41
	54/04	54/06	54/31	54/56	55/25	55/54	56/23
	56/52	57/21	57/50	58/19	58/48	59/17	59/46
	60/11	60/13	60/43	61/13	61/42	62/12	62/42
	63/11	63/40	64/09	64/39	65/08	65/37	66/07
	66/33	67/04	67/35	68/05	68/35	69/06	69/37
	70/07	70/38	71/18	71/48	72/22	72/56	73/30
	74/06	74/40	75/19	75/58	76/41	77/41	78/33
	80/04	80/43	81/16	81/47	82/13	82/39	83/05
	83/56						
IDELI 000123	12/16	20/43	50/50	51/19	53/31	53/54	54/23
	54/48	55/13	60/03	71/39	77/31	78/09	78/56
	80/29	80/41	81/14	81/45	82/30	82/56	83/29
IEGG? 000212	12/41	92/15					
IENT? 000226	12/53	17/03	17/10	17/17	17/26	17/37	17/60
	18/12	18/21	18/29	18/37	18/53	19/06	19/20
	19/34	19/48	20/03	20/23	20/40	20/50	21/06
	21/28	21/46	22/03	22/20	22/40	22/59	23/20
	23/40	24/11	24/38	25/14	25/30	25/44	25/53
	26/05	26/21	26/38	26/49	27/03	28/19	28/40
	29/01	29/28	29/59	30/29	30/57	31/25	31/54
	32/22	32/51	33/23	33/54	34/26	34/57	35/29
	35/60	36/32	37/02	37/41	38/24	39/03	39/41
	43/03	43/35	44/01	44/22	44/37	44/54	45/32
	45/57	46/33	47/01	47/33	48/01	48/32	49/03

0102 PTID

	49/31	49/54	50/30	50/56	51/25	51/52	52/21
	52/48	53/15	53/38	54/01	54/28	54/53	55/22
	55/51	56/20	56/49	57/18	57/47	58/16	58/45
	59/14	59/43	60/08	60/40	61/10	61/39	62/09
	62/39	63/08	63/37	64/06	64/36	65/05	65/34
	66/04	66/30	67/01	67/32	68/02	68/32	69/03
	69/34	70/04	70/35	71/15	71/45	72/19	72/53
	73/27	74/03	74/37	75/16	75/55	76/38	77/38
	78/30	80/01	80/38	81/11	81/42	82/10	82/36
	83/02	83/53					
IERR? 000230	12/55	13/08	86/25				
IINP? 000214	12/43	91/02	92/15				
IINR? 011400	92/14						
IMES? 000215	12/44	14/32	14/45	14/54	15/04	15/23	15/41
	15/47	25/10	38/12	38/55	39/34	40/12	84/55
	86/19	90/50	91/55	92/03	92/14	92/15	
IN0? 011147	92/12						
IN1? 011234	92/12						
IN1?0 011130	92/12						
IN1?2 011351	92/12	92/14					
IN1?3 011127	92/12						
IN1?5 011352	92/12	92/14					
IN2? 011241	92/12						
IN3? 011116	92/12						
IN3?3 011126	92/12						
IN4? 011302	92/12						
IN5? 011166	92/12						
IN6? 011202	92/12						
IN6?0 011350	92/12	92/14					
INB?A 011344	92/12	92/14					
INB?I 011345	92/12	92/14					
INL?K 011132	92/12						
INM? 011256	92/12						
INPDS 007417	14/46	87/25					
INP?I 011134	92/12						
INP?I 011137	92/12						
INP?J 011142	92/12						
INP?K 011572	12/43	92/14					
INP?0 011334	92/12	92/14					
INP?R 011342	92/12	92/14					
INR? 011204	92/12	92/14					
INR?I 011603	92/14						
INR?K 011602	92/14						
INR?0 011604	92/14						
INS? 011346	92/12						
INS?0 011336	92/12						
INS?I 011337	92/12						
INS?2 011340	92/12						
INS?3 011341	92/12	92/14					
INS?A 011335	92/12	92/14					
INS?V 011316	92/12	92/14					
INS?X 011377	92/14						
INT? 011022	92/12						
INT?E 011131	92/12						
IN?PR 011133	92/12						
I0DT? 000233	12/59	86/45	92/14				
I0M?0 000235	13/03	24/07	89/10	89/32	89/40	90/01	90/06
	90/45	90/57	91/04	92/12	92/15		

0103 PTID

IPDC? 000221	12/48	92/12	92/14	92/15			
IPDE? 000220	12/47	40/27	92/02	92/10			
IPOC? 000222	12/49	92/14	92/15				
IPSD1 000240	13/06	92/14					
ISUBX 000125	12/18	28/07	28/12				
ISUBY 000126	12/19	28/06					
ISUBZ 000127	12/20	28/11					
ISWR? 000213	12/42	86/53	92/12	92/15			
ITI?D 000225	12/52	87/06					
ITI?O 000224	12/51	86/36					
ITPS? 000232	12/57	92/12	92/14				
ITR? 011761	92/15						
ITR?C 011763	92/15						
ITR?R 000206	12/36	25/07	92/15				
ITR?T 011762	92/15						
ITTD 000236	13/04	15/25					
ITTI 000237	13/05	14/47	14/56	15/07	15/43	15/49	
ITYP? 000217	12/46	92/12					
IZOC? 000223	12/50	92/14	92/15				
K1031 004021	53/49	53/60					
K10?0 011770	92/15						
K12? 010476	92/12						
K15? 010477	92/12						
K400 000063	11/39	20/59	21/18	21/36	21/54	22/11	22/32
	22/51	23/11	23/31	23/51	24/24	24/50	25/22
	25/37	25/57	26/13	26/29	26/57	27/11	28/27
	28/48	29/09	29/21	29/46	30/17	30/47	31/15
	31/43	32/12	32/40	33/09	33/41	34/12	34/44
	35/15	35/47	36/18	36/50	37/20	43/15	43/43
	44/09						
KB140 006531	82/28	82/35					
KB26 004124	55/11	55/18					
KB400 006560	82/54	83/01					
KCALL 010204	89/32	89/35					
KM200 000354	14/26	21/10	23/03	23/23	23/43		
KM201 001304	24/02	24/17					
KM420 001305	24/03	24/43					
LCS 030547 MC	8/26	50/44	51/10	51/39	52/06	52/35	53/02
	54/17	54/42	55/07	55/36	56/05	56/34	57/03
	57/32	58/01	58/30	58/59	59/28	59/57	60/24
	60/54	61/24	61/53	62/23	62/53	63/22	63/51
	64/20	64/50	65/19	65/48	66/18	66/44	67/15
	67/46	68/16	68/46	69/17	69/48	70/18	70/49
	71/22	71/33	71/52	72/03	72/26	72/37	72/60
	73/11	73/34	73/45	74/10	74/21	74/44	74/55
	75/23	75/34	76/56	77/02	77/46	77/55	78/40
	80/15	80/54	81/27	81/58	82/24	82/50	83/16
	84/10						
LINCH 006737	12/10	85/09					
LINE 030517 MC	8/03	29/32	30/03	30/33	31/01	31/29	31/58
	32/26	32/55	33/27	33/58	34/30	35/01	35/33
	36/04	36/36	37/06				
LON 000064	11/40	53/24	53/47				
LOOP 007047 MC	33/18	33/50	34/21	34/53	35/24	35/56	36/27
	36/59	37/57	38/06	38/15	38/40	38/49	38/58
	39/19	39/28	39/37	39/57	40/06	40/15	52/17
	55/47	56/16	56/45	57/14	57/43	58/12	58/41
	59/10	59/39	60/36	61/06	61/36	62/05	62/35

0104 PTID

	63/05	63/34	64/03	64/32	65/02	65/31	65/60
	66/57	67/28	67/59	68/29	68/59	69/30	70/01
	70/31	71/02	72/16	72/50	73/24	73/58	74/34
	76/32						
LOOPB 000001	11/19	50/46	51/12	51/41	52/08	52/37	53/04
	54/19	54/44	55/09	55/38	56/07	56/36	57/05
	57/34	58/03	58/32	59/01	59/30	60/26	60/56
	61/26	61/55	62/25	62/55	63/24	63/53	64/22
	64/52	65/21	65/50	66/20	66/46	67/17	67/48
	68/18	68/48	69/19	69/50	70/20	70/51	76/58
	77/04	77/48	77/57	80/17	80/56	81/29	81/60
	82/26	82/52	83/18	84/12			
LOOPX 006231	13/07	17/08	17/15	17/22	17/34	17/58	18/10
	18/19	18/27	18/35	18/48	19/04	19/18	19/32
	19/46	19/60	20/18	20/38	20/46	21/03	21/25
	21/43	21/60	22/19	22/38	22/58	23/18	23/39
	23/59	24/33	25/05	25/13	25/28	25/41	25/52
	26/03	26/19	26/37	26/47	27/01	27/17	28/35
	28/56	29/25	29/55	30/27	30/56	31/24	31/52
	32/21	32/49	37/27	43/33	43/48	44/20	44/35
	44/52	45/29	45/56	46/31	46/59	47/32	47/59
	48/31	49/01	49/30	49/52	50/29	50/53	51/22
	51/50	52/46	53/14	53/36	53/58	54/26	54/51
	55/16	60/07	66/29	71/42	75/15	75/54	77/37
	78/16	79/02	80/37	81/07	81/41	82/09	82/33
	82/59	83/52	84/24				
LOO?R 011760	92/15						
LOO?T 012150	92/15						
LOP?E 011764	92/15						
L?OOP 004646 MC	33/19	33/51	34/22	34/54	35/25	35/57	36/28
	36/60	37/58	38/07	38/16	38/41	38/50	38/59
	39/20	39/29	39/38	39/58	40/07	40/16	52/18
	55/48	56/17	56/46	57/15	57/44	58/13	58/42
	59/11	59/40	60/37	61/07	61/37	62/06	62/36
	63/06	63/35	64/04	64/33	65/03	65/32	66/01
	66/58	67/29	67/60	68/30	68/60	69/31	70/02
	70/32	71/03	72/17	72/51	73/25	73/59	74/35
	76/33						
MARK 006103	76/10	76/21					
MCODE 007172	15/05	87/16					
MDCU 007301	15/48	87/21					
MDCUX 007245	15/42	87/19					
MDV?1 011771	92/15						
MDV?2 011735	92/15						
MDV?3 011744	92/15						
MDV?4 011751	92/15						
MDV?5 011766	92/15						
MES?M 010426	92/12						
MES?S 010420	12/44	92/12					
MKLIN 006742	84/39	84/42	85/14				
MUL? 011746	12/11	92/15					
MUL?A 011747	92/15						
NCONS 003014	41/23	41/34	42/30				
NIOPT 010224	89/43	89/49					
NLINE 000102	11/57	15/31					
NOL00 000000	11/18	59/59	71/24	71/35	71/54	72/05	72/28
	72/39	73/02	73/13	73/36	73/47	74/12	74/23
	74/46	74/57	75/25	75/36	78/42		

0105 PTID

NOPAR 000000	11/20	50/46	51/12	51/41	52/08	52/37	53/04
	54/19	54/44	55/09	55/38	56/07	56/36	57/05
	57/34	58/03	58/32	59/01	59/30	59/59	60/26
	60/56	61/26	61/55	62/25	62/55	63/24	66/20
	67/48	68/18	68/48	69/19	69/50	70/20	70/51
	71/35	72/05	73/13	74/12	74/23	74/46	74/57
	75/25	75/36	76/58	77/04	77/48	77/57	78/42
	80/17	80/56	81/29	81/60	82/26	82/52	83/18
	84/12						
010?1 011354	92/14						
001?2 011351	92/14						
001?5 011352	92/14						
006?0 011350	92/14						
007?7 011556	92/14						
00A?7 011355	92/14						
00A?C 011353	92/14						
00A?L 011500	92/14						
00B?E 011541	92/14						
00B?P 011420	92/14						
00DPA 000002	11/21	63/53	64/52	65/21	66/46	71/24	71/54
	72/28	73/47					
00D?B 011415	92/14						
00D?R 011522	92/14						
00D?T 011562	92/14						
00E?1 011545	92/14						
00E?2 011547	92/14						
00E?4 011554	92/14						
00E?0 011560	92/14						
00I?N 011565	92/14						
00I?T 011557	92/14						
00L?C 011466	92/14						
00L?T 011564	92/14						
00O?C 011506	92/14						
00O?F 011563	92/14						
00O?K 000210	12/38	92/14					
00P?C 011364	92/14						
00R?T 011365	92/14						
00T?1 011411	92/14						
00T?2 011434	92/14						
00T?3 011570	92/14						
00T?I 011401	92/14						
00T?J 011404	12/59	92/14					
00T?K 011605	92/14						
00T?P 011567	92/14						
00U?A 011561	92/14						
00W?T 011437	92/14						
ONEST 000000	11/27	50/46	51/12	51/41	52/08	52/37	53/04
	54/19	54/44	55/09	55/38	56/07	56/36	57/05
	57/34	58/03	58/32	59/01	59/30	59/59	60/26
	60/56	61/26	62/25	62/55	63/24	63/53	64/22
	65/21	65/50	66/20	66/46	67/17	68/18	69/19
	70/20	71/24	71/35	71/54	72/05	72/28	72/39
	73/02	73/13	73/36	73/47	74/12	74/23	74/46
	75/25	75/36	76/58	77/04	77/48	77/57	78/42
	80/17	80/56	81/29	81/60	82/26	82/52	83/18
	84/12						
OUADR 000105	11/60	14/35	15/29	16/11	44/60	45/36	46/01
	47/27	48/05	48/36	49/07	49/59	50/35	51/01

0106 PTID

	51/30	51/57	52/26	52/53	53/20	53/43	54/08
	54/33	54/58	55/27	55/56	56/25	56/54	57/23
	57/52	58/21	58/50	59/19	59/48	60/15	60/45
	61/15	61/44	62/14	62/44	63/13	63/42	64/11
	64/41	65/10	65/39	66/09	66/35	67/06	67/37
	68/07	68/37	69/08	69/39	70/09	70/40	71/08
	71/27	71/57	72/31	73/05	73/39	74/15	74/49
	75/28	76/15	76/43	77/07	77/14	77/42	78/34
	78/44	80/06	80/45	81/18	81/49	82/15	82/41
	83/07	83/20	83/27	83/33	83/58	84/28	84/33
	84/40	84/59					
0?0TD 000527 MC	2/31	92/13					
0?0TP 022740 MC	92/13						
P1?7? 010753	92/12						
P3?7? 010441	92/12						
PAC?0 010570	92/12						
PAC?1 010715	92/12						
PAC?2 010571	92/12						
PAS?S 000203	12/32	84/51	92/15				
PA?C1 011061	92/12						
PA?C3 011060	92/12						
PA?SI 000204	12/33						
PA?SV 000205	12/34						
PBRD 006635	83/40	83/51					
PBRT 002630	38/14	38/57	39/36	40/14	40/26	40/28	
PC1?0 010574	92/12						
PC1?1 010442	92/12						
PC1?2 011053	92/12						
PC1?5 011054	92/12						
PC4?0 010724	92/12						
PC6?0 010573	92/12						
PC?? 010725	92/12						
PCR?Y 010567	92/12						
PDC?1 010527	92/12						
PDC?2 010525	92/12						
PDC?S 010512	12/48	92/12					
PDE?C 010522	12/47	92/12					
PLP?T 010652	92/12						
POC?T 010504	12/49	92/12					
PRIME 007221	87/17	91/56					
PRIML 000104	11/59	16/16	45/17	45/47	46/17	46/49	47/17
	47/49	48/22	48/52	49/16	49/39	50/20	84/41
	91/57						
PRS2 000076	11/53						
PRS3 000077	11/54						
PSD1 010376	13/06	91/54	92/11				
PSP? 010437	92/12						
P?G0U 024652 MC	12/25						
RB6?0 011115	92/12						
RBCO 007373	14/55	87/24					
RECAD 000106	12/01	16/14	71/20	71/50	72/24	72/58	73/32
	74/08	74/42	75/21	75/59	76/60	77/08	77/21
	77/52	78/21	84/38	84/43			
RECEI 030612 MC	8/46	49/58	50/34	50/60	51/29	51/56	52/25
	52/52	53/19	53/42	54/07	54/32	54/57	55/26
	55/55	56/24	56/53	57/22	57/51	58/20	58/49
	59/18	59/47	60/14	60/44	61/14	61/43	62/13
	62/43	63/12	63/41	64/10	64/40	65/09	65/38

0107 PTID

		66/08	66/34	67/05	67/36	68/06	68/36	69/07	
		69/38	70/08	70/39	76/42	80/05	80/44	81/17	
		81/48	82/14	82/40	83/06	83/57			
RECVI	030671	MC	9/13	71/19	71/49	72/23	72/57	73/31	74/07
			74/41	75/20	76/59				
RES?T	000234		12/60	86/48	86/54	89/13	92/12		
RICLR	030475	MC	7/53	19/37	19/51				
RST?R	010605		92/12						
RTN?A	010566		92/12						
RUB?	011101		92/12						
SAVET	002743		41/32	41/41	41/49				
SAV?E	010577		92/12						
SCAN	030744	MC	9/35	32/50	33/22	33/53	34/25	34/56	35/28
			35/59	36/31					
SDONE	030464	MC	7/47	20/55	21/14	21/32	21/50	22/07	22/28
			22/47	23/07	23/27	23/47	24/20	24/46	25/18
			26/09	26/25	26/53	27/07	28/23	28/44	29/05
			29/17	29/42	30/13	30/43	31/11	31/39	32/08
			32/36	33/05	33/37	34/08	34/40	35/11	35/43
			36/14	36/46	37/16	43/11	43/39	44/05	
SECLI	000107		12/02	16/18	84/44	92/05			
SECON	007323		87/22	92/04					
SMALL	002726		41/28	41/36					
SPACE	006072		76/06	76/12					
SPT?G	010440		92/12						
STATU	030710	MC	9/21	66/47	67/18	67/49	68/19	68/49	69/20
			69/51	70/21	70/52	72/06	72/40	73/14	73/48
			74/24	76/22					
STAT?T	011343		92/12						
STOP	002771		42/11	42/29					
STO?P	012163		92/15						
SUBX	006751		12/18	12/20	85/22				
SUBY	006752		12/19	85/23					
SWREG	012202		12/42	92/20					
S?WPD	000050	MC	2/30	92/12					
S?WPK	021330	MC	92/12						
TABLE	002751		41/21	41/24	41/30	41/33	41/36	41/42	41/45
			41/46	41/55					
TAC?0	010717		92/12						
TAC?C	010723		92/12						
TADD	002712		41/24	41/35					
TBAD	006247		78/15						
TCYCL	030574	MC	8/38	45/13	46/13	46/45	47/13	47/45	48/18
			48/48	49/12	49/35	50/16			
TEM	000100		11/55	15/15	15/20	17/41	17/55	43/09	43/17
TEMP	000110		12/03	15/55	16/03	38/01	38/44	39/22	39/60
			40/37	40/48	41/01	41/07	41/26	41/37	41/47
			41/49	41/53	43/07	43/31			
THING	000111		12/04						
TIM2	030557	MC	8/31	46/06					
TIM2A	030543	MC	8/18	49/46					
TIM2B	030545	MC	8/22	49/23					
TIM6	030530	MC	8/11	45/05	46/37	47/05	47/37	48/10	48/40
			50/08						
TIN?1	011055		92/12						
TIN?2	011056		92/12						
TIN?A	011062		92/12						
TIN?C	010726		92/12						

0108 PTID

TIN?D 010766	12/52	92/12						
TIN?M 011023	92/12							
TIN?N 011034	92/12							
TIN?O 010762	12/51	92/12						
TIN?Q 010771	92/12							
TIN?R 010731	92/12							
TIN?S 010776	92/12							
TIN?W 011002	92/12							
TIN?X 010730	92/12							
TIN?Z 010772	92/12							
TMP? 010576	92/12							
TOD?T 010754	92/12	92/14						
TO?DT 011571	92/14							
TPLUS 002752	41/55	41/56	42/28					
TPR?T 010672	92/12							
TPS?P 010613	12/57	92/12						
TP?? 011566	92/14							
TRANS 030625 MC	8/53	50/39	51/05	51/34	52/01	52/30	52/57	
	54/12	54/37	55/02	55/31	55/60	56/29	56/58	
	57/27	57/56	58/25	58/54	59/23	59/52	60/19	
	60/49	61/19	61/48	62/18	62/48	63/17	63/46	
	64/15	64/45	65/14	65/43	66/13	66/39	67/10	
	67/41	68/11	68/41	69/12	69/43	70/13	70/44	
	71/28	71/58	72/32	73/06	73/40	74/16	74/50	
	75/29	76/51	78/35	80/10	80/49	81/22	81/53	
	82/19	82/45	83/11	84/05				
TSI? 010733	92/12							
TTCO 007066	86/49	86/59						
TTCO 007064	86/43	86/57						
TTCR 007065	86/46	86/58						
TTID 007070	13/04	87/04						
TTII 007041	13/05	86/34	86/38	86/40	87/04	87/08		
TTIII 007050	86/37	86/43	87/07					
TTII2 007046	86/39	87/09						
TTS2 007067	86/35	86/39	86/60	87/05				
TTY? 010635	92/12							
TWOST 000040	11/28	61/55	64/52	67/48	68/48	69/50	70/51	
	74/57							
TXTPS 007273	84/56	87/20						
TYP?E 010616	12/46	92/12						
TYP?R 010722	92/12							
T?TY0 016366 MC	92/12							
WATE 000112	12/05	38/20	85/42					
WHAT 000401	12/23	14/30	14/42					
WTBSY 007014	12/13	86/03						
XA031 001313	24/09							
XXX 007021	15/19	86/09						
YES 000113	12/06	15/34	16/02	16/10	24/04			
YIOIN 010305	89/56	90/45						
YIOPT 010232	89/45	89/55						
YIOTH 010242	89/57	89/58	89/59	90/04				
ZBEG1 006736	84/60	85/06						
ZC006 006735	84/46	85/05						
ZOC?T 010500	12/50	92/12						
ZPO?T 010507	92/12							
ZSU?P 010716	92/12							
.BS 006734	84/45	85/04						
.CLR 000131	12/22	50/47	51/13	51/42	52/09	52/38	53/05	

0109 PTID

	53/28	53/51	54/20	54/45	55/10	55/39	56/08
	56/37	57/06	57/35	58/04	58/33	59/02	59/31
	59/60	60/28	60/58	61/28	61/57	62/27	62/57
	63/26	63/55	64/24	64/54	65/23	65/52	66/21
	66/48	67/19	67/50	68/20	68/50	69/21	69/52
	70/22	70/53	71/36	72/07	72/41	73/15	73/49
	74/25	74/58	75/37	76/23	78/43	80/18	80/57
	81/30	82/01	82/27	82/53	83/19	84/15	
. LINC 000115	12/10	50/45	51/11	51/40	52/07	52/36	53/03
	54/18	54/43	55/08	55/37	56/06	56/35	57/04
	57/33	58/02	58/31	58/60	59/29	59/58	60/25
	60/55	61/25	61/54	62/24	62/54	63/23	63/52
	64/21	64/51	65/20	65/49	66/19	66/45	67/16
	67/47	68/17	68/47	69/18	69/49	70/19	70/50
	71/23	71/34	71/53	72/04	72/27	72/38	73/01
	73/12	73/35	73/46	74/11	74/22	74/45	74/56
	75/24	75/35	76/11	76/20	76/57	77/03	77/47
	77/56	78/41	80/16	80/55	81/28	81/59	82/25
	82/51	83/17	84/11				
. MUL 000116	12/11						
. SKIP 000062	11/38	17/49					
. STOP 003013	41/29	42/29					
. TPLU 003012	41/20	42/28					
. WHAT 000132	12/23	16/01	16/08				
?F 000000	12/29						
?G 000001	12/29						

```

01 ;
02 ;
03 ;
04 ;
05 ;
06 ;*****
07 ;
08 ;
09 ; DESCRIPTION: PROGRAMMABLE TERMINAL INTERFACE (PTI) XMIT/ECHO PROGRAM
10 ;
11 ;
12 ; CUSTOM SYSTEMS INC, 1981
13 ;*****

```

```

15 000001 .TITL PTIE
        .DUSR X=1

```

```

16 ;1 PROGRAM NAME PTIE.SR
17 ;

```

```

18 ;2 REVISION HISTORY
19 ;

```

```

20 ; REV. DATE
21 ; 00 09/17/81
22 ;

```

- ```

23 ;3 MACHINE REQUIREMENTS:
24 ;3.1 NOVA/ECLIPSE FAMILY PROCESSOR
25 ;3.2 16K READ/WRITE MEMORY
26 ;3.3 CONSOLE DEVICE
27 ;3.4 PROGRAMMABLE TERMINAL INTERFACE (PTI)
28 ;3.5 CRT TERMINAL AND CABLE

```

```

29 ;
30 ;4 SUMMARY
31 ; THIS PROGRAM IS INTENDED FOR USE WITH THE 16 CHANNEL PTI BOARD TO AID
32 ; TESTING OF CURRENT LOOP PORTIONS OF THE BOARD. TO TEST ANY OF THE LINES,
33 ; ATTACH TERMINAL TO THAT LINE, LOAD PROGRAM, SET PARAMETERS TO SELECT THAT
34 ; LINE WHEN PROGRAM ASKS.
35 ; NOTE: (TERMINAL MUST BE SET TO LINCHR)
36 ;

```

- ```

37 ;5 RESTART PROCEDURE
38 ;5.1 THE PROGRAM MAY BE RESTARTED AT 200 FOR REPEAT EXECUTION. THIS
39 ; MAY BE DONE MANUALLY OR VIA ^ R.
40 ;5.2 THE LINE SELECTION MAY BE CHANGED DIRECTLY VIA ^ L.
41 ;5.3 THE XMIT/ECHO FUNCTION MAY BE CHANGED DIRECTLY VIA ^ E.
42 ;5.4 THE XMIT DATA MAY BE CHANGED DIRECTLY VIA ^ D.

```

```

0002 PTIE
01 000001 .NOMAC X
02 000000 .LOC 0
03 00000 000002 2
04 00001 000010 10
05 00002 000200 DTO?S
06 00003 002002 JMP @ -1
07 000010 .LOC 10
08 00010 002000 JMP @0 ; INTERRUPT RTN
09
10 000045 .LOC 45
11 00045 002563 EGGS
12
13 000034 .DUSR MUX=34
14 00046 000034 DEYCD: MUX
15 00047 000000 CHNG: 0
16 00050 000000 TEM: 0
17 ; ADDRESSES
18
19 00051 000737 IDCHNG: DCHNG
20 P?GOU BEGL K, J, L, 200, 70000, 1
21 00233 001771 IODT?: ODT?J
22 00234 000200 RES?T: JMP 200
23
24
25 00235 000000 IOM?O: 0
26 00236 000731 ITTD: TTID
27 00237 000662 ITTI: TTII
28 006231 LOOPX= JSR@ ICY?C ; DELAYED LOOP
29 006230 EHHLT=JSR@ IERR?
30 00240 000003 C3: 3
31 00241 000004 C4: 4
32 00242 000005 C5: 5
33 00243 000011 C9: 9
34 00244 000040 C40: 40
35 00245 000076 C76: 76
36 00246 100000 C100K: 100000
37 00247 177774 CM4: -4
38 00250 177767 CM9: -9
39 00251 177400 CM256: -256
40 00252 177000 CM512: -512
41 000400 .LOC 400
42
43 00400 000000 WHAT: 0
44 00401 062677 BEG1: IORST ; IN THE BEGINNING, RESET I/O
45 00402 102400 SUB 0, 0
46 00403 040047 STA 0, CHNG ; CONTROL D & L FLAG
47 00404 006215 JSR@ IMES?
48 00405 003022 DIRT ; NAME
49 00406 024772 LDA 1, WHAT
50 00407 125005 MOV 1, 1, SNR ; INPUT PARAMETERS ALREADY SET?
51 00410 000410 JMP BEG2 ; NO
52 00411 006215 JSR@ IMES? ; ASK IF DESIRED
53 00412 002633 INPDS ; TYPE 1 IF NEW PARAMETERS DESIRED
54 00413 006237 JSR@ ITTI ; GET CHAR
55 00414 000555 JMP BEG0 ; NOT 1
56 00415 102520 SUBZL 0, 0
57 00416 122404 SUB 1, 0, SZR ; NEW PARAMETERS IF A 1
58 00417 000552 JMP BEG0 ; NOT A 1 JUST RESTART
59 00420 006215 BEG2: JSR @IMES? ; *TYPE 2 DIGIT DEVICE CODE
60 00421 002571 MCODE ; OF PTI CONTROLLER

```

0003 PTIE

```

01                                     ; THEN CARRIAGE RETURN"
02 00422 006237   JSR@   ITTI
03 00423 000775   JMP    BEG2   ;ERROR!
04 00424 030245   LDA    2,C76
05 00425 121005   MOV    1,0,SNR
06 00426 000772   JMP    BEG2
07 00427 125213   MOVR# 1,1,SNR
08 00430 146432   SUBZ# 2,1,SCZ   ;0<CODE<76 ALLOWED
09 00431 000767   JMP    BEG2
10 00432 040050   STA    0,TEM    ;MUST BE EVEN #
11 00433 006051   JSR    @IDCHNG  ;CHANGE DEVICE CODE
12 00434 000046   DEVCD
13 00435 000573   START    ;FIRST LOCATION TO BE CHANGED
14 00436 000660   XXX      ;LAST LOCATION TO BE CHANGED
15 00437 020050   LDA    0,TEM
16 00440 040046   STA    0,DEVCD  ;C(DEVCD) HOLDS PRIME CODE
17
18 00441 006215 BEG3: JSR    @IMES?  ;"TYPE ADDRESS OF LINE
19 00442 002656   WLINE    ;(IN DECIMAL)="
20 00443 006236   JSR    @ITTD   ;INPUT ADDRESS
21 00444 000775   JMP    BEG3    ;INPUT ERROR
22 00445 020251   LDA    0,CM256 ;<256. NOT ALLOWED
23 00446 107414   AND#    0,1,SCZ
24 00447 000772   JMP    BEG3
25 00450 125120   MOVZL   1,1
26 00451 044374   STA    1,BDADR ;SAVE IT
27 00452 020047   LDA    0,CHNG
28 00453 101004   MOV    0,0,SCZ ;GOT HERE WITH ^ L
29 00454 000515   JMP    BEG0    ;DON'T FINISH
30 00455 006215 BEG4: JSR    @IMES?  ;"XMIT OR ECHO MODE?"
31 00456 002701   XMTREC
32 00457 006236   JSR    @ITTD
33 00460 000775   JMP    BEG4    ;INPUT ERROR
34 00461 125234   MOVR#   1,1,SCZ ;1 OR LESS
35 00462 000773   JMP    BEG4    ;1 OR 0 ONLY
36 00463 125005   MOV    1,1,SNR
37 00464 000412   JMP    BEG5-3
38 00465 010374   ISZ    BDADR   ;1. WAS A XMIT
39 00466 020047   LDA    0,CHNG
40 00467 101004   MOV    0,0,SCZ ;GOT HERE WITH ^ E
41 00470 000501   JMP    BEG0    ;DON'T FINISH
42 00471 006215 BEG4A: JSR    @IMES?  ;XMIT DATA IN OCTAL
43 00472 003006   ODATA
44 00473 006237   JSR    @ITTI
45 00474 000775   JMP    BEG4A
46 00475 044373   STA    1,XDATA ;SAVE XMIT DATA
47 00476 020047   LDA    0,CHNG
48 00477 101004   MOV    0,0,SCZ ;GOT HERE WITH CONTROL D
49 00500 000471   JMP    BEG0    ;DON'T FINISH
50 00501 006215 BEG5: JSR    @IMES?  ;"PARITY"
51 00502 002714   PARTY
52 00503 006236   JSR    @ITTD
53 00504 000775   JMP    BEG5    ;INPUT ERROR
54 00505 030240   LDA    2,C3
55 00506 146412   SUB#    2,1,SCZ ;>2 NOT ALLOWED
56 00507 000772   JMP    BEG5
57 00510 020246   LDA    0,C100K ;LINE CHARACTERISTIC
58 00511 125120   MOVZL   1,1
59 00512 123000   ADD    1,0      ;PARITY BITS 13 AND 14
60 00513 040372   STA    0,LINCHR

```


0004 PTIE

01	00514	006215	BEG6:	JSR	@IMES?		; 5, 6, 7, OR 8 BIT WORD
02	00515	002767		LWORD			
03	00516	006236		JSR	@ITTD		
04	00517	000775		JMP	BEG6		
05	00520	020243		LDA	0, C9.		
06	00521	106412		SUB#	0, 1, SZC		; MORE THAN 8
07	00522	000772		JMP	BEG6		
08	00523	020241		LDA	0, C4		
09	00524	122412		SUB#	1, 0, SZC		; LESS THAN 5
10	00525	000767		JMP	BEG6		
11	00526	020242		LDA	0, C5		
12	00527	106400		SUB	0, 1		
13	00530	125120		MOVZL	1, 1		
14	00531	125120		MOVZL	1, 1		
15	00532	125120		MOVZL	1, 1		
16	00533	020372		LDA	0, LINCHR		
17	00534	123000		ADD	1, 0		; WORD LENTH IN BITS 11 AND 12
18	00535	040372		STA	0, LINCHR		
19	00536	006215	BEG7:	JSR	@IMES?		; STOP BITS
20	00537	002734		STOPB			
21	00540	006236		JSR	@ITTD		
22	00541	000775		JMP	BEG7		
23	00542	125015		MOV#	1, 1, SNR		; >0
24	00543	000773		JMP	BEG7		
25	00544	125220		MOVZR	1, 1		
26	00545	125234		MOVZR#	1, 1, SZR		; >2
27	00546	000770		JMP	BEG7		
28	00547	125004		MOV	1, 1, SZR		
29	00550	024244		LDA	1, C40		
30	00551	020372		LDA	0, LINCHR		
31	00552	123000		ADD	1, 0		
32	00553	040372		STA	0, LINCHR		
33	00554	006215	BEG8:	JSR	@IMES?		; WHICH CLOCK
34	00555	002752		WCLK			
35	00556	006236		JSR	@ITTD		
36	00557	000775		JMP	BEG8		
37	00560	020247		LDA	0, CM4		
38	00561	107414		AND#	0, 1, SZR		; <4
39	00562	000772		JMP	BEG8		
40	00563	125300		MOVS	1, 1		
41	00564	125220		MOVZR	1, 1		; CLOCK SELECT IN BITS 7 AND 8
42	00565	020372		LDA	0, LINCHR		
43	00566	123000		ADD	1, 0		
44	00567	040372		STA	0, LINCHR		
45	00570	040610		STA	0, WHAT		
46	00571	002401	BEG0:	JMP	@ +1		
47	00572	000573		START			

0005 PTIE

```

01          ;MAIN PROGRAM STARTS HERE
02
03      000370      .LOC      370
04 00370 000200 MASK: 200
05 00371 177000 MCOUNT: 177000
06 00372 100220 LINCHR: 100220      ;NO LOOP, NO PARITY, 7 CODE, 1 STOP, CL1
07 00373 000000 XDATA: 0            ;XMIT DATA
08 00374 000000 BDADR: 0
09 00375 000000 QUADR: 0
10      000573      .LOC      BEG0+2
11 00573 020374 START: LDA      0, BDADR
12 00574 061034      DOA      0, MUX
13 00575 060134      NIOS     MUX
14 00576 063534      SKPBZ    MUX      ;INITIALIZE
15 00577 000777      JMP      .-1
16 00600 020374 XSTAR: LDA      0, BDADR      ;RE-ENTRY IF XMTR DONE RECEIVED
17 00601 040375      STA      0, QUADR
18 00602 063610 RSTAR: SKPDN    TTI      ;RE-ENTRY IF RCVR DONE
19 00603 000402      JMP      .+2
20 00604 006236      JSR      @ITTD      ;TEST FOR CONSOLE INPUT FOR CHANGE
21 00605 020370      LDA      0, MASK
22 00606 062077      MSKO     0            ;DISABLE MUX INTPS      MASK=000200
23 00607 102400      SUB      0, 0      ;CLEAR AC0 FOR START LINE
24 00610 126400      SUB      1, 1      ;CLEAR AC1 FOR TURN OFF
25 00611 030371      LDA      2, MCOUNT
26 00612 061034 TRNOFF: DOA      0, MUX      ;SET CURRENT LINE, TURNS OFF ALL LINES
27 00613 067034      DOC      1, MUX      ;TURN OFF CURRENT LINE
28 00614 101400      INC      0, 0      ;POINT TO NEXT LINE
29 00615 151404      INC      2, 2, SZR    ;ADJUST LOOP CONTROL, SKIP IF DONE
30 00616 000774      JMP      TRNOFF      ;DO AGAIN
31 00617 020375      LDA      0, QUADR
32 00620 126520      SUBZL    1, 1      ;GET TURN ON VALUE IN AC1
33 00621 030372      LDA      2, LINCH    ;GET LINE CHARACTERISTICS
34 00622 061034      DOA      0, MUX      ;SET XMTR TO CURRENT LINE
35 00623 060234      NIOC     MUX      ;ONLINE
36 00624 067034      DOC      1, MUX      ;TURN ON OUT ADR
37 00625 073034      DOC      2, MUX      ;SET UP LINE
38 00626 101213      MOVR#    0, 0, SNC    ;SKIP IF XMTR
39 00627 000415      JMP      RCVR
40 00630 024373 XLOOP: LDA      1, XDATA      ;GET XMIT DATA
41 00631 066034      DOB      1, MUX      ;XMIT DATA
42 00632 102400      SUB      0, 0
43 00633 101405      INC      0, 0, SNR
44 00634 000737      JMP      START
45 00635 063634 WAIT:  SKPDN    MUX      ;
46 00636 000775      JMP      .-3      ;WAIT FOR DONE
47 00637 060434      DIA      0, MUX      ;WHO SET DONE?
48 00640 060234      NIOC     MUX      ;CLEAR DONE
49 00641 101213      MOVR#    0, 0, SNC    ;XMIT
50 00642 000731      JMP      START      ;NO
51 00643 000735      JMP      XSTAR      ;XMIT AGAIN
52 00644 102400 RCVR:  SUB      0, 0
53 00645 101405      INC      0, 0, SNR
54 00646 000725      JMP      START      ;STOP WAITING FOR DONE
55 00647 063634      SKPDN    MUX      ;WAIT FOR INPUT CHAR TO SET DONE
56 00650 000775      JMP      .-3
57 00651 060434      DIA      0, MUX      ;
58 00652 101212      MOVR#    0, 0, SZC    ;RECEIVE?
59 00653 000720      JMP      START      ;NO
60 00654 061634      DIBC     0, MUX      ;GET RECEIVE DATA AND CLEAR DONE

```

```

0006 PTIE
01 00655 040373      STA    0,XDATA      ;SAVE IT TO ECHO BACK LATER
02 00656 010375      ISZ    @QUADR      ;SET BIT 15 TO ECHO BACK ON TRANSMIT
03 00657 000723      JMP    RSTAR       ;GO ECHO
04
05 00660 000000 XXX:  0          ;DUMMY ADDRESS FOR END
06                      ;OF TESTING
07                      ;THE FOLLOWING ROUTINES REPLACE THE OCTAL AND DECIMAL
08                      ;INPUT ROUTINES TO SEARCH FOR ^O, ^R, OR ^D AND JUMP TO
09                      ;THE APPROPRIATE PLACE IF ONE OF THESE CONTROL CHARS
10                      ;IS STRUCK.
11
12
13                      ;OCTAL INPUT ROUTINE
14 00661 000000      0
15 00662 054777 TTII: STA    3,-1
16 00663 050445      STA    2,TTS2      ;SAVE AC2
17 00664 006224      JSR@   ITI?0      ;GET CHARACTER
18 00665 004404      JSR    TTII1
19 00666 010773      ISZ    TTII-1
20 00667 030441 TTII2: LDA    2,TTS2
21 00670 002771      JMP@   TTII-1      ;RETURN+2
22
23                      ;ROUTINE LOOKS FOR ^O, ^R, ^L, ^E, OR ^D
24 00671 024240 TTII1: LDA    1,C3      ;NON-ZERO
25 00672 030432      LDA    2,TTCD
26 00673 142415      SUB#   2,0,SNR      ;IS IT CONTROL O?
27 00674 006233      JSR@   IOD?       ;YES
28 00675 030430      LDA    2,TTCR      ;OR CONTROL R?
29 00676 142415      SUB#   2,0,SNR
30 00677 000234      JMP    RES?T      ;YES
31 00700 030427      LDA    2,TTCD      ;OR CONTROL D?, CHANGE DATA
32 00701 142415      SUB#   2,0,SNR      ;
33 00702 000410      JMP    D
34 00703 030420      LDA    2,TTCL      ;OR CONTROL L?, CHANGE LINE
35 00704 142415      SUB#   2,0,SNR
36 00705 000407      JMP    L
37 00706 030420      LDA    2,TTCE      ;OR CONTROL E?, CHANGE XMIT/ECHO
38 00707 142415      SUB#   2,0,SNR
39 00710 000406      JMP    E
40 00711 001401      JMP    1,3        ;RETURN, WITHOUT MAIN RET BUMP
41
42 00712 044047 D:    STA    1,CHNG
43 00713 002406      JMP    @BEG4A
44 00714 044047 L:    STA    1,CHNG
45 00715 002405      JMP    @BEG3
46 00716 044047 E:    STA    1,CHNG
47 00717 002401      JMP    @IBEG4
48 00720 000455 IBEG4: BEG4
49 00721 000471 .BEG4A: BEG4A
50 00722 000441 .BEG3: BEG3
51 00723 000014 TTCL: 14
52 00724 000017 TTCD: 17
53 00725 000022 TTCR: 22
54 00726 000005 TTCE: 5
55 00727 000004 TTCD: 4
56 00730 000000 TTS2: 0
57
58
59                      ;DECIMAL INPUT ROUTINE
60 00731 054730 TTID: STA    3,TTII-1      ;DECIMAL INPUT ROUTINE

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0007 PTIE

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01 00732 050776      STA      2,TTS2      ;KEEP AC2
02 00733 006225      JSR@     ITI?D      ;GET DECIMAL
03 00734 004735      JSR      TTI11
04 00735 010724      ISZ     TTI1-1      ;
05 00736 000731      JMP     TTI12
06                  ;CHANGE ALL DEVICE CODES FROM THE LOCATION IN CALL+2
07                  ;UP TO BUT NOT THE LOCATION IN CALL+3, FROM THE OLD CODE
08                  ;WHOSE ADDRESS IS IN CALL+1 TO WHAT IS IN AC0.
09                  ;IGNORES CODE 77
10                  ;EXIT TO CALL+4
11 00737 171400 DCHNG: INC      3,2
12 00740 151400      INC      2,2
13 00741 050441      STA      2,DCH.5
14 00742 024441      LDA      1,DCH.1
15 00743 037376      LDA      3,0-2,2
16 00744 137400      AND      1,3
17 00745 057376      STA      3,0-2,2
18 00746 123400      AND      1,0
19 00747 040435      STA      0,DCH.6
20 00750 031377      LDA      2,-1,2
21 00751 136414      SUB#     1,3,SZR
22 00752 122415      SUB#     1,0,SNR
23 00753 000424      JMP     DCH.2
24 00754 021000 DCH.4: LDA      0,0,2
25 00755 103112      ADDL#    0,0,SZC      ;IS IT AN I.O. INSTR?
26 00756 101103      MOVL    0,0,SNR
27 00757 103113      ADDL#    0,0,SNR
28 00760 000412      JMP     DCH.3      ;NO
29 00761 101200      MOVR    0,0
30 00762 162400      SUB      3,0
31 00763 123414      AND#     1,0,SZR
32 00764 000406      JMP     DCH.3      ;NOT OLD DEVICE CODE
33 00765 034417      LDA      3,DCH.6
34 00766 163000      ADD      3,0
35 00767 041000      STA      0,0,2
36 00770 034412      LDA      3,DCH.5
37 00771 037776      LDA      3,0-2,3
38 00772 151400 DCH.3: INC      2,2
39 00773 022407      LDA      0,0DCH.5
40 00774 142414      SUB#     2,0,SZR
41 00775 000757      JMP     DCH.4
42 00776 034406      LDA      3,DCH.6
43 00777 030403 DCH.2: LDA      2,DCH.5
44 01000 057376      STA      3,0-2,2
45 01001 001001      JMP     1,2
46 01002 000000 DCH.5: 0
47 01003 000077 DCH.1: 77
48 01004 000000 DCH.6: 0
49
50                  O?DTD 2
51      002401 BDDDD= JMP     .@+1
52 02177 000401      BEG1
53 02563 000000 EGGS: 0      ;AUTO RUN SWITCH
54 02564 000000      0      ;DEVICE CODE
55 02565 000000      0      ;CAT SWITCH
56 02566 000000      0      ;# OF PASSES
57 02567 000000      0      ;RETURN ADDRESS
58 02570 000000 SWREG: 0      ;SWITCH REGISTER
59 02571 005215 MCODE: .TXTE !<15><12>TYPE 2 DIGIT DEVICE CODE OF PTI CONTROLLER.
60 02617 152254      THEN CARRIAGE RETURN !

```

0008 PTIE

01 02633 005215 INPDS: TXTE !<15><12>TYPE 1 IF NEW PARAMETERS DESIRED !
02 02656 005215 WLINE: TXTE !<15><12>TYPE ADDRESS OF LINE(IN DECIMAL) !
03 02701 005215 XMTREC: TXTE !<15><12>1=XMIT OR 0=ECHO? !
04 02714 005215 PARTY: TXTE !<15><12>PARITY 0=NONE 1=ODD 2=EVEN !
05 02734 005215 STOPB: TXTE !<15><12># OF STOP BITS 1 OR 2 !
06 02752 044327 WCLK: TXTE !WHICH CLOCK? 0,1,2 OR 3 !
07 02767 005215 LWORD: TXTE !<15><12>WORD LENGTH ? 5,6,7 OR 8 !
08 03006 005215 ODATA: TXTE !<15><12>XMIT DATA IN OCTAL !
09 03022 005215 DIRT: TXTE !<15><12>... C. S. I. PTI CRT XMIT/ECHO PROGRAM REV. 00 !
10 000000 .NOLOC 0
11 .END
**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS

0009 PTIE

AC0?	002360	7/53							
AC1?	002361	7/53							
AC2?	002362	7/53							
AC3?	000207	2/21	7/53						
BDADR	000374	3/26	3/38	5/08	5/11	5/16			
BDDDD	002401	7/51	7/53						
BEG0	000571	2/55	2/58	3/29	3/41	3/49	4/46	5/10	
BEG1	000401	2/21	2/44	7/52					
BEG2	000420	2/51	2/59	3/03	3/06	3/09			
BEG3	000441	3/18	3/21	3/24	6/50				
BEG4	000455	3/30	3/33	3/35	6/48				
BEG4A	000471	3/42	3/45	6/49					
BEG5	000501	3/37	3/50	3/53	3/56				
BEG6	000514	4/01	4/04	4/07	4/10				
BEG7	000536	4/19	4/22	4/24	4/27				
BEG8	000554	4/33	4/36	4/39					
BGN?A	000202	2/21							
C100K	000246	2/36	3/57						
C10?0	001444	7/49							
C1B?6	002515	7/53							
C3	000240	2/30	3/54	6/24					
C4	000241	2/31	4/08						
C40	000244	2/34	4/29						
C5	000242	2/32	4/11						
C76	000245	2/35	3/04						
C9	000243	2/33	4/05						
CAC?0	001031	7/49							
CHR?	002353	7/53							
CHR?3	001044	7/49							
CHC?T	001032	7/49							
CHE?X	001050	7/49							
CHNG	000047	2/15	2/46	3/27	3/39	3/47	6/42	6/44	
		6/46							
CHR?E	001030	7/49							
CHR?Z	001157	7/49							
CM256	000251	2/39	3/22						
CM4	000247	2/37	4/37						
CM512	000252	2/40							
CM9	000250	2/38							
CRL?F	001054	2/21	7/49						
CYC?2	002304	7/53							
CYC?I	002245	7/53							
CYC?J	002227	2/21	7/53						
CYC?X	002220	2/21	7/53						
D	000712	6/33	6/42						
DCHNG	000737	2/19	7/11						
DCH.1	001003	7/14	7/47						
DCH.2	000777	7/23	7/43						
DCH.3	000772	7/28	7/32	7/38					
DCH.4	000754	7/24	7/41						
DCH.5	001002	7/13	7/36	7/39	7/43	7/46			
DCH.6	001004	7/19	7/33	7/42	7/48				
DCO?T	001121	7/49							
DEC?T	001122	7/49							
DET?B	001162	7/49							
DEVCD	000046	2/14	3/12	3/16					
DIRT	003022	2/48	8/09						
DIV?	002314	7/53							
DIV?0	002315	7/53							

0010 PTIE

DIY?D	002320	7/53						
DTO?S	000200	2/05	2/21					
D?IAG	025076	MC 7/53						
E	000716	6/39	6/46					
EGGS	002563	2/11	2/21	7/53				
EHALT	006230	2/29						
ENT?R	002200	2/21	7/53					
ERR?1	002461	7/53						
ERR?2	002452	7/53						
ERR?3	002501	7/53						
ERR?4	000211	2/21	7/53					
ERR?5	002510	7/53						
ERR?6	002414	7/53						
ERR?A	002433	7/53						
ERR?I	002401	7/53						
ERR?J	002363	2/21	7/53					
ERR?N	002457	7/53						
ERT?N	002355	7/53						
FST?D	001337	7/49						
HER?D	002516	7/53						
HEL?P	000201	2/21	7/53					
I12?1	001734	7/49	7/51					
IBEG4	000720	6/47	6/48					
ICRL?	000216	2/21	7/49	7/51	7/53			
ICYC?	000227	2/21	7/53					
ICY?C	000231	2/21	2/28					
IDCHN	000051	2/19	3/11					
IEGG?	000212	2/21	7/53					
IENT?	000226	2/21						
IERR?	000230	2/21	2/29					
IINP?	000214	2/21	7/53					
IINR?	001765	7/51						
IMES?	000215	2/21	2/47	2/52	2/59	3/18	3/30	3/42
		3/50	4/01	4/19	4/33	7/51	7/53	
IN0?	001534	7/49						
IN1?	001621	7/49						
IN1?0	001515	7/49						
IN1?2	001736	7/49	7/51					
IN1?3	001514	7/49						
IN1?5	001737	7/49	7/51					
IN2?	001626	7/49						
IN3?	001503	7/49						
IN3?3	001513	7/49						
IN4?	001667	7/49						
IN5?	001553	7/49						
IN6?	001567	7/49						
IN6?0	001735	7/49	7/51					
INB?A	001731	7/49	7/51					
INB?I	001732	7/49	7/51					
INL?K	001517	7/49						
INM?	001643	7/49						
INPDS	002633	2/53	8/01					
INP?1	001521	7/49						
INP?I	001524	7/49						
INP?J	001527	7/49						
INP?K	002157	2/21	7/51					
INP?Q	001721	7/49	7/51					
INP?R	001727	7/49	7/51					

0011 PTIE

INR?	001571	7/49	7/51						
INR?1	002170	7/51							
INR?K	002167	7/51							
INR?O	002171	7/51							
INS?	001733	7/49							
INS?0	001723	7/49							
INS?1	001724	7/49							
INS?2	001725	7/49							
INS?3	001726	7/49	7/51						
INS?A	001722	7/49	7/51						
INS?Y	001703	7/49	7/51						
INS?X	001764	7/51							
INT?	001407	7/49							
INT?E	001516	7/49							
IN?PR	001520	7/49							
I00T?	000233	2/21	6/27	7/51					
I0M?O	000235	2/25	7/49	7/53					
IPDC?	000221	2/21	7/49	7/51	7/53				
IPDE?	000220	2/21							
IPOC?	000222	2/21	7/51	7/53					
ISWR?	000213	2/21	7/49	7/53					
ITI?O	000225	2/21	7/02						
ITI?O	000224	2/21	6/17						
ITPS?	000232	2/21	7/49	7/51					
ITR?	002347	7/53							
ITR?C	002351	7/53							
ITR?R	000206	2/21	7/53						
ITR?T	002350	7/53							
ITTD	000236	2/26	3/20	3/32	3/52	4/03	4/21	4/35	
		5/20							
ITTI	000237	2/27	2/54	3/02	3/44				
ITYP?	000217	2/21	7/49						
IZOC?	000223	2/21	7/51	7/53					
K10?0	002356	7/53							
K12?	001063	7/49							
K15?	001064	7/49							
L	000714	6/36	6/44						
LINCH	000372	3/60	4/16	4/18	4/30	4/32	4/42	4/44	
		5/06	5/33						
LOOPX	006231	2/28							
LOO?R	002346	7/53							
LOO?T	002536	7/53							
LOP?E	002352	7/53							
LWORD	002767	4/02	8/07						
MASK	000370	5/04	5/21						
MCODE	002571	2/60	7/59						
MCOUN	000371	5/05	5/25						
MDV?1	002357	7/53							
MDV?2	002323	7/53							
MDV?3	002332	7/53							
MDV?4	002337	7/53							
MDV?5	002354	7/53							
MES?M	001013	7/49							
MES?S	001005	2/21	7/49						
MUL?	002334	7/53							
MUL?A	002335	7/53							
010?1	001741	7/51							
001?2	001736	7/51							

0012 PTIE

001?5	001737	7/51			
006?0	001735	7/51			
007?	002143	7/51			
00ATA	003006	3/43	8/08		
00A?	001742	7/51			
00A?C	001740	7/51			
00A?L	002065	7/51			
00B?E	002126	7/51			
00B?P	002005	7/51			
00D?B	002002	7/51			
00D?R	002107	7/51			
00D?T	002147	7/51			
00E?1	002132	7/51			
00E?2	002134	7/51			
00E?4	002141	7/51			
00E?Q	002145	7/51			
00I?N	002152	7/51			
00I?T	002144	7/51			
00L?C	002053	7/51			
00L?T	002151	7/51			
00O?C	002073	7/51			
00O?F	002150	7/51			
00O?K	000210	2/21	7/51		
00P?C	001751	7/51			
00R?T	001752	7/51			
00T?1	001776	7/51			
00T?2	002021	7/51			
00T?3	002155	7/51			
00T?I	001766	7/51			
00T?J	001771	2/21	7/51		
00T?K	002172	7/51			
00T?P	002154	7/51			
00U?A	002146	7/51			
00W?T	002024	7/51			
00ADR	000375	5/09	5/17	5/31	6/02
0?D?D	000527	MC	7/50		
0?D?P	022740	MC	7/50		
P1???	001340		7/49		
P3???	001026		7/49		
PAC?0	001155		7/49		
PAC?1	001302		7/49		
PAC?2	001156		7/49		
PARTY	002714	3/51	8/04		
PAS?S	000203	2/21	7/53		
PA?C1	001446		7/49		
PA?C3	001445		7/49		
PA?SI	000204	2/21			
PA?SV	000205	2/21			
PC1?0	001161		7/49		
PC1?1	001027		7/49		
PC1?2	001440		7/49		
PC1?5	001441		7/49		
PC4?0	001311		7/49		
PC6?0	001160		7/49		
PC??	001312		7/49		
PCR?Y	001154		7/49		
PDC?1	001114		7/49		
PDC?2	001112		7/49		

0013 PTIE

PDC?S 001077	2/21	7/49						
PDE?C 001107	2/21	7/49						
PLP?T 001237	7/49							
POC?T 001071	2/21	7/49						
PSP? 001024	7/49							
P?GOU 024652 MC	2/20							
RBG?0 001502	7/49							
RCVR 000644	5/39	5/52						
RES?T 000234	2/22	6/30	7/49					
RSTAR 000602	5/18	6/03						
RST?R 001172	7/49							
RTN?A 001153	7/49							
RUB? 001466	7/49							
SAV?E 001164	7/49							
SPT?G 001025	7/49							
START 000573	3/13	4/47	5/11	5/44	5/50	5/54	5/59	
STR?T 001730	7/49							
STOPB 002734	4/20	8/05						
STO?P 002551	7/53							
SWREG 002570	2/21	7/58						
S?WPD 000050 MC	7/49							
S?WPK 021330 MC	7/49							
TAC?0 001304	7/49							
TAC?C 001310	7/49							
TEM 000050	2/16	3/10	3/15					
TIN?1 001442	7/49							
TIN?2 001443	7/49							
TIN?A 001447	7/49							
TIN?C 001313	7/49							
TIN?D 001353	2/21	7/49						
TIN?M 001410	7/49							
TIN?N 001421	7/49							
TIN?O 001347	2/21	7/49						
TIN?Q 001356	7/49							
TIN?R 001316	7/49							
TIN?S 001363	7/49							
TIN?W 001367	7/49							
TIN?X 001315	7/49							
TIN?Z 001357	7/49							
TMP? 001163	7/49							
TOD?T 001341	7/49	7/51						
TO?DT 002156	7/51							
TPR?T 001257	7/49							
TPS?P 001200	2/21	7/49						
TP?? 002153	7/51							
TRNOF 000612	5/26	5/30						
TSI? 001320	7/49							
TTCD 000727	6/31	6/55						
TTCE 000726	6/37	6/54						
TTCL 000723	6/34	6/51						
TTCO 000724	6/25	6/52						
TTCR 000725	6/28	6/53						
TTID 000731	2/26	6/60						
TTII 000662	2/27	6/15	6/19	6/21	6/60	7/04		
TTII1 000671	6/18	6/24	7/03					
TTII2 000667	6/20	7/05						
TT52 000730	6/16	6/20	6/56	7/01				
TTY? 001222	7/49							

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TYP?E 001203	2/21	7/49		
TYP?R 001307	7/49			
T?TY0 016366 MC	7/49			
WAIT 000635	5/45			
WCLK 002752	4/34	8/06		
WHAT 000400	2/43	2/49	4/45	
WLINE 002656	3/19	8/02		
XDATA 000373	3/46	5/07	5/40	6/01
XLOOP 000630	5/40			
XMTRE 002701	3/31	8/03		
XSTAR 000600	5/16	5/51		
XXX 000660	3/14	6/05		
ZOC?T 001065	2/21	7/49		
ZPO?T 001074	7/49			
ZSU?P 001303	7/49			
. BEG3 000722	6/45	6/50		
. BEG4 000721	6/43	6/49		
?F 000000	2/21			
?G 000001	2/21			

01 ; *****
02 ;
03 ; DESCRIPTION: PROGRAMMABLE MUX RELIABILITY
04 ;
05 ;
06 ; CUSTOM SYSTEMS INC, 1981
07 ; *****

09 .TITL PMUXR

000001 .DUSR X=1

10 ;1.0 PROGRAM NAME - PMUXR.SR

11 ;
12 ;2.0 REVISION HISTORY:

REV	DATE	COMMENTS
00	06/26/81	
01	09/17/81	TEXT CORRECTIONS, AND OUTPUT XFERS

17 ;3.0 MACHINE REQUIREMENTS

- 18 ;3.1 NOVA/ECLIPSE FAMILY PROCESSOR
- 19 ;3.2 CONSOLE DEVICE
- 20 ;3.3 16K READ/WRITE MEMORY
- 21 ;3.4 HOST OR EXPANSION CHASSIS CONTAINING ANY COMBO OF
- 22 ; PTI OR PSI CONTROLLERS NOT TO EXCEED 256 LINES.
- 23 ;3.5 OPTIONAL HARDWARE SUPPORTED:
- 24 ; DCU 50 OR DCU 200 (BACKPLANE JUMPER PLUG REQUIRED)

26 ;4.0 TEST REQUIREMENTS -
27 ; JUMPER PLUGS REQUIRED FOR MODEM SIGNAL TESTING.

29 ;5.0 SUMMARY

31 ; THE PROGRAMMABLE MUX RELIABILITY TEST IS DESIGNED TO EXERCISE
32 ; THE COMMUNICATIONS SYSTEM. THE METHOD OF TEST CONSISTS OF
33 ; TRANSMITTING AND RECEIVING (VIA MAINTENANCE FEATURES OF
34 ; THE HARDWARE) PSEUDO RANDOM CHARACTERS. SINCE CHAR-
35 ; ACTERISTICS ARE DETERMINED VIA RANDOM NUMBER GENERATORS
36 ; AND ARE CHANGED PERIODICALLY, SELECTION OF LINES FOR
37 ; TESTING IS VIA THE CONSOLE TELETYPE.

39 ;6.0 RESTRICTIONS

40 ; THE PTID AND PSID PROGRAMS SHOULD BE RUN
41 ; BEFORE RUNNING PMUXR.

01 ; 7.0 PROGRAM DESCRIPTION/THEORY OF OPERATION
02 ; IN EACH CONFIGURATION THE PROGRAM HAS 3 BASIC PARTS:
03 ; 1) INITIALIZATION, 2) DCU OR MONITOR SECTION, 3) DONE
04 ; CHECK OR INTERRUPT ROUTINE.
05 ;
06 ; 7.1 INITIALIZATION: THE PROGRAM ASKS THE USER TO DEFINE
07 ; THE SYSTEM CONFIGURATION BY USING A SERIES OF QUESTIONS.
08 ; THE INFORMATION IS THEN STORED IN TABLES AND FLAG
09 ; LOCATIONS FOR LATER USE.
10 ;
11 ; 7.2 DCU PROGRAM: THIS DESCRIBES THE PROGRAM FOR CONFIGURATIONS
12 ; WITH A DCU. THE PROGRAM IS IN FOUR BASIC PARTS:
13 ; HOST NON-INTERRUPT, HOST INTERRUPT, DCU NON-INTERRUPT,
14 ; AND DCU INTERRUPT. FOR SYSTEMS WITHOUT A DCU, THE HOST
15 ; INTERRUPT PROGRAM IS REPLACED BY THE DCU INTERRUPT
16 ; ROUTINE, AND THE DCU NON-INTERRUPT PACKAGE BECOMES A
17 ; SUBROUTINE, CALLED PERIODICALLY BY THE HOST MONITOR. THE
18 ; OPERATION AND INTERACTIONS OF THESE ROUTINES IS AS
19 ; FOLLOWS:
20 ;
21 ; INITIALIZATION - OPERATOR INPUTS DEFINE THE COM-
22 ; MUNICATIONS CONTROLLERS AND DCU DEVICE CODES, LINES TO
23 ; BE TESTED, AND MODEM AND CRC LINES. THE PROGRAM WILL THEN
24 ; DEFINE THE LCB BLOCKS (SEE 11.9) FOR ACTIVE LINES, ALLOCATE
25 ; TRANSMIT AND RECEIVE BUFFERS, CHOOSE RANDOM LINE CHAR-
26 ; ACTERISTICS AND BLOCK LENGTHS, AND FILL THE TRANSMIT
27 ; BUFFERS WITH RANDOM DATA. RANDOM DLE WORDS, SPECIFIC
28 ; ALLOWABLE SYNC WORDS (SEE STABLE), FORCED UNDER-RUNS,
29 ; ENTER AND LEAVE TRANSPARENCY, AND BREAK CHARACTERS
30 ; ARE ALSO LOADED AT VARIOUS INTERVALS IN THE TRANSMIT
31 ; TABLES. IF MODEM IS SELECTED, RANDOM CHANGE SEQUENCES
32 ; ARE SELECTED FOR THE SYNC LINES AND A SPECIFIC ON/OFF
33 ; SEQUENCE FOR ASYNC ARE LOADED (SEE GMOD AND GAMOD).
34 ; AFTER ALL INITIALIZATION IS COMPLETED, THE
35 ; DCU PROGRAM IS LOADED INTO DCU SC MEMORY (IF APPLICABLE)
36 ; AND THE START-UP PORTION OF THE DCU ROUTINE (DMAIN) IS
37 ; EXECUTED. IF NO DCU, DMAIN IS CALLED AS A SUBROUTINE.
38 ; DMAIN OUTPUTS LINE CHARACTERISTICS (AFTER TURNING OFF
39 ; AND INITIALIZING ALL LINES), TURNS ON ACTIVE TRANSMITTERS
40 ; AND RECEIVERS, AND OUTPUTS INITIAL MODEM STATES.
41 ; THE ACTUAL PROGRAM OPERATION HAS NOW BEGUN.
42 ; IT IS A CAUSE-AND-EFFECT INTERACTION BETWEEN THE HOST
43 ; MONITOR AND CHECKING ROUTINES AND DCU (OR DMAIN'S SUB-
44 ; ROUTINE) MONITOR ROUTINE. DATA IS TRANSMITTED FROM THE
45 ; BUFFERS ON A TRANSMIT INTERRUPT AND RECEIVED AND STORED
46 ; (ALONG WITH ERROR STATUS) IN THE INTERRUPT ROUTINE WITH
47 ; A MINIMUM OF ERROR CHECKING. THE DCU MONITOR ROUTINE
48 ; WILL MONITOR AND DETECT WHEN A LINE HAS TRANSMITTED AND
49 ; RECEIVED (VIA EOT CHARACTER) A FULL BLOCK OF DATA, THEN
50 ; SHUT DOWN THE LINE AND SET A BLOCK DONE BIT IN THE MCW
51 ; FOR THE HOST. THE HOST WILL MONITOR LINE ACTIVITY, AND,
52 ; UPON RECEIPT OF THE BLOCK DONE BIT, WILL COMPARE THE
53 ; TRANSMIT AND RECEIVE DATA AND RECORD AND PRINT OUT ANY
54 ; ERROR CONDITION. AFTER CHECKING ALL DATA, THE HOST WILL
55 ; CHANGE LINE CHARACTERISTICS (IF NO ERRORS AND SWITCH
56 ; 1(1)), GENERATE A NEW BLOCK OF DATA, AND SIGNAL THE DCU
57 ; (VIA BIT 1 OF THE MCW) TO START THE LINE AGAIN. THIS
58 ; PROCESS IS REPEATED CONTINUALLY ON ALL LINES. MODEMS
59 ; ARE HANDLED IN A SIMILAR MANNER.
60 ; CERTAIN ERRORS ARE DETECTED DURING DCU INTERRUPT

0003 PMUXR

01 ; TIME, AND, WHEN FOUND, THE DCU WILL INTERRUPT THE HOST
02 ; TO ALLOW PRINTING OF THE ERROR MESSAGE.

!0004 PMUXR

01
02 S?MPD 8.

03
04 ; 8.2.2 SWITCHES DEFINED FOR PMUXR (ADDENDUM TO 8.2)

05 ;	BIT	OCTAL	BINARY	INTERPRETATION
06 ;		VALUE	VALUE	
07 ;	F		1	REQUEST OPERATOR PARAMS
08 ;		000001	0	NO PARAMS
09 ;				
10 ;	E	000002	1	PROCEED FROM ERROR
11 ;			0	-----
12 ;				
13 ;	D	000004	1	SKIP PHASE 5 FOR DUAL MODE
14 ;			0	-----
15 ;				
16 ;	C	000010	1	INHIBIT LINE ASSIGN PRINTOUT
17 ;			0	-----
18 ;				

```
01 ;9.0 OPERATING PROCEDURE
02 ;
03 ;9.1 CONNECT MODEM TEST PLUGS IF IT IS DESIRED
04 ; TO TEST ANY MODEM LINES
05 ;
06 ;9.2 LOAD THE TEST PROGRAM VIA THE BINARY LOADER OR
07 ; DIAGNOSTIC OPERATING SYSTEM. IF AN ECLIPSE IOP IS TO BE USED
08 ; THE PROGRAM WILL RUN IN THE HOST DIRECTORY, IF THE
09 ; COMMUNICATIONS LINES ARE CONNECTED TO THE IOP. IF THE
10 ; LINES ARE CONNECTED TO A DCU WHICH IS CONNECTED TO THE
11 ; IOP, THEN THE PROGRAM MUST BE RUN FROM THE IOP DIRECT-
12 ; ORY.
13 ;
14 ;
15 ;9.3 SET CONSOLE SWITCHES TO 200. PRESS START.
16 ;
17 ;9.4 THE PROGRAM WILL OUTPUT A MESSAGE TO INDICATE
18 ; IF MANUAL INPUT TO SPECIFY DETAILED LINE PARAMETERS
19 ; IS REQUIRED. TYPING A ONE WILL RESULT IN QUESTIONS
20 ; ABOUT DETAILED LINE SPECIFICATIONS LATER. TYPING ANY
21 ; OTHER CHARACTER ALLOWS THE PROGRAM TO SPECIFY ITS
22 ; OWN RANDOMLY SELECTED CHARACTERISTICS.
23 ;
24 ;9.5 ;THE PROGRAM WILL ASK TO SELECT THE SYSTEM CONFIGURATION
25 ; EITHER A DCU/50/200, AN ECLIPSE IOP
26 ; OR NONE. THE OPERATOR SHOULD TYPE THE PROPER RESPONSE
27 ;
28 ;9.6 THE PROGRAM WILL REQUEST THE DEVICE CODE TO BE
29 ; TYPED. THE OPERATOR SHOULD RESPOND WITH THE TWO
30 ; DIGIT OCTAL DEVICE CODE ASSIGNED TO THE COMM
31 ; SYSTEM (EITHER 34 OR 44) FOLLOWED BY A CARRIAGE
32 ; RETURN.
33 ;
34 ;9.7 IF A DCU IS IN THE SYSTEM THE PROGRAM WILL REQUEST
35 ; THE 2 DIGIT OCTAL NUMBER OF THE DCU DEVICE CODE
36 ; (0-76 ACCEPTABLE)
37 ;
38 ;9.8 "TYPE 1 IF MODEM CONTROL, 0 IF NOT." IF
39 ; MODULES ARE TO BE TESTED ENTER 1, IF NOT ENTER 0.
40 ;
41 ;9.9 "TYPE 1 IF CRC OPTION, 0 IF NOT." IF CRC
42 ; OPTIONS ARE TO BE TESTED TYPE 1, IF NOT TYPE 0.
43 ;
44 ;9.10 "TYPE THE FIRST LINE ADDRESS AND THE LAST LINE
45 ; ADDRESS OF EACH LINE MODULE IN THE SYSTEM IN THIS
46 ; FORM FLA/LLA,FLA/LLA." IN ORDER TO TELL WHICH LINE
47 ; ADDRESSES DELIMIT LINE MODULES THE OPERATOR MUST
48 ; TYPE IN THE FIRST LINE ADDRESS FOLLOWED BY A /
49 ; FOLLOWED BY THE LAST LINE ADDRESS FOR EACH LINE MODULE
50 ; IN THE SYSTEM. FOR EXAMPLE, IF THE SYSTEM CONTAINED
51 ; TWO LINE MODULES WITH ADDRESSES. 0 THRU 8 AND 98 THRU 99
52 ; THE ENTRY WOULD BE 0/8,98/99
53 ;NOTE: THE PROGRAM WILL DETECT AN ERROR AND REPEAT THE INPUT
54 ; REQUEST IF ANY OF THE FOLLOWING INPUT ERRORS ARE
55 ; COMMITTED:
56 ; 1. A LINE NUMBER GREATER THAN 256 (DECIMAL) IS
57 ; TYPED.
58 ; 2. MULTIPLY DEFINED LINES.
59 ; 3. A SYNC LINE THAT IS ALREADY DEFINED AS ASYNC.
60 ; 4. A SECOND LINE (FOLLOWING SLASH) LESS THAN
```

```
01 ; FIRST LINE
02 ;9.11 "TYPE ASYNCHRONOUS LINES TO BE TESTED"
03 ; ENTER THE LINE ADDRESS OF LINES TO BE TESTED.
04 ;
05 ;9.12 "TYPE SYNCHRONOUS LINES TO BE TESTED"
06 ; ENTER THE LINE ADDRESSES OF SYNC LINES TO BE
07 ; TESTED. IF NONE, TYPE N
08 ;
09 ;9.13 "TYPE MODEM LINES TO BE TESTED" THIS IS
10 ; ONLY ASKED IF QUESTION # 9.8 IS ANSWERED YES.
11 ;
12 ;9.14 "TYPE CRC LINES TO BE TESTED" THIS IS ONLY
13 ; ASKED IF QUESTION #9.9 IS ANSWERED YES.
14 ;
15 ;9.15 IF OPERATOR INPUT IS DESIRED THE PROGRAM WILL
16 ; ASK A SERIES OF QUESTION TO BE ANSWERED AS OPERATOR
17 ; INPUTS THE QUESTIONS ARE:
18 ; "ALL LINES OF THIS TYPE?"
19 ; "ENTER LINE NO" ONLY ACTIVE LINES ARE ALLOWED IF
20 ; INACTIVE LINE NO IS TYPED, ERROR MESSAGE "NOT AN
21 ; ACTIVE LINE" APPEARS FOLLOWED BY LINE NO QUESTION.
22 ;
23 ; "ENTER BAUD CLOCK" 0,1,2,3 ALLOWED
24 ; "ENTER # OF STOP BITS# 1 OR 2 ALLOWED
25 ; "ENTER # OF BITS PER WORD" 0-7 ALLOWED
26 ; "ENTER PARITY (0=NO PARITY 1=ODD 2=EVEN)
27 ; "ENTER CRC POLY" ASKED ONLY IF APPLICABLE
28 ; "ENTER DATA (N=RANDOM)"
29 ; "ANY OTHER LINES"
30 ; THIS CONTINUES UNTIL 0 IS ANSWERED OR ANY OTHER LINE
31 ; QUESTION
```


01 ;10.0 PROGRAM OUTPUT/ERROR DESCRIPTION -
02 ;
03 ;10.1 "DCU FAILED TO START" THIS MESSAGE WILL
04 ; INDICATE THAT THE DCU UPON LOADING ITS MEMORY
05 ; OR WHEN STARTING THE PROGRAM DID NOT GO BUSY
06 ; AFTER A CERTAIN DELAY TIME.
07 ;
08 ; HINT - COULD BE WRONG DEVICE CODE -
09 ;
10 ;10.2 "DCU FAILED TO STOP" INDICATES THAT DCU UPON
11 ; LOADING ITS MEMORY OR UPON EXECUTING A STOP SUBROUTINE
12 ; DID NOT STOP OR GO NOT BUSY AFTER A CERTAIN DELAY
13 ; TIME.
14 ;
15 ;10.3 "POWER FAIL" INDICATES A POWER FAIL ON THE
16 ; HOST CHRASIS-
17 ;
18 ;10.4 THE FOLLOWING ERROR MESSAGES REFER TO MODES
19 ; (ABCD) WHEN TESTING LINE MODULES -
20 ;
21 ; 10.4.1 "TRANSMITTER (OR RECEIVER) FAILED TO SET DONE"
22 ; -APPEARS WHEN TRANSMIT OR RECEIVE COUNT FOR AN ACTIVE
23 ; LINE REMAINS 0 AFTER A SPECIFIC TIME INTERVAL AS DE-
24 ; TERMINED BY THE COUNTER IN MCW WORD.
25 ;
26 ;
27 ; 10.4.2 "LOSS OF LINE ACTIVITY" - APPEARS WHEN A LINE
28 ; FAILS TO SET BLOCK DONE AFTER STARTING FOR A SPECIFIC
29 ; AMOUNT OF TIME. A MAXIMUM TIME COUNTER IS PROVIDED
30 ; FOR THIS PURPOSE WHICH IS COUNTED EVERY TIME THE
31 ; MONITOR ROUTINE (DMNG) IS CALLED. ITS TIME OUT VALUE
32 ; IS GIVEN IN "TIMEX".
33 ;
34 ; 10.4.3 ANY STATUS ERROR IS REPORTED AS "PARITY ERROR",
35 ; "FRAMING ERROR" OR "OVERRUN ERROR".
36 ;
37 ; 10.4.4 AN ERROR MESSAGE APPEARS WHEN TRANSMITTED AND
38 ; RECEIVED DATA DEFER FROM EACH OTHER, IN WHICH "GOOD"
39 ; REFERS TO THE TRANSMITTED AND "BAD" REFERS TO THE
40 ; RECEIVED DATA.
41 ;
42 ; 10.4.5 "FAILED TO DETECT BREAK" - APPEARS WHEN AN ASYNC
43 ; LINE RECEIVES FIVE NULL CHARACTERS IN A ROW WITHOUT
44 ; A FRAMING ERROR DURING A BREAK SEQUENCE. (A BREAK
45 ; SEQUENCE CONSISTS OF OUTPUTTING A SEQUENCE OF A NULL,
46 ; TWO BREAK AND TWO NULL CHARACTERS.)
47 ;
48 ; 10.4.6 "FAILURE TO OPERATE IN XPRENCY" - APPEARS WHEN
49 ; THE FIRST CHARACTER RECEIVED AFTER CHANGING XPRENCY
50 ; MODE IN A SYNC LINE IN NOT A DLE CHARACTER.

!0008 PMUXR

01 ;
02 ; 10. 4. 7 "UNDERRUN IN XPARENT MODE WITH DLE" - APPEARS
03 ; WHEN TWO SUCCESSIVE SYNC CHARACTERS ARE RECEIVED WHILE
04 ; UNDERRUNNING IN TRANSPARENT MODE.
05 ;
06 ; 10. 4. 8 "LINE FAILED TO UNDERRUN" - APPEARS WHEN THE
07 ; UNDERRUN SEQUENCE OF DLE AND SYNC IN TRANSPARENT MODE
08 ; OR SYNC CHARACTERS IN NON-TRANSPARENT MODE IS BROKEN
09 ; BY A NON-SYNC CHARACTER.
10 ;
11 ; 10. 4. 9 "RECEIVE BUFFER OVERFLOW" - APPEARS WHEN THE END
12 ; OF RECEIVE BUFFER IS REACHED BEFORE THE END OF TRANSMIT
13 ; BUFFER.
14 ;
15 ; 10. 4. 10 "CRC DOES NOT CHECK" - APPEARS WHEN THE CAL-
16 ; CULATED CRC DOES NOT MATCH WITH THE HARDWARE'S CRC.
17 ;
18 ; 10. 4. 11 "MODEM LINE FAILED TO INTERRUPT" - APPEARS WHEN
19 ; NO MODEM INTERRUPT IS RECEIVED FROM AN ACTIVE LINE AFTER
20 ; SENDING OUT NEW MODEM STATUS AND WAITING FOR A SPECIFIC
21 ; AMOUNT OF TIME.
22 ;
23 ; 10. 4. 12 "MODEM INTERRUPT FROM ILLEGAL LINE" - APPEARS
24 ; AFTER RECEIVING MODEM INTERRUPT FROM AN INACTIVE LINE.
25 ;
26 ; 10. 4. 13 "FALSE INTERRUPT - NO CHANGE IN STATUS" - APPEARS
27 ; WHEN MODEM INTERRUPT IS RECEIVED FROM A LINE WITHOUT
28 ; CHANGE IN MODEM STATUS.
29 ;
30 ; 10. 4. 14 ANY MODEM STATUS RECEIVED THAT DEFERS FROM THE
31 ; THE STATUS SEND OUT IS REPORTED AS AN ERROR WITH A MES-
32 ; SAGE THAT, FOR EXAMPLE, MAY READ LIKE - "CHANGE IN RING
33 ; NO CHANGE IN RTS".
34 ;
35 ; 10. 4. 15 ANY INTERRUPT FROM A DEVICE OTHER THAN MUX OR
36 ; FROM AN INACTIVE LINE CAUSES AN ERROR MESSAGE TO APPEAR
37 ; WITH THE INTERRUPTING DEVICE CODE OR LINE NUMBER IN THE
38 ; MESSAGE.
39 ;
40 ; 10. 4. 16 "UNIDENTIFIABLE ERROR-XMITS RECYS TOO FAR APART"
41 ; -APPEARS WHEN XMIT COUNT<1/2(RECV COUNT) OR RECV COUNT
42 ; <1/2(XMIT COUNT).

!0009 PMUXR

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01 ;10.5 THE FOLLOWING MESSAGES WILL APPEAR FOR MODES
02 ; (CD). THEY INDICATE START OF WDT WITH WATCH DOG TIMER
03 ; OCCURRED.
04 ;
05 ; 10.5.1 "SUCCESS END OF PART ONE" THIS MEANS THAT BOTH
06 ; WATCH DOG TIMERS (MASTER & SLAVE) HAVE BEEN TURNED ON
07 ; AND ARE CORRECTLY SERVICING THEIR RESPECTIVE DOG TIMERS.
08 ;
09 ; 10.5.2 "POWER FAIL ON COMM CHASIS" INDICATES THAT WATCH
10 ; DOG TIMER DETECTED ITS POWER FAIL BIT SET
11 ;
12 ; 10.5.3 "BAD DONE SET" THIS INDICATES THAT THE WDT WAS
13 ; EXPECTED TO SET DONE AND SOMETHING ELSE DID.
14 ;
15 ; 10.5.4 "WRONG TYPE DONE SET ON WDT" THIS INDICATES THAT
16 ; WDT WAS EXPECTING A RECEIVE DONE AND GOT A TXDONE OR
17 ; VICE-VERSA. THE PROGRAM HANDLES DONE CORRECTLY.
18 ;
19 ; 10.5.5 "DONE NOT SET IN TIME" INDICATES NO DONE SET AFTER
20 ; WATCH DOG TIMER SHOULD HAVE BEEN TURNED ON.
21 ;
22 ; 10.5.6 "UNKNOWN BIT SET IN WDT STATUS" THIS INDICATES THAT
23 ; AN ERROR BIT WAS DETECTED BY WATCH DOG TIMER BUT WAS NOT
24 ; ONE OF THE 4 KNOWN ONES.
25 ;
26 ; 10.5.7 "OPPOSITE WATCH DOG TIMER OFF" THIS INDICATES THAT
27 ; THE OPPOSITE DOG TIMER HAS NOT BEEN TURNED ON.
28 ;
29 ; 10.5.8 "DATA ERROR ON OPP WATCH DOG TIMER" & TIME OUT
30 ; ERROR ON OPP WATCH DOG TIMER INDICATES JUST THAT.
```

!0010 PMUXR

01 ;10.6 THE FOLLOWING MESSAGES REFER TO MODE (D)
02 ; (FULL DUAL PORT)
03 ;
04 ; 10.6.1 "HALT COMM LINK DONE IN ERROR" INDICATES
05 ; DCU PROGRAM HALTED BECAUSE THE COMM LINE GOT A DONE
06 ; WHEN IT SHOULD NOT HAVE
07 ;
08 ; 10.6.2 "HALT CHECKSUM ERROR" INDICATES THAT A BIT
09 ; OR BITS WAS DROPPED OR ADDED WHEN COMM LINE WAS BEING
10 ; USED TO TRANSMIT LINE CONTROL BLOCK DATA FROM MASTER
11 ; TO SLAVE.
12 ;
13 ; 10.6.3 "COMM LINK DATA ERROR GOOD BAD DATA TO FOLLOW"
14 ; INDICATES THAT COMM LINK FAILED WHILE SENDING SPECIFIC
15 ; PATTERN FROM MASTER TO SLAVE AND BACK
16 ;
17 ; 10.6.4 "PREVIOUS ERROR ON COMM LINK" INDICATES THAT DATA ERROR
18 ; OCCURRED PREVIOUSLY.
19 ;
20 ; 10.6.5 "NO. OF MODULES ASSIGNED IS..."
21 ; "NO. OF LINES ASSIGNED IS..." THIS INDICATES THE
22 ; LINES AND MODULES ASSIGNED TO EACH SIDE IN MODE D
23 ; OR TO ONE SIDE IN MODE C. AS LINES ARE SWAPPED BE-
24 ; TWEEN PROCESSORS THIS IS UPDATED.
25 ;
26 ; 10.6.6 "END OF PART FOUR" INDICATES ALL LINE MODULES
27 ; HAVE BEEN SWAPPED FROM ONE PROCESSOR TO THE OTHER
28 ; AND BACK AGAIN.
29 ;
30 ; 10.6.7 "NO. OF PASSES COMPLETED IS..." THIS INDICATES
31 ; THE NUMBER OF TIMES PART 4 & 5 HAVE BEEN CYCLED.

01 ;11.0 MISCELLANEOUS
02
03 ;11.1 MODEM CONTROL TEST PLUG CONNECTS:
04 ; ASYNC (PTI) SYNC (PSI)
05 ;
06 ; RTS X TO RING X AND DSR X+1 DTR TO RING
07 ; RTS X+1 TO RING X+1 AND DSR X RTS TO DSR
08 ; DTR X TO CTS X AND CD X+1 SPA TO CD
09 ; DTR X+1 TO CTS X+1 AND CD X SPB TO CTS
10 ;
11 ; X= ANY EVEN NUMBERED LINE
12 ;
13 ;11.2 TO AID IN TROUBLE SHOOTING, EXAMINE THE LCB'S FOR
14 ; THE FAILING LINE(S) FOR ADDITIONAL INFORMATION. TO
15 ; FIND THE APPROPRIATE LCB STARTING ADDRESS, ADD THE LINE
16 ; NUMBER TO LCBPTR AND EXAMINE THAT LOCATION. A DESCRIP-
17 ; TION OF LCB WORDS IS FOUND IN 11.9.
18 ;
19 ;11.3 THE RELIABILITY OF THE DCU SHOULD BE ESTABLISHED
20 ; BEFORE THIS PROGRAM IS RUN.
21 ;
22 ;11.4 A PERIODIC PRINTOUT OF THE ACCUMULATED TRANSMIT AND
23 ; RECEIVED WORDS IS PROVIDED AFTER EACH PASS. THESE
24 ; NUMBERS ARE JUST AN INDICATION THAT ACTIVITY IS
25 ; TAKING PLACE, AND SHOULD BE APPROXIMATELY EQUAL
26 ; (WITHIN ONE ORDER OF MAGNITUDE).
27 ;
28 ;11.5 AN "OVERRUN" OR "RECEIVE BUFFER OVERFLOW" ERROR
29 ; PRINTOUT MAY BE AN INDICATION THAT THE THROUGHPUT
30 ; OF THIS PROGRAM (APPROXIMATELY 10000 CPS, FULL
31 ; DUPLEX) IS BEING EXCEEDED. IT MAY BE NECESSARY
32 ; ON A LARGE NUMBER OF HIGH BAUD RATE LINES (>4800)
33 ; TO TEST SMALLER GROUPS OF LINES AT A TIME, FORCE A
34 ; LOWER BAUD RATE (STARTING ADDRESS =4) FOR THE ASYNC
35 ; LINES, OR CHANGE BAUD RATE JUMPERS.
36 ;
37 ;11.6 A MAXIMUM TIME COUNTER IS PROVIDED TO DETECT A LOSS
38 ; OF ACTIVITY ON A LINE (BLOCK DONE NEVER SETS AFTER
39 ; STARTING). FOR EXCEEDINGLY LOW BAUD RATES (<<100) ON
40 ; A SMALL NUMBER OF LINES (4 OR LESS), THE TIME COUNT
41 ; (TIMEX) SHOULD BE INCREASED, IF "LOSS OF LINE
42 ; ACTIVITY" ERROR MESSAGES APPEAR.
43 ;
44 ;11.7 THE RANDOM NUMBERS ARE TRANSMITTED IN BLOCKS AT
45 ; A TIME AND COMPARED IN NON-INTERRUPT TIME. THE
46 ; TRANSMIT/RECEIVE BUFFER AREAS ARE DIVIDED
47 ; ACCORDING TO HOW MANY LINES ARE ACTIVE- THEN EACH
48 ; LINE IS GIVEN A RANDOM BLOCK LENGTH EVERY TIME
49 ; A NEW BLOCK IS SENT, WITHIN THE CONSTRAINTS OF THE
50 ; MAXIMUM BLOCK SIZE. TO TRANSMIT LARGER BLOCKS
51 ; OF CHARACTERS AT A TIME, THE OPERATOR MAY WANT TO
52 ; SELECT FEWER LINES TO ACTIVATE.

```

01      ;11.8  DESCRIPTION OF COMMUNICATION SYSTEM I/O FUNCTIONS:
02      ;
03      ;      DEVICE CODES MUX = 34 (OCTAL)
04      ;      CRC = 35 (OCTAL)
05      ;
06      ;
07      ;      DOR AC, MUX      SPECIFIES THE ABSOLUTE LINE ADDRESS TO
08      ;      BE USED IN CONJUNCTION WITH A DATA OUT
09      ;      INSTRUCTION TO TRANSMIT, RECEIVE, OR
10      ;      MODEM.
11      ;
12      ;      BITS 0-6      NOT USED
13      ;
14      ;      BITS 7-14     ABSOLUTE LINE ADDRESS
15      ;
16      ;      0=RECEIVE OR MODEM CONTROL
17      ;      1=TRANSMIT CONTROL
18      ;
19      ;      DOB AC, MUX     SPECIFIES TRANSMIT DATA, TRANSMIT MODE
20      ;      (TRANSPARENT OR BREAK), AND MODEM OUT.
21      ;
22      ;      BITS 0-1      TRANSMIT OR MODEM CONTROL
23      ;      10=MODEM CONTROL
24      ;      00=NORMAL TRANSMIT DATA
25      ;      01=TRANSMIT BREAK (ASYNC ONLY)
26      ;
27      ;      BITS 2-3     TRANSPARENCY CONTROL (SYNC ONLY)
28      ;
29      ;      00=NORMAL TRANSMIT
30      ;      10=TRANSMIT AND LEAVE XPARENT
31      ;      11=TRANSMIT AND ENTER XPARENT
32      ;
33      ;      BITS 4-7     NOT USED
34      ;
35      ;      BITS 8-15    TRANSMIT DATA (IN TRANSMIT MODE)
36      ;
37      ;
38      ;      MODEM CONTROL SIGNALS
39      ;
40      ;      BIT 12      1=TURN ON SPA (SYNC ONLY)
41      ;      0=TURN OFF SPA (SYNC ONLY)
42      ;
43      ;      BIT 13      1=TURN ON SPB (SYNC ONLY)
44      ;      0=TURN OFF SPB (SYNC ONLY)
45      ;
46      ;      BIT 14      1=TURN ON RTS
47      ;      0=TURN OFF RTS
48      ;
49      ;      BIT 15      1=TURN ON DTR
50      ;      0=TURN OFF DTR

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!0013 PMUXR

01	;	DOC AC, MUX	SPECIFIES ON/OFF CONTROL OF TRANSMITTER
02	;		OR RECEIVER, OUTPUT SYNC AND DLE CHARAC-
03	;		TERS (SYNC ONLY), AND LINE CHARACTER-
04	;		ISTICS.
05	;		
06	;		
07	;	BITS 0-1	00=XMIT/RECV CONTROL
08	;		
09	;	BITS 2-14	NOT USED
10	;		
11	;	BIT 15	0=OFF
12	;		1=ON
13	;		
14	;		
15	;	BITS 0-1	01=SYNC CHARACTER (SYNC ONLY)
16	;		
17	;	BITS 2-7	NOT USED
18	;		
19	;	BITS 8-15	SYNC CHARACTER
20	;		
21	;		
22	;	BITS 0-1	11=DLE CHARACTER (SYNC ONLY)
23	;		
24	;	BITS 2-7	NOT USED
25	;		
26	;	BITS 8-15	DLE CHARACTER

01	:	DOC AC MUX (CONTINUED)	
02	:		
03	:	BITS 0-1	10 SPECIFIES PARITY, STOP BITS,
04	:		LINE SPEED, CHAR CODE LEVEL, AND
05	:		LOOPBACK CONTROL.
06	:		
07	:	BITS 2-5	NOT USED
08	:		
09	:	BIT 6	SELECT ONE OF TWO POLYNOMIALS
10	:		(SYNC ONLY)
11	:		
12	:	BITS 7-8	CLOCK SELECT (ASYNC ONLY)
13	:		
14	:		00 = CLOCK 0
15	:		01 = CLOCK 1
16	:		10 = CLOCK 2
17	:		11 = CLOCK 3
18	:		
19	:	BITS 9-10	SPECIFY NUMBER OF STOP BITS
20	:		(ASYNC ONLY)
21	:		
22	:		00 = 1 STOP BIT
23	:		01 = 2 STOP BITS
24	:		10 = RESERVED
25	:		11 = RESERVED
26	:		
27	:	BITS 11-12	SPECIFY CODE LEVEL
28	:		
29	:		00 = 5 LEVEL CODE (ASYNC ONLY)
30	:		01 = 6 LEVEL CODE
31	:		10 = 7 LEVEL CODE
32	:		11 = 8 LEVEL CODE
33	:		
34	:	BITS 13-14	PARITY SELECT
35	:		
36	:		00 = NO PARITY
37	:		01 = ODD PARITY
38	:		10 = EVEN PARITY
39	:		11 = RESERVED
40	:		
41	:	BIT 15	LOOPBACK CONTROL
42	:		
43	:		0 = LOOPBACK OFF
44	:		1 = LOOPBACK ON

!0015 PMUXR

```

01 ; DIA AC, MUX SPECIFIES IMPLICIT ADDRESS OF INT-
02 ; ERRUPTING LINE, RECEIVE, MODEM, OR
03 ; TRANSMIT, AND FORCES A DDA AS EXPLICIT
04 ; ADDRESS FOR OUTPUTTING.
05 ;
06 ;
07 ; BITS 0-6 NOT USED
08 ;
09 ; BITS 7-14 EXPLICIT ADDRESS
10 ;
11 ; BIT 15 TRANSMIT OR RECV/MODEM CONTROL
12 ;
13 ; 0= RECEIVE OR MODEM INTERRUPT
14 ; 1= TRANSMIT INTERRUPT
15 ;
16 ;
17 ; DIB AC, MUX SPECIFIES RECEIVED DATA ON RECEIVE INT-
18 ; ERRUPT.
19 ;
20 ; BITS 0-7 NOT USED
21 ;
22 ; BITS 8-15 RECEIVE DATA
23 ;
24 ;
25 ; DIC AC, MUX SPECIFIES RECEIVER DONE/STATUS OR
26 ; MODEM DONE/STATUS
27 ;
28 ; BITS 0-11 NOT USED
29 ;
30 ;
31 ; RECEIVER STATUS
32 ;
33 ; BIT 12 FRAMING ERROR (ASYNC ONLY)
34 ;
35 ; BIT 13 PARITY ERROR
36 ;
37 ; BIT 14 OVERRUN
38 ;
39 ; BIT 15 0=RECEIVER STATUS

```

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01 ;
02 ;
03 ;
04 ;
05 ;
06 ;
07 ;
08 ;
09 ;
10 ;
11 ;
12 ;
13 ;
14 ;
15 ;
16 ;
17 ;
18 ;
19 ;
20 ;
21 ;
22 ;
23 ;
24 ;
25 ;
26 ;
27 ;

DIC AC, MUX (CONTINUED)

MODEM STATUS

BIT 11 CD STATUS
1=CD IS ON
0=CD IS OFF
BIT 12 CTS STATUS
1=CTS ON
0= CTS OFF
BIT 13 DSR STATUS
1= DSR ON
0= DSR OFF
BIT 14 RING STATUS
1= RING ON
0= RING OFF
BIT 15 MODEM STATUS CONTROL
1= MODEM STATUS

01 ; EFFECT OF 'BUSY' AND 'DONE' ON COMMUNICATIONS CONTROL
02 ;
03 ;
04 ; BUSY: BUSY IS SET ON THE ASYNC LINES ON AN I/O RESET
05 ; OR START PULSE. THIS STARTS AN ICLR CYCLE WHICH
06 ; CLEARS MODEM MEMORY AND PRESETS THE IMPLIED ADD-
07 ; RESS COUNTER. ON COMPLETION OF THE ICLR CYCLE,
08 ; BUSY RESETS, AND THE BOARD IS PLACED IN THE
09 ; 'DIAGNOSTIC' MODE. THERE IS NO 'BUSY' FLOP
10 ; ON SYNC LINES.
11 ;
12 ; DONE: DONE SETS ON BOTH SYNC AND ASYNC LINES WHEN ONE
13 ; OF THE FOLLOWING EVENTS OCCURS:
14 ; 1. CHARACTER RECEIVED.
15 ; 2. TRANSMIT BUFFER EMPTY
16 ; 3. MODEM STATUS HAS CHANGED.
17 ; INTERRUPTS OCCUR IN THE ABOVE ORDER OF PRIORITY,
18 ; AND FROM LOWEST TO HIGHEST NUMBERED LINES. A
19 ; 'NIOC MUX' WILL CLEAR DONE, AS WELL AS A
20 ; 'NIOB MUX' AND 'IORST'.
21 ;
22 ; IORESET: CLEARS LOGIC AND PLACES CONTROLLERS IN OFFLINE
23 ; DIAGNOSTIC MODE. ALSO SETS 'BUSY' (ASYNC ONLY).
24 ;
25 ; START: SAME AS IORESET (SELECTIVE ON PER CARD BASIS).
26 ;
27 ; CLEAR: CLEARS 'DONE' AND INTERRUPT LOGIC AND PLACES
28 ; CONTROLLERS IN ONLINE MODE.
29 ;
30 ; IOPLS(MUX): STEPS INTERNAL CLOCKS IN
31 ; 'DIAGNOSTIC' MODE.
32 ;
33 ; IOPLS(CRC): STEPS TRANSMIT/RECEIVE CLOCK AND CRC
34 ; CLOCK IN 'DIAGNOSTIC MODE'
35 ; (SYNC ONLY).

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01 ;11.9 FORMAT OF PROGRAM INTERNAL CONTROL WORDS (LCB BLOCKS)
02 ;
03 ;     MASTER CONTROL WORD (MCW)
04 ;
05 ;     BIT 0     LINE ACTIVE
06 ;
07 ;     BIT 1     LINE SHOULD BE STARTED (DCU OR MONITOR
08 ;               PROGRAM)
09 ;
10 ;     BITS 2-7  TIME OUT COUNTER FOR XMIT OR RECEIVE INTR.
11 ;
12 ;     BITS 8-9  IN DUAL PORT INDICATES FIRST MIDDLE OR LAST LINE
13 ;               ADDRESS ACCORDING TO THE FOLLOWING TABLE.
14 ;               BITS      BIT9
15 ;               1         1   FIRST LINE
16 ;               1         0   MIDDLE LINE(S)
17 ;               0         1   LAST LINE
18 ;
19 ;     BITS 10-13 NOT USED
20 ;
21 ;     BIT 14    BLOCK IS READY FOR CHECKING (BLOCK DONE)
22 ;
23 ;     BIT 15    0=ASYNC LINE
24 ;               1=SYNC LINE
25 ;
26 ;
27 ;     CONTROL REGISTER (CONT)
28 ;
29 ;     BIT 0     ERROR OCCURRED
30 ;
31 ;     BIT 1     USER SELECTED DATA LOADED
32 ;
33 ;     BITS 2-5  NOT USED
34 ;
35 ;     BIT 6     CRC POLYNOMIAL FOR THIS LINE (SYNC ONLY)
36 ;
37 ;     BITS 7-8  CLOCK SELECT (ASYNC ONLY)
38 ;
39 ;     BIT 9     NOT USED
40 ;
41 ;     BIT 10    STOP BITS (ASYNC ONLY)
42 ;
43 ;     BITS 11-12 CODE LEVEL
44 ;
45 ;     BITS 13-14 PARITY
46 ;
47 ;     BIT 15    CRC OPTION (SYNC ONLY)

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!0019 PMUXR

01	;		MODEM OUTPUT REGISTER (MOD)
02	;		
03	;	BIT 0	MODEM ACTIVE
04	;		
05	;	BIT 1	OUTPUT NEW MODEM STATUS
06	;		
07	;	BITS 2-11	NOT USED
08	;		
09	;	BITS 12-15	NEW MODEM STATUS TO BE OUTPUTTED
10	;		
11	;		
12	;		MODEM REGISTER (MODS)
13	;		
14	;	BIT 0	NEW MODEM STATUS HAS BEEN RECEIVED
15	;		
16	;	BITS 1-3	NOT USED
17	;		
18	;	BITS 4-7	OLD (PREVIOUS) MODEM STATUS
19	;		
20	;	BITS 8-11	NOT USED
21	;		
22	;	BITS 12-15	NEW (PRESENT) MODEM STATUS

!0020 PMUXR

01	;		TRANSMIT TABLE POINTER (XTP)
02	;		
03	;	BITS 0-15	STARTING ADDRESS OF TRANSMIT BLOCK
04	;		FOR THIS LINE
05	;		
06	;		
07	;		TRANSMIT TABLE SIZE (XTS)
08	;		
09	;	BITS 0-15	NUMBER OF CHARACTERS IN BLOCK TO
10	;		BE TRANSMITTED
11	;		
12	;		
13	;		TRANSMITTED WORD COUNT (XC)
14	;		
15	;	BITS 0-15	NUMBER OF CHARACTERS IN BLOCK
16	;		ALREADY TRANSMITTED
17	;		
18	;		
19	;		RECEIVE TABLE POINTER (RTP)
20	;		
21	;	BITS 0-15	STARTING ADDRESS OF RECEIVE BLOCK
22	;		FOR THIS LINE
23	;		
24	;		
25	;		
26	;		RECEIVE TABLE SIZE (RTS)
27	;		
28	;	BITS 0-15	MAXIMUM ALLOWABLE NUMBER OF
29	;		RECEIVE WORDS (2*XTS)
30	;		
31	;		
32	;		
33	;		RECEIVED WORD COUNT (RC)
34	;		
35	;	BITS 0-15	NUMBER OF CHARACTERS RECEIVED
36	;		IN THIS BLOCK

01	;		SYNC WORD (SYNC)
02	;		
03	;	BITS 0-7	NOT USED
04	;		
05	;	BITS 8-15	SYN CHARACTER
06	;		
07	;		
08	;		
09	;		DLE WORD (DLE)
10	;		
11	;	BITS 0-7	NOT USED
12	;		
13	;	BITS 8-15	DLE CHARACTER
14	;		
15	;		
16	;		
17	;		CRC TEMPORARY (SCRC)
18	;		
19	;	BITS 0-15	PRESENT CRC TEMPORARY
20	;		
21	;		
22	;		
23	;		TIME COUNTER (TIME)
24	;		
25	;	BITS 0-15	RTC READING AT LAST BLOCK DONE
26	;		IF DCU SYSTEM, ELSE NUMBER
27	;		OF TIMES THROUGH MONITOR ROUTINE
28	;		
29	;		
30	;		
31	;		TRANSMIT WORD TABLE (XTBL)
32	;		
33	;	BIT 0	NOT USED
34	;		
35	;	BIT 1	UNDERRUN FOR THE REST OF THE BLOCK SIZE
36	;		
37	;	BIT 2	DLE CHARACTER FOLLOWS
38	;		
39	;	BIT 3	0=LEAVE TRANSPARENCY
40	;		1=ENTER TRANSPARENCY
41	;		
42	;	BITS 4-7	NOT USED
43	;		
44	;	BITS 8-15	TRANSMIT DATA
45	;		
46	;		
47	;		
48	;		RECEIVE WORD TABLE (XTBL+BL)
49	;		
50	;		
51	;	BITS 0-3	NOT USED
52	;		
53	;	BITS 4-7	ERROR STATUS
54	;		
55	;	BITS 8-15	RECEIVE DATA WORD

!0022 PMUXR

01

02 ;12.0 SPECIAL FEATURES

03 ; NONE

04 ;

05 ;13.0 RUN TIME

06 ; RUN TIME IS DEPENDENT ON MODE OF OPERATION AND NUMBER

07 ; AND TYPE OF LINES BEING TESTED.

**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS