Model MX-352

Programmable Synchronous Interface

Technical Manual

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NOTICE

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REVISION HISTORY

ECO No.	Date	Description	Pages
0028	6/1/82	Per ECO	1-1
0047	8/23/82	Per ECO	6-1
0328	6/28/84	New ZETACO Cover	
0523	3/3/86	New Cover	

CUSTOMER SUPPORT HOTLINE

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PRODUCT RETURN AUTHORIZATION

All possible effort to test a suspected malfunctioning controller should be made before returning the controller to ZETACO for repair. However, if controller or module malfunction has been confirmed, you should return the part to ZETACO. If the part is no longer under warranty, or if the problem is not warranted, then repair will be on a time-and-material basis. A Return Material Authorization (RMA) number is required before shipment and should be referenced on all packaging and correspondence.

To ensure prompt response, the information outlined in the Material Return Information form on the following page should be gathered before calling the ZETACO Hotline for the RMA number. Please include a completed copy of the Material Return Information form with the product. Each product to be returned requires a separate RMA number and Material Return Information form.

To safeguard the product 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 ZETACO, Inc. for repair. The speed and accuracy of a product's repair is often dependent upon a complete understanding of the user's checkout test results, problem characteristics, and the user system configuration. Use the form below to record the results of your trouble-shooting procedures. If more space is needed, use additional sheets.

TEST	RESULT
PSI DIAG UMUX REL I (or 4243R)	_____ _____

Other tests performed:

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

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

2. Under what operating system are you running? (AOS, AOS/VS, RDOS, etc.)

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

4. Has the unit been returned before? Same problem?

To be filled out by CUSTOMER:

Model #: _____
Serial #: _____
RMA #: _____ (Call ZETACO to obtain an RMA number.)

Returned by:

Your name: _____
Firm: _____
Address: _____
_____
Phone: _____

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MODEL 352-ULM-5
PROGRAMMABLE SYNCHRONOUS INTERFACE (PSI/U)

1.0 INTRODUCTION

The 352-ULM-5 Programmable Synchronous Interface is a single line communications controller designed to provide half or full duplex synchronous communications control for a Data General Nova* or Eclipse* based computer system. Its programming format is fully compatible with Data General's Model 4242 ULM/5 Sync Controller.

Features of the PSI/U include: Programmable Line Characteristics (word length, parity type, SYN character, DLE character), Full Modem Control, 600-38.4K Baud Internal Clock and On-Board Cyclic Redundancy Check (CRC).

The controller PC board occupies one slot in the CPU Chassis.

*Nova and Eclipse are registered 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 ZETACO, 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 the PSI is to be installed in.

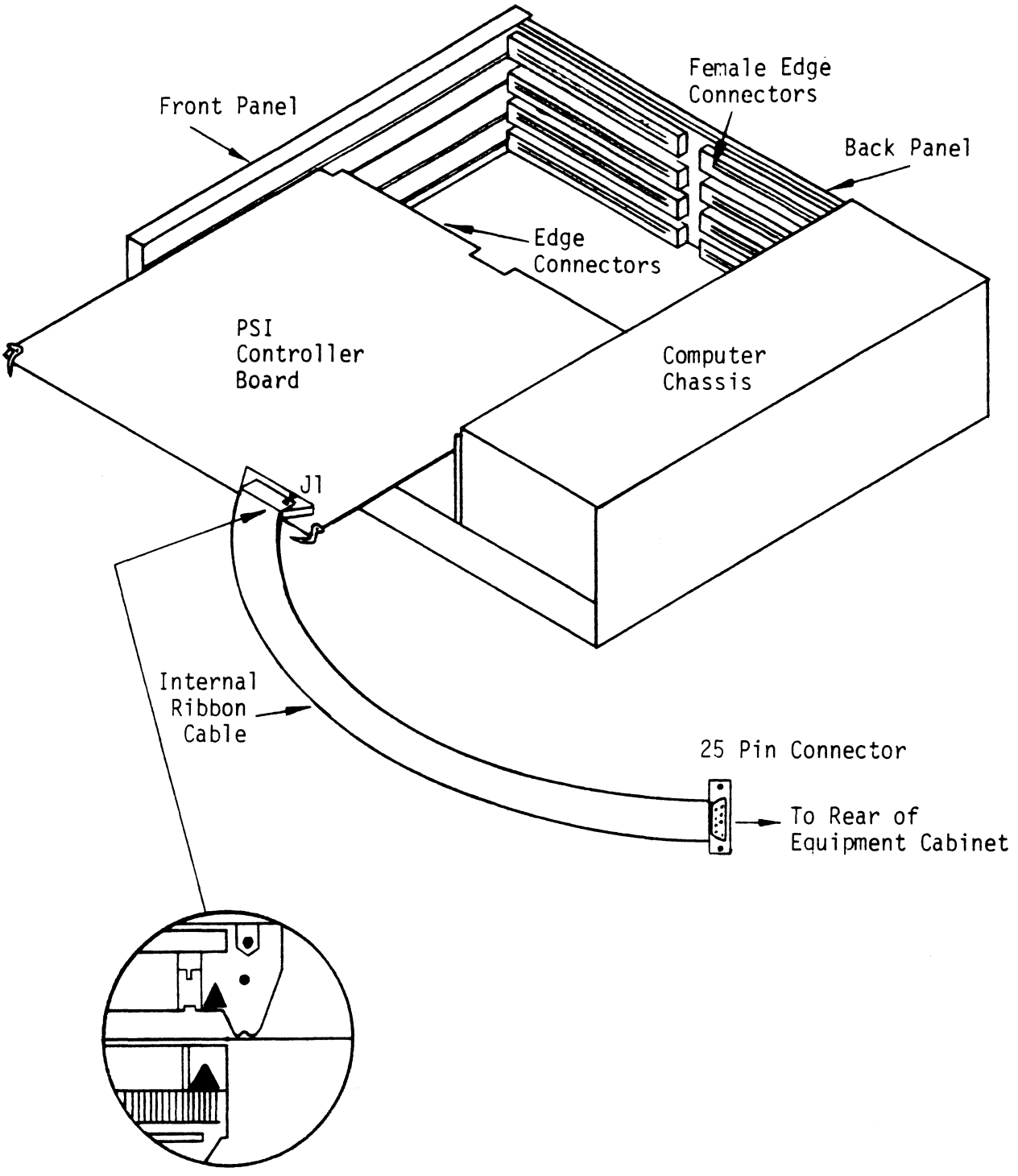


FIGURE 2.1 BOARD AND CABLE INSTALLATION

2.3 CABLES (refer to Figure 2.1)

Ribbon cables provide communication interfacing for PSI. The cable plugs into the 26-pin header located on the front edge of the controller board.

NOTE: When plugging the connector in, be sure to line up the arrows on the connector and header to assure proper connections.

The ribbon cable should then be pulled through to the back of the computer equipment cabinet. An external cable may then be connected to the 25S connector of the ribbon cable and secured using the jack screws.

When installation is complete, the ribbon cable should be secured to the computer chassis.

2.4 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 contacts of these connectors protrude through the back panel 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).

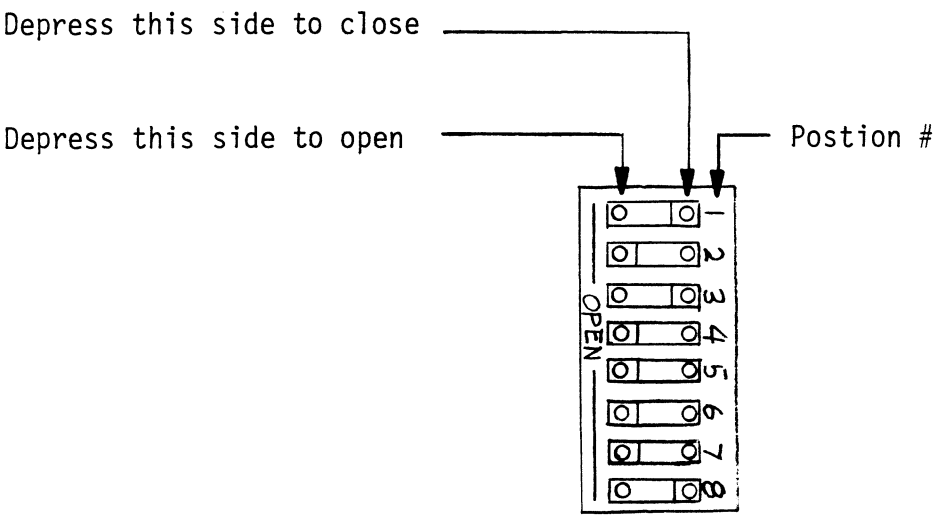
BACK PANEL NUMBERING

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

3.0 CONFIGURATION

Device codes, line address, local clock speed, and +12 Volt power source are selectable and should be checked and configured per system requirements before installation. To do this, the board cover must be removed.

Switch functions are indicated near the switches. Each switch consists of eight individual switches numbered 1-8 (see below). Jumpers are also used and are "IN" if the foil is not cut or a wire is in its place. Jumpers are "OUT" if the foil is cut or wire removed. Use 24 gauge solid insulated wire for jumper replacement.



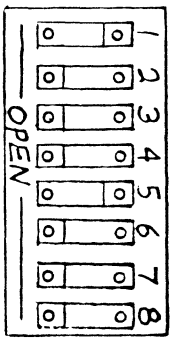
Switch is shown with Positions 1, 3 and 8 closed;
all other Positions are open.

3.1 DEVICE CODE SELECTION

The line sections and the CRC sections of the PSI board are accessed via two separate device codes. Mnemonics are MUX and CRC. The MUX is always an even device code and CRC is always the next higher consecutive odd device code. Primary device codes for MUX and CRC are 34_8 and 35_8, respectively, and secondary device codes are 44_8, 45_8. The device code select switch, however, allows the user to select any pair of consecutive device codes. Refer to the figure below to set the desired device code.

NOTE: The switches must be set to the MUX (even) device code.

DEVICE CODE SELECT SWITCH (location X-2)



SW1 = DSØ
SW2 = DS1
SW3 = DS2
SW4 = DS3
SW5 = DS4
SW6 = Not Used
SW7 = Not Used
SW8 = Not Used

Open = Logic "1"
Closed = Logic "Ø"

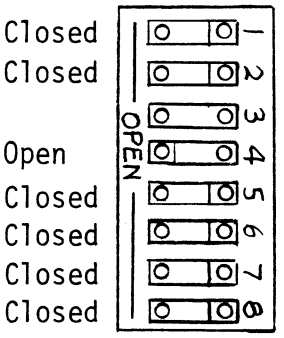
SHOWN:
Device codes 34_8 (MUX) and 35_8 (CRC) selected.

3.2 LINE ADDRESS SELECTION

The PSI/U uses one of two possible line addresses. They are 10_8 and 14_8.

Postition 3 of the line address switch is used to select between these two addresses (see below). In addition, the other switch positions must be set as shown below, with position 4 open and all others closed.

Line Address Switch (Location W-4)

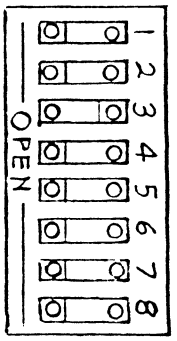


Position 3: Closed = Line Address 10_8
Open = Line Address 14_8

3.3 LOCAL CLOCK SPEED SELECTION

Timing for transmitting and receiving synchronous information is usually provided to the PSI by the modem unit. However, an on-board local clock is provided on the PSI board and may be used for timing if externally clocked modems are used, or if a data link is made without modems. Baud rates are available from 600 to 38.4K baud, and are selectable using the Local Clock switch. (see below) Local clock signals are not connected internally. They must be looped back; this is usually done through the modem, but may require special cabling considerations for direct data links. (see Section 6.1.2)

LOCAL CLOCK SWITCH (location C-9)



SW1 = 38.4K Baud
SW2 = 19.2K Baud
SW3 = 9.6K Baud
SW4 = 4.8K Baud
SW5 = 2.4K Baud
SW6 = 1.2K Baud
SW7 = 600 Baud
SW8 = Not Used

NOTE: Close switch to select rate; only one switch may be closed at a time.

SHOWN:
9.6K Baud

3.4 +12 VOLT POWER SOURCE

The PSI requires +12 Volts for proper operation of the RS-232C driver chips. The source of the +12V depends on the machine being used. On older machines (Nova 1200, 2, 3 etc.),the +12V is regulated down from +15V (VINH - pin A10). In a newer machine (Nova 4, Eclipse S140), +12V is available on backplane pin B90. Jumpers J2-1 and J2-2 (located near chip loc A10) are used to select between the two sources.

- The PSI is factory set for +15V to +12V regulation, as used with a Nova 1200, 2, 3, etc. J2-2 is IN and J2-1 is OUT, or cut.

- To change the configuration for use with a +12V source, cut or remove jumper J2-2, and insert a 24 gauge wire into jumper J2-1.

4.0 OPERATION

Each line of the Programmable Synchronous Interface consists of Receiver, Transmitter, and Modem Control sections. Each section may set the Done Flag if it is enabled and requires service.

If more than one section is requesting service at the same time, the section of highest priority will be serviced first. The receiver section has higher priority than the transmitter section, which in turn has higher priority than the modem control section. (See Below)

Receiver - Highest Priority
Transmitter -
Modem Control - Lowest Priority

Also on the PSI controller is the CRC generator/checker, used by the receiver and transmitter sections. The CRC section uses the next higher device code than that of the other sections. The Busy Flag is active while the CRC is performing a calculation.

The PSI operates in two modes - Offline (diagnostic) and Online (normal). In Offline mode the program provides timing pulses for onboard counters and sequenced logic via I/O Pulse commands. In normal mode, timing is provided by the onboard oscillator.

4.1 DONE, BUSY AND DEVICE FLAG COMMANDS

Mnemonics for PSI programming are MUX and CRC, with MUX commands controlling receiver, transmitter, and modem control sections, and CRC commands controlling the CRC section. Start and Clear commands are meaningless unless the board is enabled. This may be done with a Set Line and Section (DOA) instruction.

Done, Busy and Device Flag commands for the MUX sections are:

Busy Flag	-	Not used
Done Flag	-	Active whenever an enabled line section of the board requires service.
F=S	-	Start pulse - clears all done flags on board, puts all sections of board offline except local clock and CRC timing clock (if online), and initializes board logic.
F=C	-	Clear pulse - clears done Flags of board and current line section, and puts all sections of board online.
F=P	-	I/O pulse - steps internal control clock if in offline mode; has no effect in online mode.

Done, Busy and Device Flag commands for the CRC section are:

Busy Flag	-	Active while CRC is performing a calculation.
Done Flag	-	Not used
F=S	-	Start pulse - starts CRC calculation
F=C	-	Clear pulse - clears CRC logic and partial result register.
F=P	-	I/O pulse - steps local clock and CRC timing clock if in offline mode; has no effect in online mode.

4.1 DONE, BUSY AND DEVICE FLAG COMMANDS (cont.)

I/O Reset - Same as start command to MUX, however goes to all boards in chassis. (same as power on). Also puts local clock and CRC timing clock in offline mode.

4.2 INITIALIZATION AND SETUP

The PSI is initialized by an I/O Reset instruction. A start MUX command may be used if the board is first enabled with a Set Line and Section (DOA) instruction. Logic is initialized, Done Flags cleared, and the board is placed in offline mode. All receiver and transmitter sections will be turned off, modem control sections will be turned on, and transmitters will be set for non-transparent operation. Modem control output signals and line characteristics are not affected.

The Set Line and Section (DOA) instruction may then be used to select which line and section are current, or to which succeeding instructions will pertain to. This line/section remains current until set with another Set Line and Section instruction or a Read Line and Section Requesting Service (DIA) instruction.

The board may then be set up for operation by configuring each line with operating characteristics, each receiver with a SYN character, and each transmitter with SYN and DLE characters. Line characteristics must be specified prior to setting SYN and DLE characters to insure that proper parity is appended. The board is then placed online with a Clear MUX command, and the necessary line sections turned on with Control Line Section (DOC) instructions. The Modem Control and CRC sections may also require set up before operation is to begin.

4.3 RECEIVER

The receiver section of a line receives the synchronous data serially from the modem and assembles the data into characters which are then received (with parity) by the processor over the data bus. Following initialization and setup, the receiver is turned on with a Control Line Section (DOC) instruction. It then monitors the serial bit stream until it receives at least two successive SYN characters. It will then assemble the next non-SYN character and set Done. A Read Line and Section Requesting Service (DIA) instruction is executed to determine which line and section requested service. A ReadReceived Data (DIB) instruction will pass the character, right-justified onto the processor data bus. Parity is retained for CRC calculations.

Receiver errors (parity, overrun) may then be checked with a Read Receiver Status (DIC) instruction. This data, however, will only be valid if read after received data has been read from the receiver. If it is discovered that a modem section has requested service rather than the receiver, this data represents new modem status, and the data read from the receiver becomes invalid. After verification of receiver status, the program may issue a Start command to the CRC to calculate a new CRC word.

The program may change line characteristics (with the exception of word length) while the receiver is turned on.

4.4 TRANSMITTER

The transmitter section of a line handles the serialization of data to be passed to the modem. Following initialization and setup, the transmitter is turned on with a Control Line Section (DOC) instruction, after which

4.4 TRANSMITTER (cont.)

it will immediately set Done, indicating that it is ready to accept a character for transmission, and begin to underrun. The underrun consists of a series of SYN characters transmitted if the transmitter is in non-transparent mode or DLE character - SYN character pairs if transmission is in transparent mode.

Data may be transmitted via Transmit Data (DOB) instruction. When the transmitter is ready to accept another character, Done will set. A Data In-A is executed to determine which line/section requested service. The Done condition may be cleared by a NIOC or DOBC MUX instruction.

Bits 2 and 3 of the transmit data accumulator control the transmission mode, either non-transparent or transparent. If the mode of operation is changed, the transmitter will insert a DLE character before the transmitted data.

An inactive Clear to Send signal from the modem will cause transmission to cease and the output will be held in the mark state. When CTS becomes active transmission may resume. A Transmit Underrun Sequence (DOB) instruction causes the transmitter to underrun and inhibits Done from setting until another Transmit Data instruction.

4.5 MODEM CONTROL

If the board is online, the modem control section will set Done when any of the four status signals (Carrier Detect, Clear to Send, Data Set Ready and Ring Indicator) from the modem change state. The new status may be read and Done cleared with a Read Modem Status-clear (DIC-C) instruction.

4.5 MODEM CONTROL (cont.)

On PSI/U boards, changes in modem status may be inhibited from setting Done by turning the section off with a Control Modem Section (DOC) instruction.

Modem control output signals are set up or changed with a Set Modem Control Status (DOB) instruction. Programming of the modem control section may vary depending on the modem used. The modem user's manual should provide information on the functions of the control signals.

4.6 CRC

The CRC (cyclic redundancy check) generator/checker section is used to calculate a 16-bit word which assists in the detection of errors when a block of data is transferred over the synchronous line. The CRC section is placed online along with the rest of the board with a Clear MUX command, however, it can only be placed offline with an I/O Reset instruction. Once online, it must be cleared with a Clear CRC command before being used.

Whenever processor data is read from a receiver or sent to a transmitter, it is sent to the CRC section. A start CRC command will then cause a new CRC word to be calculated. Because the CRC section is used by each receiver and transmitter section it may be necessary to use the Read CRC Partial Result (DIB) and Load CRC Partial Result (DOB) instructions each time a different section is serviced, in order to maintain calculations. When re-loading a partial result, the CRC section must first be cleared with an NIOC or DIBC command.

4.7 LOOPBACK

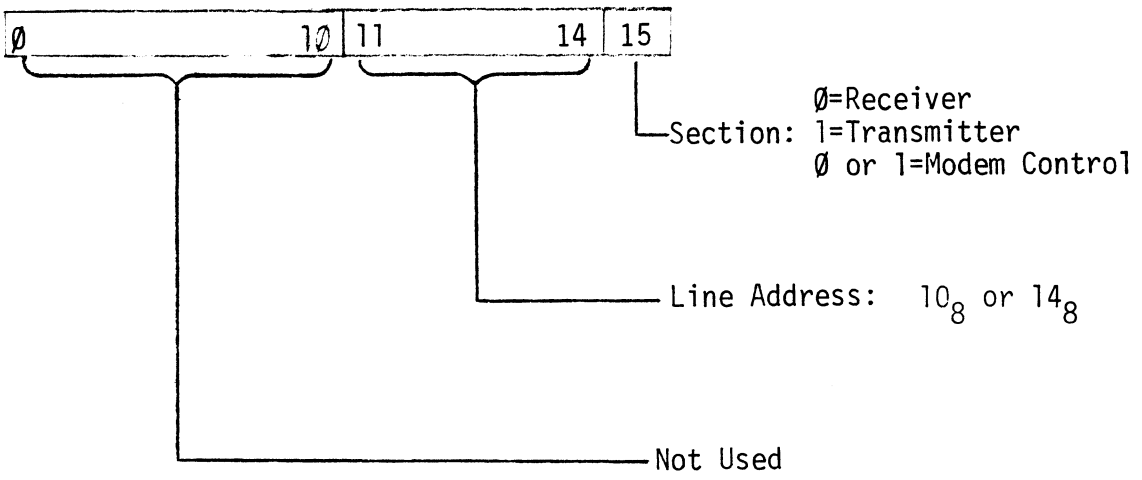
Either line may be placed in loopback mode with a Specify Line Characteristics (DOC) instruction. Loopback mode provides for the testing of each line by connecting the transmitted data path to the received data input. The local clock is used for all timing and Clear to Send is forced active.

For normal operation, loopback mode must be off.

5.0 PROGRAMMING NOTES

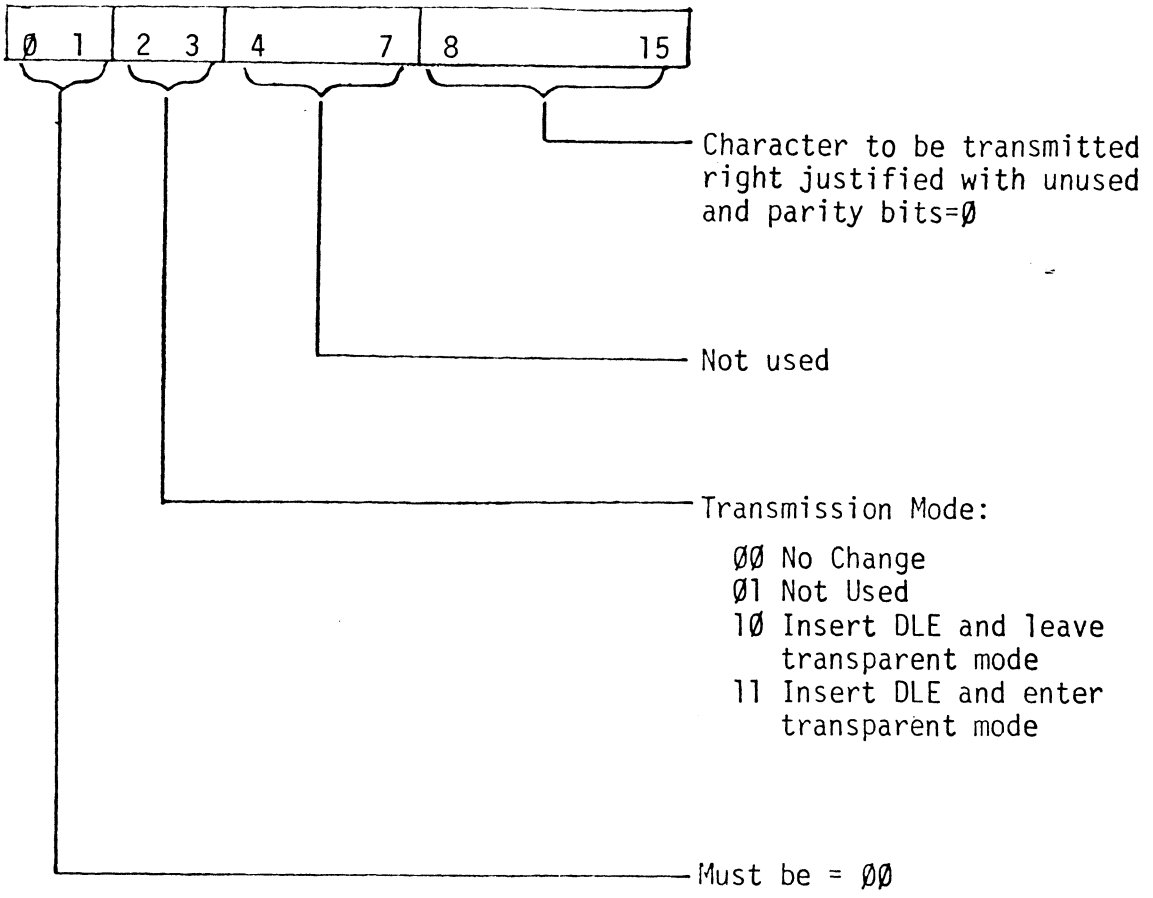
The PSI/U controller responds to fifteen instructions which control the various functions of synchronous communications. Some instructions are used more than once, with AC bits Ø, 1, 2 and 15 determing the specific function. All instructions apply only to the currect line address once it has been established with a Data Out-A or Data In-A. Mask bit for MUX is 8. The instructions are as follows:

1) Set Line and Section
   DOA (f) AC, MUX



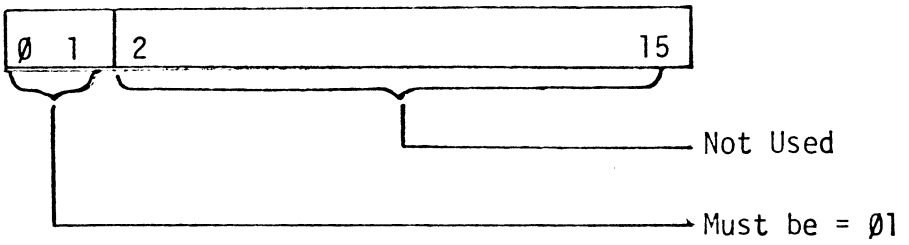
5.0 PROGRAMMING NOTES (cont.)

2) Transmit Data
DOB (f) AC, MUX

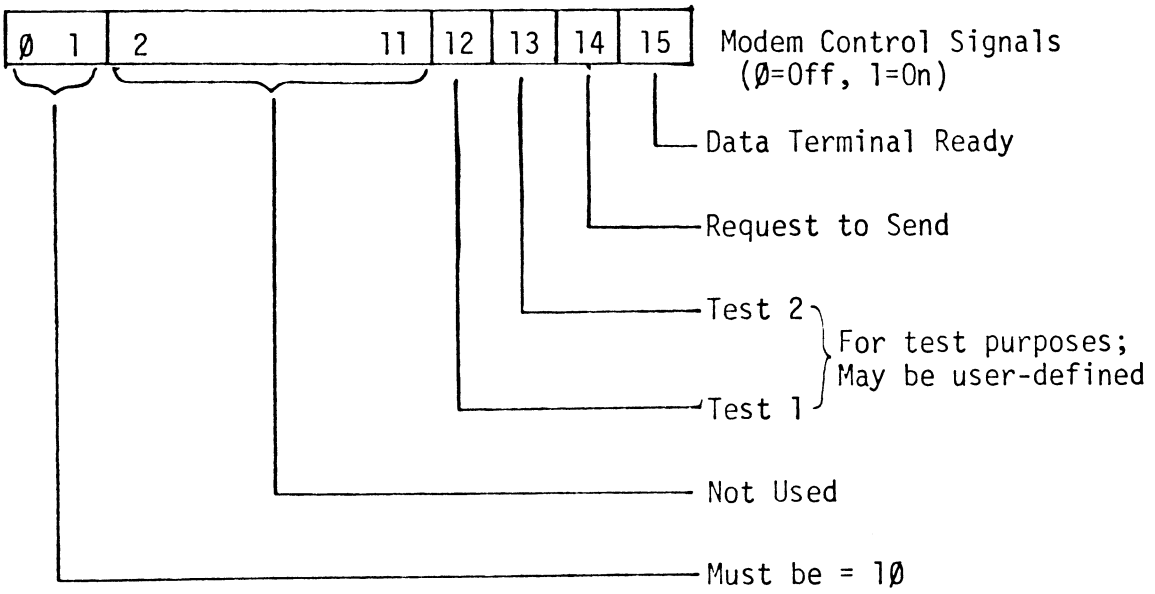


5.0 PROGRAMMING NOTES (cont.)

3) Transmit Underrun Sequence
DOB (f) AC, MUX

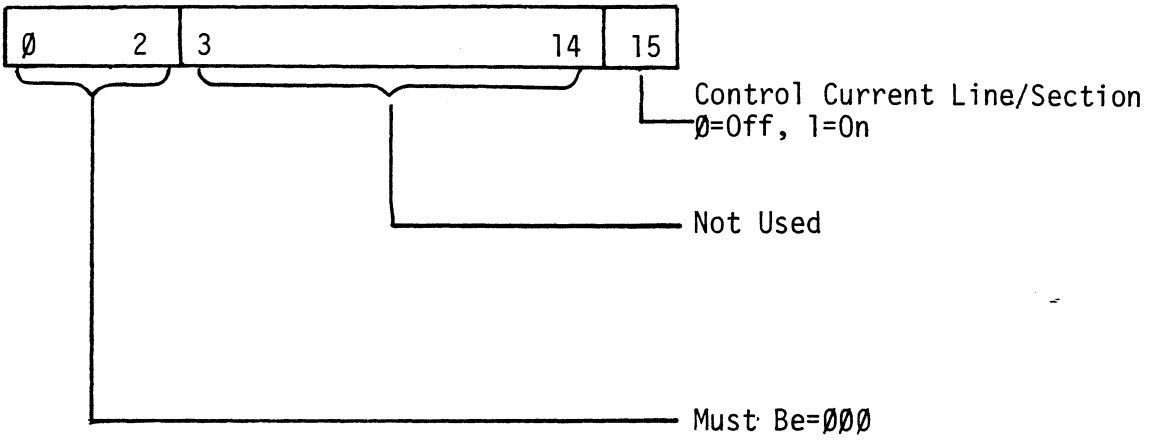


4) Set Modem Control Status
DOB (f) AC, MUX

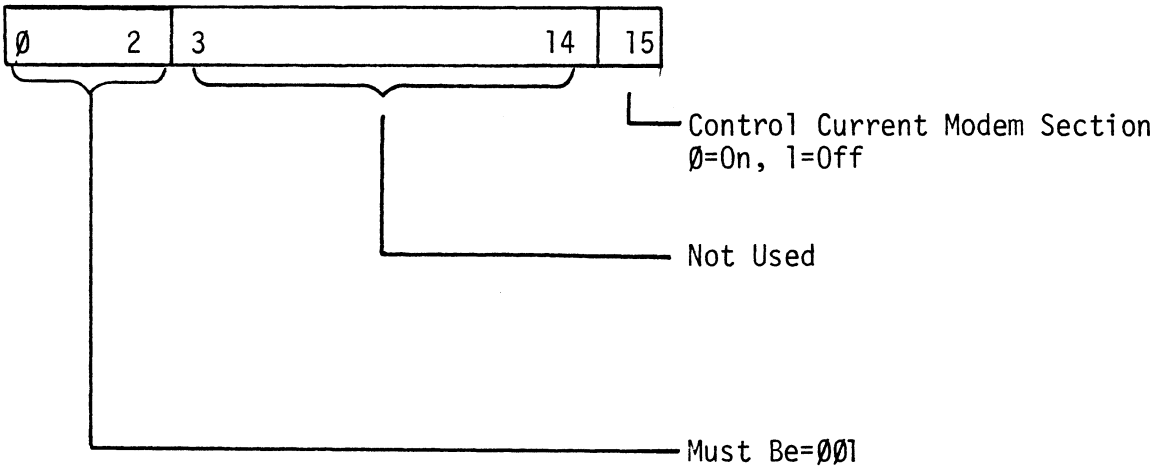


5.0 PROGRAMMING NOTES (cont.)

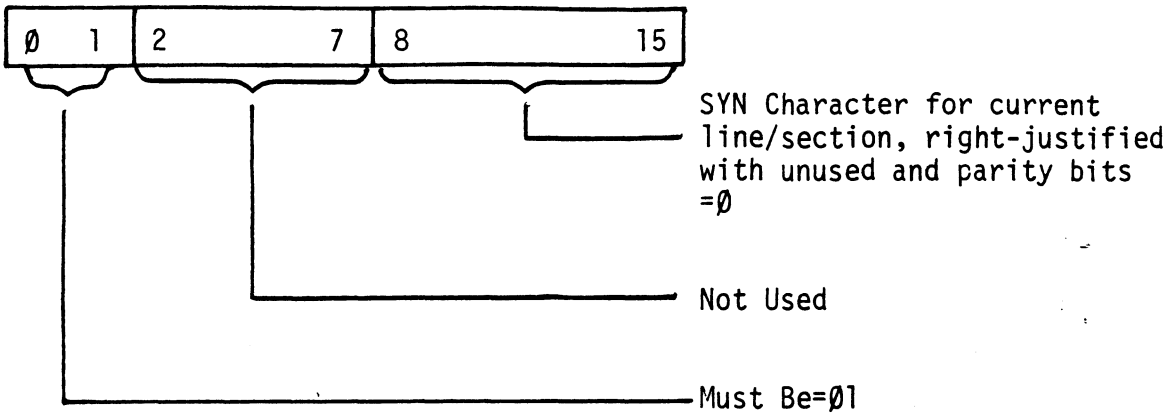
5) Control Line Section
DOC (f) AC, MUX



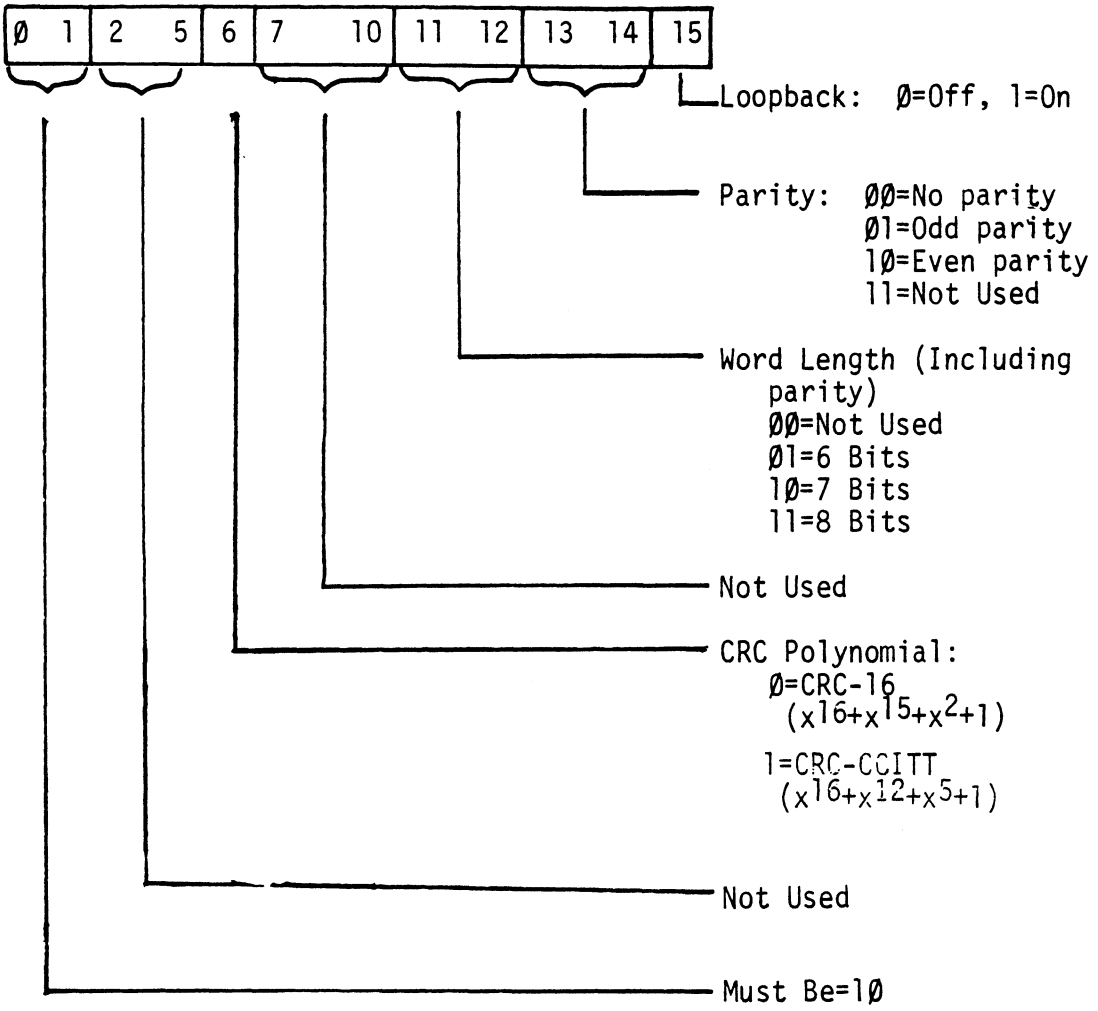
6) Control Modem Section
DOC (f) AC, MUX



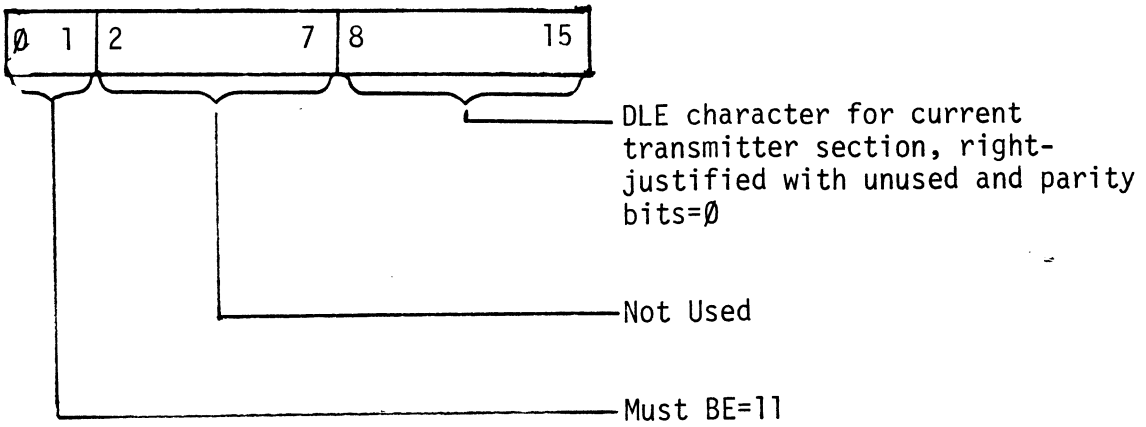
7) Set SYN Character
DOC (f) AC, MUX



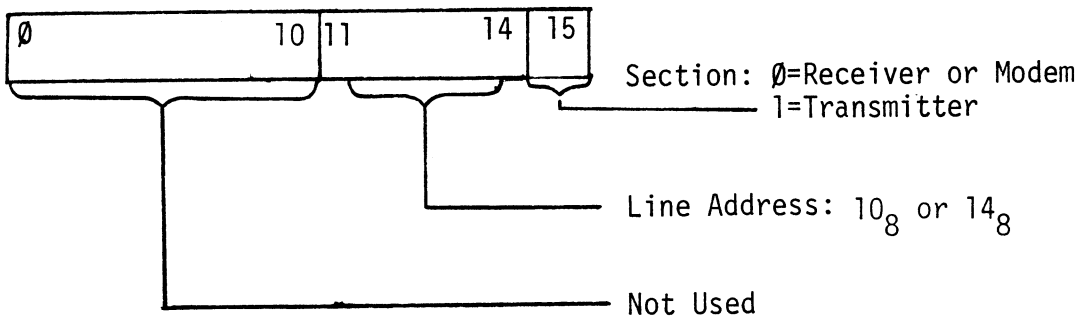
8) Specify Line Characteristics
DOC (f) AC, MUX



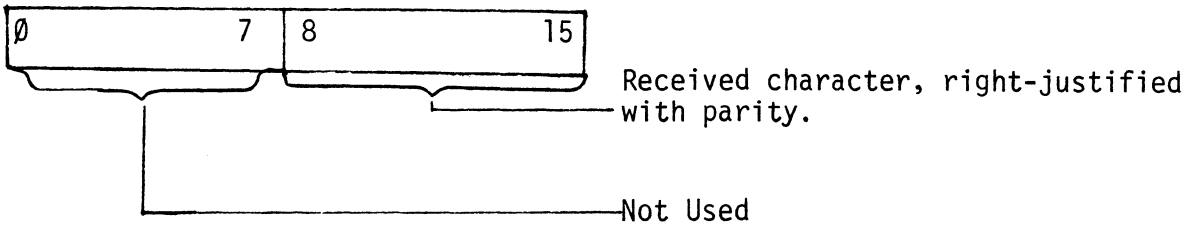
9) Set DLE Character (Transmitter only)
DOC (f) AC, MUX



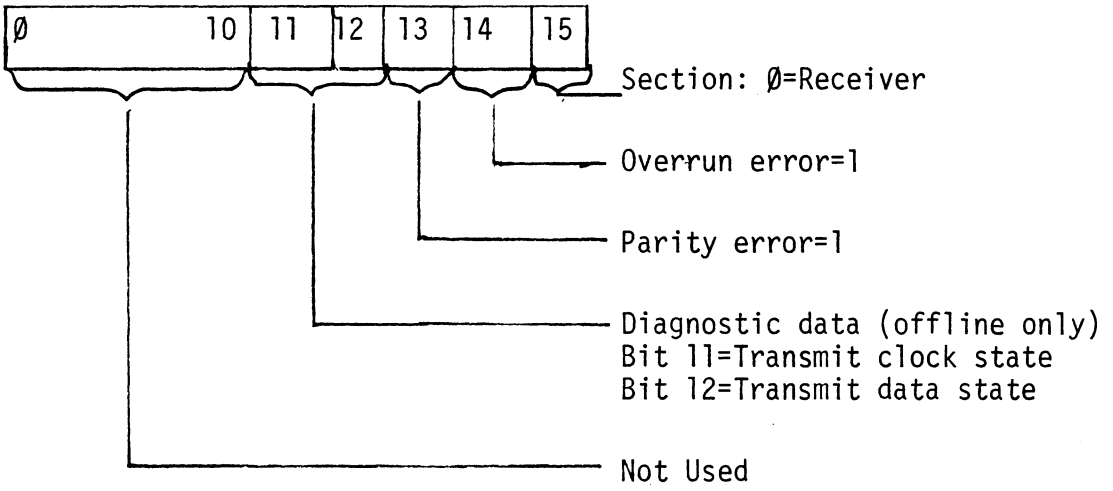
10) Read Line and Section Requesting Service
DIA (f) AC, MUX



11) Read Received Data
DIB (f) AC, MUX

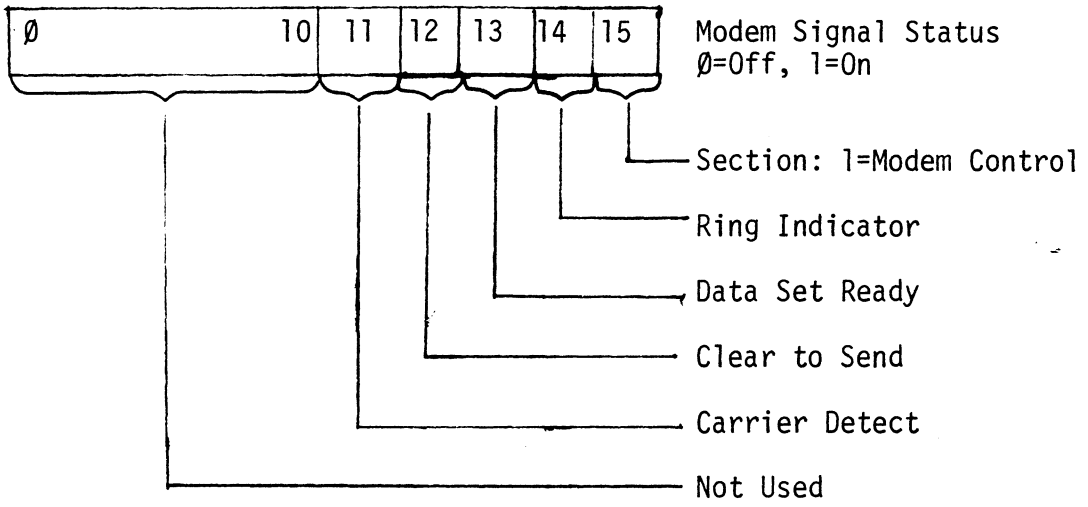


12) Read Receiver Status
DIC (f) AC, MUX

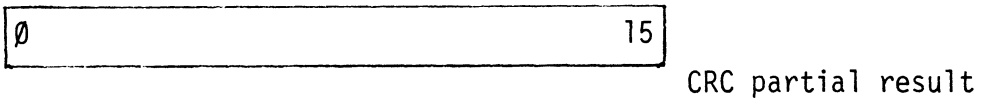


5.0 PROGRAMMING NOTES (cont.)

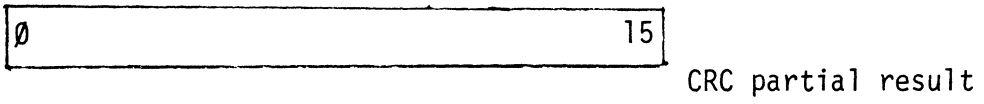
13) Read Modem Status
DIC (f) AC, MUX



14) Load CRC Partial Result
DOB (f) AC, CRC



15) Read CRC Partial Result
DIB (f) AC, CRC



6.0 APPLICATION INFORMATION

6.1 SERIAL INTERFACE

The 25S connector on the internal cable provides serial interface for the PSI. The connector's pin assignments are standard EIA RS-232C and can be found in Section 7.3.

6.1.1 MODEM CONNECTION

Connection to synchronous modems using a 25S connector for digital interface is accomplished using a standard pin to pin cable with 25P connectors on each end (# 300-056-00 available as option). If the modem is externally clocked, be sure that the Local Clock on the PSI is set to provide the proper speed (Section 3.3).

6.1.2 DIRECT DATA LINK

Limited distance direct data links may be made between two synchronous line interfaces by using a modified cable. The signal connections for linking two PSI lines in full-duplex over a direct data link is shown in Figure 6.1 on the following page.

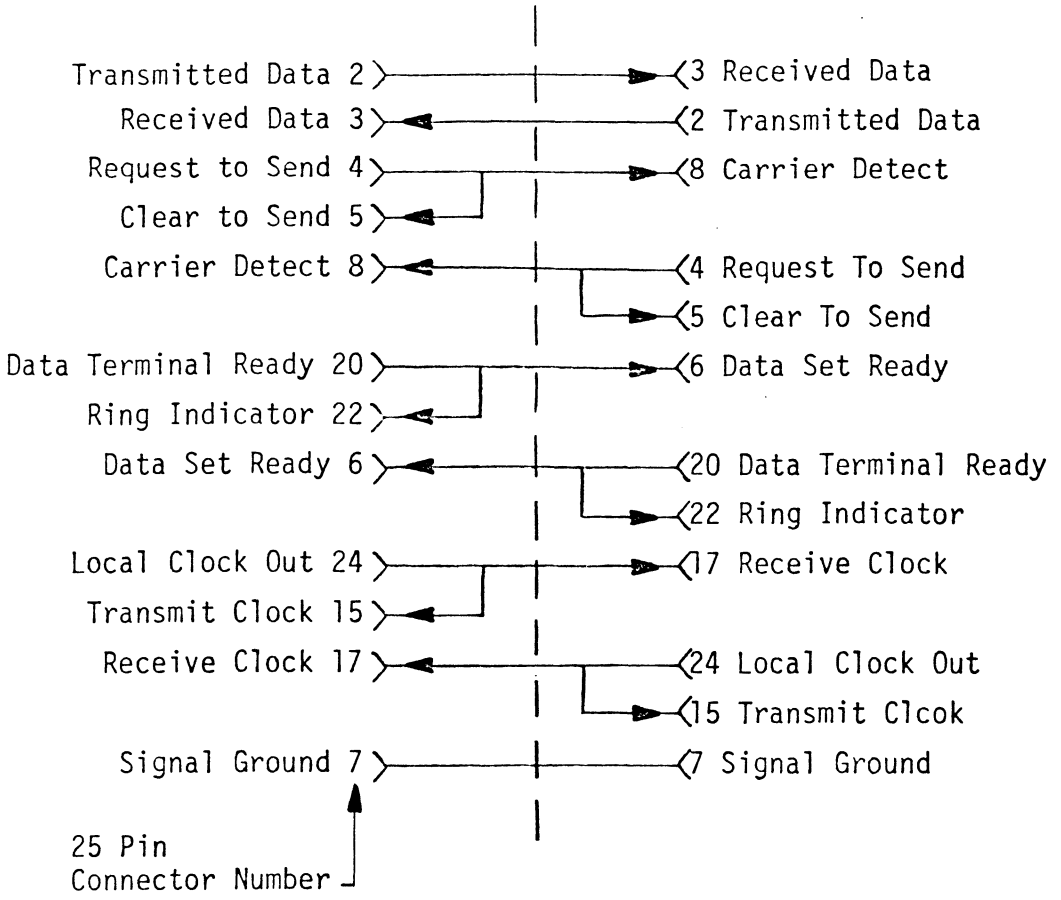


Figure 6.1

Signal Connections for directly connecting
two PSI lines

6.2 USING THE PSI/U WITH AN ASYNC MUX

The PSI/U may be used with a ZETACO Model 400 Multifunction I/O Controller or a Data General 4241/4241A Asynchronous Line Multiplexer to provide up to eight async lines in addition to the sync line.

For both controllers to use the same device code, a Data-In-A priority backpanel jumper must be connected from Pin A83 (PRI-OUT) of the PSI/U board slot to Pin B34 (SYNC-PRI) of the Multifunction I/O Board slot, or Pin B6 of the 4241 board slot.

7.0 INTERFACING

7.1 INTERFACE SIGNALS (CPU)

SIGNAL NAME	ACTIVE LEVEL	PIN NUMBERS
Data 0	L	B62
Data 1	L	B65
Data 2	L	B82
Data 3	L	B73
Data 4	L	B61
Data 5	L	B57
Data 6	L	B95
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	A72
DS1	L	A68
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

7.1 INTERFACE SIGNALS (CPU) (cont.)

SIGNAL NAME	ACTIVE LEVEL	PIN NUMBERS
INTA	H	A40
IOPLS	H	A74
IORST	H	A70
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
PRI-IN	H	A84
PRI-OUT	H	A83

7.3 SERIAL INTERFACE SIGNALS

SIGNAL NAME	25S CONN. PIN #	HEADER CONN. PIN #
*Protective Ground	1	1
Transmitted Data	2	3
Received Data	3	5
Request to Send	4	7
Clear to Send	5	9
Data Set Ready	6	11
Signal Ground	7	13
Carrier Detect	8	15
Test 1	11	21
Transmit Clock	15	4
Receive Clock	17	8
Test 2	18	10
Data Terminal Ready	20	14
Ring Indicator	22	18
Local Clock Out	24	22

*Boards initially have no connection to Protective Ground. To connect Protective Grand to Signal Ground, insert a jumper into J17-1, located near chip loc. A1Ø.

8.0 SPECIFICATIONS

POWER REQUIREMENTS

Power is supplied by the chassis +5 Volt and either the +15 Volt or +12 Volt power supplies.

+5 Volt current	= 3.0A Max
+12 or +15 Volt current	= 70MA Max

SERIAL INTERFACE

Communication with the modem is in accordance with EIA Standard RS-232C signal levels.

Transmit	
Mark	-12 Volts Nominal
Space	+12 Volts Nominal
Receive	
Mark	- 3 to -25 Volts
Space	+ 3 to +25 Volts

ENVIRONMENTAL

Operating Temperature	10°C to 40°C
Operating Humidity	10% to 90% NC
Non-operating Temperature	-40°C to 55°C
Non-operating Humidity	10% to 90%

9.0 DIAGNOSTIC TESTING

A diagnostic tape (400-247-00) is provided with the PSI which contains diagnostic and reliability tests for testing the controller board. If a problem is suspected, the reliability test should be run to determine if a problem exists in the controller circuitry.

The tape is 9 track, 800 bpi (bits per inch) with a "T-BOOT" loader.

9.1 LOADING AND RUNNING TESTS

With the tape loaded on the drive and ready (at load point) initiate a program-load from the tape drive unit. A menu of the contents of the tape should be displayed. Enter the file number of the test to be run followed by a carriage-return. A description of the tests on files may be found at the end of this Section.

The tests begin by asking the operator questions pertaining to hardware configuration such as controller model, device code, line address, processor type, etc. These parameters should be verified before testing.

For PSI/U boards the reliability test UMUX RELI is used. This test requires no hardware modification or test plug, however, a test plug must be used if modem control is to be tested. Test plug information is found in the listing Section which follows. Once the test is running, status is periodically displayed which shows the number of successful passes of individual tests, and the total number of errors. If an error occurs a brief description of the error is displayed. If excessive errors occur, re-check hardware configuration. If errors still exist, the diagnostic test may be run to help isolate the specific problem.

NOTE: Maximum operating speed of the reliability test may vary depending on the speed of the processor used. If excessive overruns occur, reduce the local clock speed to 4800 baud or less.

9.1 LOADING AND RUNNING TEST (cont.)

The diagnostic test PSI DIAG may be run to help isolate a problem. A test plug is required which terminates the ribbon cable when running the diagnostic test. Test plug information is found in the following Section. For dual line boards (PSI/2), the test plug is jumper connecting Line 0 to Line 1. If no errors occur, "PASS..." will be displayed. If an error occurs, the program count of the error will be displayed and the test will loop on the error. A description of the error may be found by locating the program count in the listing Section which follows.

MAG TAPE 400-247-00

File Ø - T-BOOT loader program
File 1 - Directory - list of files on tape
File 2 - PSI DIAG - diagnostic program for testing the PSI. ②
File 3 - PMUX RELI - reliability test for PSI/1 or PSI/2 type boards. ①
File 4 - UMUX RELI - reliability test for PSI/U type boards. ①
File 5 - The previous save files in dump format for storage on disk.

NOTE 1: If for any reason the reliability tests cannot be loaded and run, Data General's 4200 RELI and 4243R tests may be run as alternatives for PMUX RELI and UMUX RELI, respectively.

NOTE 2: To run the PSI DIAG test, a test plug must be used to terminate the 25S connector of the ribbon cable. See the listing header in the next section for plug specifications.

ZETA

Please give us your comments.

Please use this form to send us your comments regarding this Technical Manual. Your input is greatly appreciated! Problems will be promptly addressed and action taken as necessary. If you wish a written reply, please furnish your name and mailing address. Thank you.

Date_____

Name_____Title_____

Firm_____

Address_____

City/State/Zip_____

TECHNICAL MANUAL TITLE_____

DOCUMENT NUMBER_____REVISION_____

ERRORS IN MANUAL:

SUGGESTIONS FOR IMPROVING EITHER THE MANUAL OR THE PRODUCT:

```
 0001  PSID     AOS ASSEMBLER REV 04.20         10:13:24 05/31/84
01               ;
02               ;*********************************************************************
03               ;
04               ;
05               ; DESCRIPTION:  PSI DIAGNOSTIC
06               ;
07               ;
08               ; CUSTOM SYSTEMS INC, 1982
09               ;*********************************************************************
                         .TITL   PSID
11        000001         .DUSR   X=1
12               ;1.     PROGRAM NAME: PSID.SR
13               ;
14               ;2.     REVISION HISTORY
15               ;
16               ;       REV.      DATE
17               ;        00     01/06/82
18               ;        01     02/12/82        ;WAIT BUSY CRC
19               ;        02     05/31/84        ;ADD NOP'S INS A011-A016 FOR S280
20
21               ;3.     MACHINE REQUIREMENTS
22               ;3.1    NOVA/ECLIPSE FAMILY PROCESSOR
23               ;3.2     CONSOLE DEVICE
24               ;3.3     PROGRAMABLE SYNCHRONOUS INTERFACE
25               ;3.4     16K READ/WRITE MEMORY
26               ;3.5     JUMPER PLUG(S)
27               ;3.6    OPTIONAL HARDWARE SUPPORTED:
28               ;       DCU 50 OR DCU 200 (DCU TO PSI BACKPLANE JUMPER PLUG REQUIRED)
29               ;
30               ;4.0   TEST REQUIREMENTS
31               ;       JUMPER PLUGS REQUIRED FOR FULL TEST,NO
32               ;       PLUGS NEEDED FOR BAUD TEST ONLY.
33
34               ;5.     SUMMARY
35               ;         THE PSI DIAGNOSTIC PERFORMS A GATE BY GATE
36               ;         TEST OF THE PROGRAMABLE SYNCHRONOUS INTERFACE
37               ;         CONTROLLER.  THE TEST INCLUDES MOST OF THE LOGIC
38               ;         ON THE 15X15 INCH SYNCHRONOUS BOARD. THE TEST IS EXE-
39               ;         CUTED USING JUMPER PLUG(S)
40               ;       NOTE: SPARES JUMPERS HAVE TO BE IN TO RUN MODEM TESTS WITH PSI/1 AND PSI
41               ;5.1    PSI/1 JUMPER PLUG CONNECTS THE FOUR MODEM OUTPUTS
42               ;         TO THE FOUR MODEM INPUTS OF THE SAME LINE IN THE FOLLOWING MANNER:
43               ;         DTR   TO      RING
44               ;         RTS   TO      DSR
45               ;         SPA   TO      CD
46               ;         SPB   TO      CTS
47               ;5.2    PSI/2 JUMPER PLUGS CONNECTS THE SAME MODEM LINES AS THE PSI/1
48               ;         AND ALSO CONNECTS:
49               ;         LINE 0 TRANSMITTER TO LINE 1 RECEIVER
50               ;         LINE 1 TRANSMITTER TO LINE 0 RECEIVER
51               ;         LOCAL CLK0 TO XMT CLK0 AND RCV CLK1
52               ;         LOCAL CLK1 TO XMT CLK1 AND RCV CLK0
53               ;5.3    PSI/U JUMPER PLUG CONNECTS TWO MODEM OUTPUTS
54               ;         TO THE FOUR MODEM INPUTS IN THE FOLLOWING MANNER:
55               ;         DTR   TO      RING AND CTS
56               ;         RTS   TO      DSR AND CD
57               ;
58               ;6.     RESTRICTIONS    NONE
59               ;
```

```
10002  PSID
01              ;7.  PROGRAM DESCRIPTION/THEORY OF OPERATION
02              ;7.1       THE PSI DIAGNOSTIC IS A GATE BY GATE TEST
03              ;          OF MOST OF THE CONTROLLER LOGIC.  EXCEPT FOR A
04              ;          FEW TESTS, ALL OPERATIONS ARE DONE IN THE DIAGNOSTIC
05              ;          MODE, WITH CLOCKING VIA THE IOPLS.  EACH ROUTINE BE-
06              ;          GINS WITH AN INITIALIZING SUBROUTINEAND ENDS
07              ;          WITH AN ITERATION SUBROUTINE (LOOP).
08              ;7.2     THE ORDER OF FUNCTION TESTING IS AS FOLLOWS:
09              ;          CONTROL LOGIC (SYMBOLIC TESTS AXXX)- COMMON LOGIC
10              ;            TO ALL LINES, INTERRUPT CONTROL, DONE AND BUSY
11              ;            SET AND RESET, BOARD CLEAR (NIOC).
12              ;          TIMING LOGIC (SYMBOLIC TCLKX)- CORRECT TIMING
13              ;            OF THE INTERNAL TRANSMIT/RECEIVE CLOCK.
14              ;          TRANSMITTER TESTS(SYMBOLIC TRXX)- MOST OF THE
15              ;            TRANSMITTER LOGIC IS TESTED IN THESE TESTS, BY
16              ;            STEPPING THE DIAGNOSTIC TRANSMIT CLOCK THROUGH EACH
17              ;            TRANSMIT BIT AND EXAMINING THE "XDAT" OUTPUT THROUGH
18              ;            DIAGNOSTIC DIC, BIT 12, FOR VARIOUS COMBINATIONS OF
19              ;            DLE, SYN, AND TRANSMIT DATA.
20              ;          RECEIVER TESTS (SYMBOLIC RXXX)- MOST OF THE RE-
21              ;            CEIVER LOGIC IS TESTED BY STEPPING THE DIAGNOSTIC
22              ;            TRANSMIT/RECEIVE CLOCK TO EACH STAGE OF RECEIVER
23              ;            INPUT AND EXAMINING THE INTERMEDIATE RECEIVE WORD.
24              ;          MODEM CONTROL OUTPUTS AND INPUTS (SYMBOLIC MXXX)
25              ;          MISCELLANEOUS (SYMBOLIC TXXX)- TESTS OF THE
26              ;            RECEIVER/TRANSMITTER INTERACTIONS NOT TESTED
27              ;            PREVIOUSLY, LOOPBACK, PARITY ERRORS, ON-LINE
28              ;            TRANSMISSION, INTERBOARD PRIORITIES, ALL COMB-
29              ;            INATIONS OF LINE CHARACTERISTICS, AND OVERRUN.
30              ;          CRC (SYMBOLIC TESTS CRCXX)-
31              ;          "PASS" IS PRINTED EACH TIME THE TEST COMPLETES .
32
33              ;8.      OPERATING MODES/SWITCHES
34              S?WPD    8.1
35              O?DTD    8.2
36              ;
37              ;9.      OPERATING PROCEDURE
38              ;9.1      TURN POWER OFF
39              ;9.1.1    CONNECT TEST PLUGS
40              ;9.1.2    TURN POWER ON
41              ;9.2      LOAD THE PROGRAM VIA THE BINARY LOADER
42              ;9.3      SET SWITCHES TO 000200 (RESTART ONLY)
43              ;9.4      PRESS START (RESTART ONLY)
44
45              ;9.4.1   THE PROGRAM WILL RESPOND BY REQUESTING THE OPERATOR
46              ;          TO TYPE 1 TO RUN BAUD RATE TEST ONLY. THE OPERATOR
47              ;          MUST TYPE A 1 TO RUN BAUD RATE ONLY, TYPING ANYTHING
48              ;          ELSE WILL CAUSE PROGRAM TO ASSUME FULL TEST IS DESIRED.
49
50              ;9.4.2   THE PROGRAM WILL NEXT ASK THE OPERATOR
51              ;          TO TYPE THE DEVICE CODE. A 2 DIGIT OCTAL NUMBER FOL-
52              ;          LOWED BY A CARRIAGE RETURN IS EXPECTED.  THIS NUMBER
53              ;          SHOULD CORRESPOND TO THE SYNC CONTROLLER DEVICE CODE
54              ;          (EITHER 34 OR 44).
55
56              ;9.4.3   THE PROGRAM WILL NEXT ASK THE OPERATOR THE TYPE OF
57              ;         SYNC BOARD. (1=PSI/1 2=PSI/2 0=PSI/U) TYPE A ONE TWO OR ZERO
58              ;         DEPENDING ON THE TYPE OF BOARD.
59
60              ;9.4.4   IF A 1 OR 2 WAS ENTERED TO 9.4.3
```

```
01              ;       THE PROGRAM WILL NEXT ASK THE OPERATOR TO TYPE THE
02              ;         ADDRESS OF THE FIRST LINE (IN DECIMAL).  THIS IS THE
03              ;         *RIGHT JUSTIFIED*(!) BOUNDARY ADDRESS AS DEFINED BY
04              ;         SWITCHES IF 2-LINE CONTROLLER, AND
05              ;         THE ACTUAL RIGHT JUSTIFIED LINE ADDRESS IF 1-LINE
06              ;         CONTROLLER, OR IF TESTING ONLY ONE LINE IS DESIRED.
07              ;         TYPE DECIMAL ADDRESS OF THAT LINE AND CARRIAGE RETURN.
08              ;
09              ;9.4.5  IF A 0 WAS ENTERED TO 9.4.3
10              ;       THE PROGRAM WILL NEXT ASK THE OPERATOR IF
11              ;       THE LINE ADDRESS IS 8 OR 12. TYPE LINE ADDRESS AND CARRIAGE RETURN
12              ;
13              ;9.4.6  TYPE A 1 TO CRC OPTION QUESTION ONLY IF THERE IS A
14              ;         CRC GENERATOR ON THE PSI UNDER TEST.
15              ;
16              ;9.4.7  INPUT TRANSMIT CLOCK FREQUENCY IN HERTZ, ONE OF
17              ;         THE FOLLOWING VALUES: 38400,19200,9600
18              ;         4800,2400,1200,OR 600.
19              ;
20              ;9.4.8  THE PROGRAM WILL ASK IF THERE IS A DCU IN THE SYSTEM
21              ;       TYPE A 1 OTHERWISE 0. IF A ONE IS TYPED THE PROGRAM
22              ;         WILL FIRST REQUEST THE OPERATOR TO TYPE THE DCU
23              ;         DEVICE CODE.  A 2 DIGIT OCTAL NUMBER FOLLOWED BY A
24              ;         CARRIAGE RETURN IS EXPECTED.  THIS NUMBER SHOULD
25              ;         CORRESPOND TO THE DCU DEVICE CODE (ANY NUMBER
26              ;         FROM 1 TO 76 OCTAL).
27              ;
28              ;9.5    WHEN OPERATOR INPUT IS COMPLETE, EXECUTION OF THE
29              ;         TEST PROGRAM BEGINS. WHEN A COMPLETE PASS IS MADE
30              ;         WITH ALL LINES TESTED , THE WORD "PASS" WILL BE
31              ;         TYPED ON THE CONSOLE DEVICE.
32              ;
33              ;9.6    RESTART PROCEDURE
34              ;         THE PROGRAM MAY BE RESTARTED AT 200 FOR REPEAT
35              ;         EXECUTION. THIS MAY BE DONE MANUALLY OR VIA ^R
36              ;         OR ^D.
37              ;         IF THE PROGRAM IS RUNNING IN A DCU THE RESET
38              ;         SWITCH MUST BE PRESSED TO RESTART MANUALLY AT
39              ;         200. ALSO TWO ^R'S  OR ^D'S ARE REQUIRED TO
40              ;         BRING THE HOST BACK. THE FIRST CONTROL R OR D
41              ;         WILL PUT THE MACHINE IN A SPECIAL SWITCH INPUT
42              ;         MODE WHERE THE SWITCHES MAY BE SET OR EXAMINED
43              ;         USING THE "M" COMMAND.
44              ;
45              ;9.6.1  THE MESSAGE TYPE 1 FOR NEW PARAMETERS WILL APPEAR
46              ;         ON RESTART. TYPING A 1 WILL PRODUCE ALL OF THE
47              ;         QUESTIONS INITIALLY ANSWERED. TYPING ANY OTHER
48              ;         CHARACTER WILL BEGIN TESTS USING THE PREVIOUSLY
49              ;         GIVEN PARAMETERS.
50              ;
51              ;10.    PROGRAM OUTPUT/ERROR DESCRIPTION
52              ;10.1   IF A MALFUNCTION IS DETECTED, THE PROGRAM WILL PRINT
53              ;         THE CARRY, THE AC'S AND THE PC+1 OF THE ERROR CALL.
54              ;         THE ROUTINE WILL ENTER A LOOP SUITABLE FOR SCOPING.
55
56              ;11.    DEBUG HELP
57              ;11.1   DESCRIPTION OF COMMUNICATION SYSTEM I/O FUNCTIONS:
58              ;
59              ;11.1.1 DEVICE CODE MUX = 34 (OCTAL) ,44 SECONDARY
60              ;                  CRC = 35         ,45 SECONDARY
```

```
0004  PSID
01                ;
02                ;11.1.2 DOA AC,MUX      SPECIFIES THE ABSOLUTE LINE ADDRESS TO
03                ;                       BE USED IN CONJUNCTION WITH A DATA OUT
04                ;                       INSTRUCTION TO TRANSMIT,RECEIVE, OR
05                ;                       MODEM.
06                ;
07                ;               BITS 0-6        NOT USED
08                ;
09                ;               BITS 7-14       ABSOLUTE LINE ADDRESS
10                ;
11                ;               BIT 15          0=RECEIVE OR MODEM CONTROL
12                ;                               1=TRANSMIT CONTROL
13                ;
14                ;11.1.3 DOB AC,MUX      SPECIFIES TRANSMIT DATA, TRANSMIT MODE
15                ;                       (ENTER OR LEAVE TRANSPARENT), AND MODEM OUT.
16                ;
17                ;               BITS 0-1        TRANSMIT OR MODEM CONTROL
18                ;                               10=MODEM CONTROL
19                ;                               00=NORMAL TRANSMIT DATA
20                ;
21                ;               BITS 2-3        TRANSPARENCY CONTROL
22                ;
23                ;                               00=NORMAL TRANSMIT
24                ;                               10=TRANSMIT AND LEAVE XPARENT
25                ;                               11=TRANSMIT AND ENTER XPARENT
26                ;               BITS 4-7        NOT USED
27                ;
28                ;               BITS 8-15       TRANSMIT DATA (IN TRANSMIT MODE)
29                ;
30                ;                               MODEM CONTROL SIGNALS
31                ;
32                ;               BIT 12          A SPARE (IF JUMPERED)
33                ;
34                ;               BIT 13          B SPARE (IF JUMPERED)
35                ;
36                ;
37                ;               BIT 14          1=TURN ON RTS
38                ;                               0=TURN OFF RTS
39                ;
40                ;               BIT 15          1=TURN ON DTR
41                ;                               0=TURN OFF DTR
42                ;
43                ;11.1.4 DOC AC,MUX      SPECIFIES ON/OFF CONTROL OF XMIT/RECV
44                ;                       OR MODEM, OUTPUT SYNC AND DLE CHARACTERS,
45                ;                       AND LINE CHARACTERISTICS.
46                ;
47                ;
48                ;               BITS 0-2        000=XMIT/RECV CONTROL
49                ;
50                ;               BITS 3-14       NOT USED
51                ;
52                ;               BIT 15          0=OFF
53                ;                               1=ON
54                ;
55                ;               BITS 0-2        001=MODEM CONTROL
56                ;
57                ;               BITS 3-14       NOT USED
58                ;
59                ;               BIT 15          0=ON
60                ;                               1=OFF
```

```
0005  PSID
01                ;
02                ;               BITS 0-1        01=SYNC CHARACTER
03                ;
04                ;               BITS 2-7        NOT USED
05                ;
06                ;               BITS 8-15       SYNC CHARACTER
07                ;
08                ;
09                ;               BITS 0-1        11=DLE CHARACTER
10                ;
11                ;               BITS 2-7        NOT USED
12                ;
13                ;               BITS 8-15       DLE CHARACTER
14                ;
15                ;               BITS 0-1        10 SPECIFIES PARITY, STOP BITS,
16                ;                               LINE SPEED, CHAR CODE LEVEL, AND
17                ;                               LOOPBACK CONTROL.
18                ;
19                ;               BITS 2-5        NOT USED
20                ;
21                ;               BIT 6           CRC POLY SELECT
22                ;
23                ;               BITS 7-10       NOT USED
24                ;
25                ;               BITS 11-12      SPECIFY CODE LEVEL
26                ;
27                ;                               00 = 5 LEVEL CODE
28                ;                               01 = 6 LEVEL CODE
29                ;                               10 = 7 LEVEL CODE
30                ;                               11 = 8 LEVEL CODE
31                ;
32                ;               BITS 13-14      PARITY SELECT
33                ;
34                ;                               00 = NOT USED
35                ;                               01 = ODD PARITY
36                ;                               10 = EVEN PARITY
37                ;                               11 = RESERVED
38                ;
39                ;               BIT 15          LOOPBACK CONTROL
40                ;
41                ;                               0 = LOOPBACK OFF
42                ;                               1 = LOOPBACK ON
43                ;
44                ;11.1.5 DIA AC,MUX       SPECIFIES IMPLICIT ADDRESS OF INT-
45                ;                        ERRUPTING LINE, RECEIVE, MODEM, OR
46                ;                        TRANSMIT, AND FORCES A DOA AS EXPLICIT
47                ;                        ADDRESS FOR OUTPUTTING.
48                ;
49                ;               BITS 0-6        NOT USED
50                ;
51                ;               BITS 7-14       EXPLICIT ADDRESS
52                ;
53                ;               BIT 15          TRANSMIT OR RECV/MODEM CONTROL
54                ;
55                ;                               0= RECEIVE OR MODEM INTERRUPT
56                ;                               1= TRANSMIT INTERRUPT
57                ;
58                ;11.1.6 DIB AC,MUX       SPECIFIES RECEIVED DATA ON RECEIVE INT-
59                ;                        ERRUPT.
60                ;
```

```
0006  PSID
01              ;               BITS 0-7        NOT USED
02              ;
03              ;               BITS 8-15       RECEIVE DATA
04              ;
05              ;11.1.7 DIC AC,MUX      SPECIFIES RECEIVER DONE/STATUS OR
06              ;                       MODEM DONE/STATUS
07              ;
08              ;               BITS 0-10       NOT USED
09              ;
10              ;                       RECEIVER STATUS
11              ;               BIT 11          DIAGNOSTIC DATA
12              ;               BIT 12          DIAGNOSTIC DATA
13              ;
14              ;               BIT 13          PARITY ERROR
15              ;
16              ;               BIT 14          OVERRUN
17              ;
18              ;               BIT 15          0=RECEIVER STATUS
19              ;
20              ;                       MODEM STATUS
21              ;
22              ;               BIT 11          CD STATUS
23              ;
24              ;                               1=CD IS ON
25              ;                               0=CD IS OFF
26              ;
27              ;               BIT 12          CTS STATUS
28              ;
29              ;                               1=CTS ON
30              ;                               0= CTS OFF
31              ;
32              ;               BIT 13          DSR STATUS
33              ;
34              ;                               1= DSR ON
35              ;                               0= DSR OFF
36              ;
37              ;               BIT 14          RING STATUS
38              ;
39              ;                               1= RING ON
40              ;                               0= RING OFF
41              ;
42              ;               BIT 15          MODEM STATUS CONTROL
43              ;
44              ;                               1= MODEM STATUS
45              ;
46              ;11.1.8 EFFECT OF 'BUSY' AND 'DONE' ON COMMUNICATIONS CONTROL
47              ;
48              ;       DONE:   DONE SETS ON   LINES WHEN ONE
49              ;               OF THE FOLLOWING EVENTS OCCURS:
50              ;                 1. CHARACTER RECEIVED.
51              ;                 2. TRANSMIT BUFFER EMPTY
52              ;                 3. MODEM STATUS HAS CHANGED.
53              ;               INTERRUPTS OCCUR IN THE ABOVE ORDER OF PRIORITY,
54              ;               AND FROM LOWEST TO HIGHEST NUMBERED LINES.  A
55              ;               'NIOC MUX' WILL CLEAR DONE, AS WELL AS A
56              ;               'NIOS MUX' AND 'IORST'.
57              ;
58              ;       IORESET:  CLEARS LOGIC AND PLACES CONTROLLERS IN OFFLINE
59              ;               DIAGNOSTIC MODE.
60              ;
```

```
0007  PSID
01              ;       START:  SAME AS IORESET  .
02              ;
03              ;       CLEAR:  CLEARS 'DONE' AND INTERRUPT LOGIC AND PLACES
04              ;               CONTROLLERS IN ONLINE MODE.
05              ;
06              ;       IOPLS(MUX):     STEPS INTERNAL CLOCKS IN
07              ;                       'DIAGNOSTIC' MODE.
08              ;
09              ;12.    SPECIAL NOTES/SPECIAL FEATURES
10              ;12.1   IN THE EVENT OF SUCCESSFUL OPERATION OF THIS TEST, THE
11              ;         COMMUNICATIONS RELIABILITY TEST SHOULD BE
12              ;         RUN IF A PROBLEM STILL EXISTS..
13
14              ;12.2   DON'T RUN TEST ROUTINES OUT OF SEQUENCE, AS A TEST MAY
15              ;         REQUIRE SCRATCH PAD DATA OR SETUP SEQUENCING FROM A
16              ;         PREVIOUS TEST. AFTER A POWER DOWN, RELOAD THE PROGRAM
17
18              ;12.3   THE FOLLOWING FUNCTIONS ARE NOT TESTED BY THIS PROGRAM:
19              ;       INTERRUPT PRIORITY AND MUX DEVICE PRIORITY.
20
21              ;12.4   CERTAIN TESTS ARE LABELED "KEY TESTS" BECAUSE THEY
22              ;         LOAD THE DLE AND SYN REGISTERS IN THE TRANSMITTER
23              ;         AND/OR RECEIVER.  THIS INFORMATION IS USED IN
24              ;         SUBSEQUENT TESTS AND THEREFORE NOT RELOADED IN THESE
25              ;         TESTS.  IF A TRANSMITTER, RECEIVER, OR COMBINATION
26              ;         TEST (TXXX) FAILS, IT MAY BE DUE TO IMPROPER LOAD-
27              ;         ING OF THE DLE OR SYN REGISTERS IN THESE PRE-
28              ;         VIOUS "KEY TESTS".  IF THIS CONDITION IS SUSPECTED,
29              ;         LOOK UP THE NEAREST, PREVIOUS "KEY TEST" AND
30              ;         FORCE A SCOPE LOOP BY CHANGING THE CODE IN THE LOC-
31              ;         ATION JUST PRECEDING THE "EHALT" TO A "401" (JMP .+1)
32              ;         AND RESTART THE PROGRAM.  THE PROGRAM WILL EVEN-
33              ;         TUALLY HALT AT THAT TEST.  AFTER PRESSING CONTINUE,
34              ;         EXAMINE PROPER LOADING OF THESE REGISTERS AT THAT
35              ;         TIME BY SYNCING ON -(LOAD).  THE "KEY TESTS" ARE
36              ;         AS FOLLOWS:
37              ;               TR03    TR40    R030    T071
38              ;               TR13    TR49    T046    T072
39              ;               TR21    TR69    T066    T082
40              ;               TR29    R025    T070    T089
41              ;
42              ;12.5   IF THE SYNC CONTROLLER IS BEING RUN VIA A DCU, ALL
43              ;         CODE WILL BE EXECUTED BY THE DCU, AND THE DCU WILL
44              ;         TRANSFER CONTROL OF THE PROGRAM TO THE MAIN PROCESSOR
45              ;         FOR ALL OPERATOR AND CONSOLE INTERFACING
46              ;       ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
47              ;       ; NOTE:   THE DCU DIAGNOSTIC SHOULD BE                   ;
48              ;       ; RUN PRIOR TO RUNNING THIS PROGRAM TO INSURE ITS        ;
49              ;       ; RELIABILITY                                           ;
50              ;       ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
51              ;         IF THE CONTROL O INPUT IS MADE TO TRANSFER
52              ;         CONTROL TO THE HARDWARE ODT IN A DCU SYSTEM
53              ;         THE ODT IS EXECUTED FROM THE DCU AND WILL REFERECE
54              ;         DCU LOCAL MEMORY. AVOID RESTARTING THE PROGRAM
55              ;         WITH A 200R COMMAND IN THIS CASE AS THE DCU WILL
56              ;         BE EXECUTING THE INITIAL CODE NOT INTENDED FOR ITSELF
57              ;         AND WILL PRODUCE THE "UNANTICIPATED DCU HALT"
58              ;         MESSAGE.
59              ;
60              ;12.6   THE CYCLE TIME OF MOST TESTS HAS BEEN DELAYED
```

```
01              ;       TO USE THE SOFT SWITCH REGISTER. IF THIS DELAY LOOP
02              ;       IS OBJECTIONABLE , THE SOFT SWITCH REGISTER MAY BE
03              ;       FORSAKEN BY CHANGING THE LOOP CALL FROM A "JSR@ ICY?C"
04              ;       (006231) TO A "JSR@ ICYC?" (006227)
05
06              ;12.7   ON ALL INPUT REQUESTS THE OPERATOR MAY ELECT
07              ;       TO ALTER FLOW OF THE PROGRAM BY STRIKING A
08              ;       CONTROL O, R OR D.
09              ;
10              ;13.    RUN TIME        EACH PASS DEPENDS UPON THE NUMBER
11              ;       OF LINE AND THE BAUD RATE SELECTED.AT THE HIGHEST
12              ;       RATE A SINGLE LINE WILL TYPE PASS IN ABOUT 6 SECONDS
13              ;       AT THE LOWEST RATE TWO LINES WILL TAKE 25 MINUTES.
```

```
!10009  PSID
01        000000 .DUSR   D=0
02               .MACRO  MUXCLKA
03                       LDA     0,°1
04                       JSR     @ICONT
05               %
06               .MACRO  SDONE
07                       LDA     2,TRADR          ;SET DONE
08                       DOA     2,MUX            ;BY TURNING ON XMITTER
09                       SUBZL   0,0
10                       DOC     0,MUX
11               %
12               .MACRO  ADROUT
13                       LDA     2,RECADR         ;ADDRESS CORRECT
14                       DOA     2,MUX            ;BOARD
15               %
16               .MACRO  MASK
17                       LDA     0,°1             ;ENABLE INTERRUPT
18                       MSKO    0                ;FOR THIS DEVICE
19               %
20               .MACRO  OFFMDM
21                       LDA     0,RECADR         ;OUTPUT MODEM CONTROL
22                       DOA     0,MUX    ;WORD
23                       LDA     2,COFF           ;TURN MODEM SECTION OFF
24                       DOC     2,MUX            ;WORD
25                       LDA     1,°1
26                       DOB     1,MUX
27               %
28               .MACRO  MODEM
29                       LDA     0,RECADR         ;OUTPUT MODEM CONTROL
30                       DOA     0,MUX            ;WORD
31                       LDA     1,°1
32                       DOB     1,MUX
33               %
34               .MACRO  LCS
35                       JSR     @.LINCH          ;OUTPUT LINE CHARACTERISTICS
36                       100000+°1+°2+°3
37               %
38               .MACRO  XMIT
39                       LDA     0,TRADR          ;TURN ON TRANSMITTER
40                       DOA     0,MUX
41                       SUBZL   0,0              ;THIS SETS DONE
42                       DOC     0,MUX
43               %
44               .MACRO  XOR.
45                       JSR     @.XOR            ;"XOR" AC0 WITH AC1
46               %
47               .MACRO  RECEIVER
48                       LDA     0,RECADR
49                       DOA     0,MUX            ;ENABLE RECEIVER
50                       SUBZL   1,1
51                       DOC     1,MUX            ;START RECEIVER
52               %
53               .MACRO  TRANSMIT
54                       JSR@    ITRMT
55               100000+°1+°2+°3
56               %
57               .MACRO  DATACHECK
58                       CHARA   °1,°2
59                       DIA     0,MUX
60                       DIB     0,MUX
```

```
0010  PSID
01                      LDA     1,C°1
02                      SUB#    1,0,SZR         ;DOES RECEIVE WORD MATCH?
03                      EHALT                   ;NO, CHECK TRANSMITTER AND
04                      LOOPX                   ;RECEIVER BUFFERS, LC DECODING
05                                              ;PARITY GENERATOR
06              %
07              .MACRO  STATUS
08                      CHARA   °1,°2
09                      DIA     0,MUX
10                      DIB     0,MUX
11                      DIC     0,MUX           ;INPUT STATUS WORD
12                      LDA     1,°3            ;LOAD MASK
13                      AND#    1,0,SNR         ;CHECK STATUS
14                      EHALT                   ;CHECK PARITY LOGIC
15                      LOOPX                   ;OR RECEIVER OVERRUN
16              %
17              .MACRO  CLCNT
18                      LDA     0,°1
19                      LDA     1,FCOUNT
20                      ADD     1,0
21                      NEG     0,0
22                      NIOP    CRC
23                      INC     0,0,SZR
24                      JMP     .-2
25              %
26              .MACRO  CHECK
27                      DIA     0,MUX
28                      DIC     0,MUX
29                      LDA     1,XMSK
30                      AND#    1,0,°1
31              %
32              .MACRO  UBITCHECK
33                      JSR@    IENT?           ;XMIT SHIFT TO BIT °1
34                      5
35                      IORST
36                      LDA     2,C125          ;TRANSMIT WORD (PSI/U)
37                      LDA     1,UFLAG
38                      MOV     1,1,SNR         ;PSI/U?
39                      DOB     2,MUX           ;YES, LOAD TRANSMIT WORD
40                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
41                      XCLK    C1
42                      MUXCLKA C1
43                      XCLK    C1
44                      MUXCLKA C5
45                      XCLK    °2
46                      CHECK   °3
47                      EHALT                   ;XMIT BIT °1 INCORRECT FROM
48                      LOOPX                   ;SHIFT REGISTER-
49                                              ;DATA BIT °1 IN STORAGE
50              %
51              .MACRO  BITCHECK
52                      JSR@    IENT?           ;XMIT SHIFT TO BIT °1
53                      5
54                      IORST
55                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
56                      XCLK    C1
57                      MUXCLKA C1
58                      XCLK    C1
59                      MUXCLKA C5
60                      XCLK    °2
```

```
0011  PSID
01                      CHECK   °3
02                      EHALT                   ;XMIT BIT °1 INCORRECT FROM
03                      LOOPX                   ;SHIFT REGISTER-
04                                              ;DATA BIT °1 IN STORAGE
05              %
06              .MACRO  TRSCH
07                      JSR@    IENT?           ;XMIT SHIFT TO BIT °1
08                      5
09                      IORST
10                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
11                      XCLK    C1
12                      MUXCLKA C1
13                      LDA     1,°4
14                      DOB     1,MUX
15                      XCLK    C1
16                      MUXCLKA C5
17                      XCLK    °2
18                      CHECK   °3
19                      EHALT                   ;XMIT BIT  °1 INCORRECT
20                      LOOPX                   ;FROM DATA BIT °1 IN
21                                              ;STORAGE
22              %
23              .MACRO  RCVBIT
24                      JSR@    IENT?
25                      5
26                      IORST
27                      TRANSMIT        LOOPBACK,NOPARITY,CODE°3
28                      XCLK    C1
29                      RECEIVER
30                      MUXCLKA C1
31                      LDA     1,°4
32                      DOB     1,MUX
33                      XCLK    C1
34                      MUXCLKA C5
35                      XCLK    C°1
36                      DIA     0,MUX
37                      DIB     0,MUX
38                      LDA     1,°2
39                      SUB#    1,0,SZR
40                      EHALT                   ;BIT °1 OF SHIFTER,
41                      LOOPX                   ;DIB O.C. GATES
42              %
43              .MACRO  DATAOUT
44                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
45                      CHARA   °1,8.
46                      DIA     0,MUX
47                      DIB     0,MUX           ;INPUT RECEIVE DATA
48                      LDA     1,C°1
49                      SUB#    1,0,SZR         ;DOES DATA MATCH?
50                      EHALT                   ;NO, CHECK RECEIVER SYNC
51                      LOOPX                   ;WORD STORAGE, COMPARATOR
52              %
53              .MACRO  CHARA
54                      JSR@    ICHRA
55                      °1
56                      4*°2-2
57                      2*°2+2+(2*(8.-°2))
58              %
59              .MACRO  XCLK
60                      LDA     0,°1
```

```
 0012  PSID
01                      JSR     @.STEP
02              %
03              .MACRO  SYNC
04                      JSR@    IENT?
05                      5
06                      IORST
07                      ADROUT
08                      LDA     0,°1
09                      DOC     0,MUX
10                      INC     2,2
11                      DOA     2,MUX
12                      DOC     0,MUX
13              %
14              .MACRO  X.CLK
15                      LDA     2,CM°1
16                      XCLK    C1
17                      MUXCLKA C5
18                      INC     2,2,SZR
19                      JMP     .-5
20              %
21              .MACRO  CLCHK
22                      DIA     0,MUX
23                      DIC     0,MUX
24                      LDA     1,.CMSK
25                      AND#    1,0,°1
26                      EHALT                   ;CHECK TRANSMIT CLOCK
27                      LOOPX                   ;COUNTERS
28              %
29              .MACRO  EHALT
30                      JSR@    IERR?
31              %
```

```
!0013  PSID
01        000000 .NOLOC  0
02        000000 .NOMAC  0
03        000000         .LOC    0
04 00000 000002          2
05 00001 000010          10
06 00002 000200          200
07 00003 002002          JMP     @.-1
08 00004 000000          0
09 00005 000000          0
10        000010         .LOC    10
11 00010 002000          JMP     @0              ;INTERRUPT RTN
12        000045         .LOC    45
13 00045 020776          EGGS                    ;DO NOT INSERT,LOC 45
14                                                ;CONTAINS EGGS POINTER
15        000060         .LOC    60
16                ;CONSTANTS
17        000000 NOLOOP=           0
18        000001 LOOPBACK=         1
19        000000 NOPARITY=         0
20        000002 ODDPARITY=        2
21        000004 EVENPARITY=       4
22        000010 CODE6=            10
23        000020 CODE7=            20
24        000030 CODE8=            30
25        000034 .DUSR   MUX=34
26        000035 .DUSR   CRC=35
27        000076 .DUSR   DCU=      76
28 00060 000774 AMASK:           774
29 00061 000040 K40:             40
30 00062 063700 .SKIP:           SKPDZ   0
31 00063 020001 COFF:            20001           ;TURN MODEM SECTION OFF WITH DOC
32 00064 020000 CON:             20000           ;TURN MODEM SECTION ON WITH DOC
33 00065 100002 RTS:             100002
34 00066 100001 DTR:             100001
35 00067 100000 OFF:             100000
36 00070 100010 SPA:             100010
37 00071 100004 SPB:             100004
38 00072 000010 XMSK:            10
39 00073 000020 .CMSK:           20
40 00074 000377 RBYT:            377
41                ;VARIABLES
42
43 00075 000000 BDADR:           0
44 00076 000034 DEVCD:           MUX
45 00077 000076 DCODE:   DCU
46 00100 000000 TEMP:            0
47 00101 000000 RECADR:          0       ;RECV/MODEM ADDRESS #1
48 00102 000000 TRADR:           0       ;TRANSMIT ADDRESS #1
49 00103 000000 ORADR:           0       ;RECV/MODEM ADDRESS #2
50 00104 000000 OTADR:           0       ;TRANSMIT ADDRESS #2
51 00105 000000 SWITCH:          0
52 00106 000000 TEM:             0
53 00107 000000 TIMED:           0
54 00110 000000 THING:           0
55 00111 000000 COUNT:           0       ;COUNT FOR XCLOCKS
56 00112 000001 NLINES:          1       ;# OF LINES (1 OR 2)
57 00113 003100 FCOUNT:          16.*100.        ; TO BAUD RATE 2400
58 00114 000000 CRCOP:           0       ;CRC OPTION
59 00115 000000 CRCF:            0       ;CRC OPTION FLAG
60 00116 000000 YES:     0                       ;DCU EXISTS FLAG
```

```
 0014  PSID
01 00117 000000 UFLAG:  0               ;ZERO = PSI/U
02              ;ADDRESSES
03
04 00120 000135 .LINCH: LINCH
05 00121 000140 ICONT:  CONT
06 00122 017153 IDCHNG: DCHNG
07 00123 000440 .STEP:  STEP
08 00124 000146 .XOR:   ..XOR
09 00125 016061 ICHRA:  CHRA
10 00126 000200 RES?T:  JMP     200
11 00127 000000 PASS:0
12 00130 002224 ITR01:  TR01
13 00131 020204 IODT?:  ODT?J
14 00132 016370 IDCRS:  DCRES           ;DCU ESCAPE R
15 00133 016507 ITTD:   TTID
16 00134 016460 ITTI:   TTII
17              ;SUBROUTINES
18
19 00135 021400 LINCH:  LDA     0,0,3           ;CREATE LINE CHARACTERISTICS
20 00136 063034         DOC     0,MUX           ;WORD FROM SEPARATE
21 00137 001401         JMP     1,3             ;REQUIREMENTS AS
22                                              ;SPECIFIED BY MACRO LCS
23 00140 100400 CONT:   NEG     0,0
24 00141 060334         NIOP    MUX
25 00142 101404         INC     0,0,SZR
26 00143 000141         JMP     .-2
27 00144 001400         JMP     0,3
28 00145 000000         0
29 00146 050145 ..XOR:  STA     2,.-1           ;SAVE AC2
30 00147 131000         MOV     1,2             ;"XOR" AC0 WITH AC1
31 00150 113520         ANDZL   0,2             ;RESULTS IN AC1
32 00151 107000         ADD     0,1
33 00152 146400         SUB     2,1
34 00153 030145         LDA     2,..XOR-1
35 00154 001400         JMP     0,3             ;RETURN TO CALLER
36 00155 016120 ITRMT:  TRMT
37
38       000000         .TXTM   0
39       000200         .LOC    200
40              P?GOU BEG1,K,J,5,200,70000,5
41       000000         .DUSR   COM?P=0
42       000200         .LOC    200
43
44 00200 002202 DTO?SB: JMP     @BGN?ADR        ;START PROGRAM HERE
45 00201 000000 HEL?P:  0                       ;CURRENT TEST ADDRESS
46 00202 000466 BGN?ADR:        BEG1            ;PROGRAM STARTING ADDRESS
47 00203 000000 PAS?S:  0                       ;PASS COUNT
48 00204 000005 PA?SIN: 5                       ;INTERNAL PASS COUNT
49 00205 000005 PA?SVL: 5                       ;INTERNAL PASS COUNT VALUE
50
51 00206 000000 ITR?R:  0                       ;ERROR SWITCH
52 00207 000000 AC3?:   0                       ;PAGE ZERO LOCATION FOR AC3
53 00210 000000 ODO?K:  0                       ;PAGE ZERO LOCATION FOR BREAKPOINT
54 00211 070000 ERR?4:  70000                   ;DELAY TIME FOR L?OPX
55              ;       PAGE ZERO POINTERS
56 00212 020776 IEGG?S: EGGS
57 00213 021003 ISWR?EG:        SWREG           ;SWITCH REGESTER POINTER
58 00214 020372 IINP?:  INP?K                   ;SWITCH PACK POINTER
59 00215 017220 IMES?S: MES?S                   ;MESSAGE PRINT ROUTINE POINTER
60 00216 017267 ICRL?F: CRL?F                   ;CR/LF PRINT ROUTINE POINTER
```

```
 0015  PSID
01 00217 017416 ITYP?E: TYP?E                   ;CHARACTER PRINT ROUTINE POINTER
02 00220 017322 IPDE?C: PDE?C                   ;DECIMAL PRINT ROUTINE POITNER
03 00221 017312 IPDC?S: PDC?S                   ;DECIMAL AND 1 CHAR PRINT ROUTINE POINTER
04 00222 017304 IPOC?T: POC?T                   ;OCTAL PRINT ROUTINE POINTER
05 00223 017300 IZOC?T: ZOC?T                   ;ZERO SUPPRESSED OCTAL PRINT ROUTINE
06 00224 017562 ITI?O:  TIN?O                   ;OCTAL INPUT ROUTINE POINTER
07 00225 017566 ITI?D:  TIN?D                   ;DECIMAL INPUT ROUTINE POINTER
08 00226 020412 IENT?R: ENT?R                   ;ENTER ROUTINE POINTER
09 00227 020441 ICYC?E: CYC?J                   ;CYCLE ROUTINE POINTER
10 00230 020575 IERR?:  ERR?J                   ;ERROR ROUTINE POINTER
11 00231 020432 ICY?C:  CYC?X                   ;DELYED CYCLE ROUTINE POINTER
12 00232 017413 ITPS?P: TPS?P                   ;TYPE SPACE ROUTINE POINTER
13
14 00233 000000 IOM?O:  0
15       006231 LOOPX=  JSR@    ICY?C           ;DELAYED LOOP
16 00234 000000 C0:     0
17 00235 000001 C1:     1
18 00236 000002 C2:     2
19 00237 000003 C3:     3
20 00240 000004 C4:     4
21 00241 000005 C5:     5
22 00242 000006 C6:6
23 00243 000007 C7:7
24 00244 000010 C8.:8.
25 00245 000011 C9.:9.
26 00246 000012 C10.:10.
27 00247 000013 C11.:11.
28 00250 000014 C12.:12.
29 00251 000015 C13.:13.
30 00252 000016 C14.:14.
31 00253 000017 C15.:15.
32 00254 000020 C16.:16.
33 00255 000010 C10:    10
34 00256 000011 C11:    11
35 00257 000012 C12:    12
36 00260 000013 C13:    13
37 00261 000017 C17:    17
38 00262 000020 C20:    20
39 00263 000021 C21:    21
40 00264 000025 C25:    25
41 00265 000026 C26:    26
42 00266 000027 C27:    27
43 00267 000030 C30:    30
44 00270 000036 C36:    36
45 00271 000037 C37:    37
46 00272 000040 C40:    40
47 00273 000060 C60:    60
48 00274 000067 C67:    67
49 00275 000076 C76:    76
50 00276 000077 C77:    77
51 00277 000100 C100:   100
52 00300 000120 C120:   120
53 00301 000124 C124:   124
54 00302 000125 C125:   125
55 00303 000127 C127:   127
56 00304 000140 C140:   140
57 00305 000167 C167:   167
58 00306 000177 C177:   177
59 00307 000200 C200:   200
60 00310 000213 C213:   213
```

```
 0016  PSID
01 00311 000237 C237:   237
02 00312 000240 C240:   240
03 00313 000250 C250:   250
04 00314 000252 C252:   252
05 00315 000260 C260:   260
06 00316 000267 C267:   267
07 00317 000270 C270:   270
08 00320 000277 C277:   277
09 00321 000357 C357:   357
10 00322 000367 C367:   367
11 00323 000373 C373:   373
12 00324 000375 C375:   375
13 00325 000376 C376:   376
14 00326 000377 C377:   377
15 00327 000400 C400:   400
16 00330 020125 C2012:  20125
17 00331 020252 C2025:  20252
18 00332 030125 C3012:  30125
19 00333 030252 C3025:  30252
20 00334 040001 C4000:  40001
21 00335 040125 C4012:  40125
22 00336 040026 C4002:  40026
23 00337 040252 C4025:  40252
24 00340 100011 C1000:  100011
25 00341 100000 C100K:  100000
26 00342 101000 C101K:  101000
27 00343 140000 C1400:  140000
28 00344 140125 C1401:  140125
29 00345 140252 C1402:  140252
30 00346 140001 C14.1:  140001
31 00347 177776 CM2:    -2
32 00350 177772 CM6:    -6
33 00351 177770 CM8.:   -8.
34 00352 177766 CM10.:  -10.
35 00353 177764 CM12.:  -12.
36 00354 177762 CM14.:  -14.
37 00355 177760 CM16.:  -16.
38 00356 177577 CM201:  -200-1
39 00357 177576 CM202:  -201-1
40 00360 177400 CM256.: -256.
41 00361 177757 CM17.:-17.
42 00362 177756 CM18.:-18.
43 00363 177742 CM30.:-30.
44 00364 177760 CM20:-20
45 00365 040026 SY026:40026
46 00366 040000 SY000:40000
47
48              ;VALUE IN AC DETERMINES # OF INTERRATIONS
49       000440 .LOC    440
50 00440 054111 STEP:   STA     3,COUNT
51 00441 114400         NEG     0,3
52 00442 024073         LDA     1,.CMSK
53 00443 060434         DIA     0,MUX
54 00444 062434         DIC     0,MUX           ;FIND INITIAL STATE OF XCLK
55 00445 123404         AND     1,0,SZR
56 00446 000407         JMP     .+7             ;STATE IS NONZERO
57 00447 060335         NIOP    CRC             ;CLOCK UNTIL STATE IS NONZERO
58 00450 062434         DIC     0,MUX
59 00451 123405         AND     1,0,SNR
60 00452 000775         JMP     .-3
```

```
 0017  PSID
01 00453 175405          INC     3,3,SNR         ;OK, STEP COUNTER
02 00454 002111          JMP     @COUNT          ;COUNTER IS FINISHED
03 00455 060335          NIOP    CRC             ;CLOCK UNTIL STATE IS ZERO
04 00456 062434          DIC     0,MUX
05 00457 123404          AND     1,0,SZR
06 00460 000775          JMP     .-3
07 00461 175405          INC     3,3,SNR         ;OK, STEP COUNTER
08 00462 002111          JMP     @COUNT          ;COUNTER IS FINISHED
09 00463 000764          JMP     .-14            ;NOT DONE, LOOK FOR NONZERO AGAIN
10
11 00464 000717 XBG11:   BEG11
12 00465 000000 WHAT:    0
13 00466 062677 BEG1:    IORST                   ;IN THE BEGINNING, RESET I/O
14 00467 006215          JSR@    IMES?S          ;NAME
15 00470 021004          DIRT
16 00471 024774          LDA     1,WHAT
17 00472 125005          MOV     1,1,SNR         ;INPUT PARS SET?
18 00473 000410          JMP     BEG1A           ;NO
19 00474 006215          JSR@    IMES?S
20 00475 016767          INPDS                   ;TYPE 1 IF NEW PARAMETERS DESIRED
21 00476 006134          JSR@    ITTI            ;GET CHAR
22 00477 002765          JMP@    XBG11           ;NONE NEEDED
23 00500 102520          SUBZL   0,0
24 00501 106414          SUB#    0,1,SZR         ;SEE IF A 1?
25 00502 002762          JMP@    XBG11           ;NOT A 1
26 00503 006215 BEG1A:   JSR@    IMES?
27 00504 017013          BCONL                   ;TYPE 1 TO RUN BAUD CLOCK ONLY
28 00505 006134          JSR@    ITTI
29 00506 000406          JMP     BEG1B           ;NOT A 1
30 00507 152400          SUB     2,2
31 00510 102520          SUBZL   0,0
32 00511 106415          SUB#    0,1,SNR
33 00512 150000          COM     2,2
34 00513 050110          STA     2,THING
35 00514 102400 BEG1B:   SUB     0,0
36 00515 040075          STA     0,BDADR         ;START AT ZERO
37
38 00516 006215 BEG2:    JSR     @IMES?          ;"TYPE 2 DIGIT DEVICE
39 00517 016557          MCODE                   ; CODE OF SYNC CONTROLLER,
40                                               ; THEN CARRIAGE RETURN"
41 00520 006134          JSR@    ITTI
42 00521 000775          JMP     BEG2            ;ERROR!
43 00522 030275          LDA     2,C76
44 00523 121005          MOV     1,0,SNR         ;"0" NOT ALLOWED
45 00524 000772          JMP     BEG2
46 00525 125213          MOVR#   1,1,SNC
47 00526 146432          SUBZ#   2,1,SZC         ;0<CODE<76 ALLOWED
48 00527 000767          JMP     BEG2
49 00530 040100          STA     0,TEMP          ;MUST BE EVEN #
50 00531 006122          JSR     @IDCHNG         ;CHANGE DEVICE CODE
51 00532 000076          DEVCD
52 00533 000135          LINCH                   ;FIRST LOCATION TO BE CHANGED
53 00534 016127          XXX                     ;LAST LOCATION TO BE CHANGED
54 00535 010076          ISZ     DEVCD
55 00536 020100          LDA     0,TEMP
56 00537 101400          INC     0,0
57 00540 006122          JSR     @IDCHNG         ;CHANGE SECONDARY DEVICE CODE
58 00541 000076          DEVCD
59 00542 000135          LINCH
60 00543 016127          XXX
```

```
 0018  PSID
01 00544 020100          LDA     0,TEMP
02 00545 040076          STA     0,DEVCD         ;C(DEVCD) HOLDS DEVICE CODE
03
04 00546 006215 BEG6:    JSR     @IMES?          ;"TYPE OF SYNC BOARD?
05 00547 016622          LINES                   ; 1=PSI/1 2=PSI/2 0=PSI/U
06 00550 006134          JSR     @ITTI
07 00551 000775          JMP     BEG6            ;INPUT ERROR
08 00552 125015          MOV#    1,1,SNR         ;PSI/U?
09 00553 000407          JMP     BEG6A           ;YES
10 00554 030237          LDA     2,C3
11 00555 146432          SUBZ#   2,1,SZC         ;>2 NOT ALLOWED
12 00556 000770          JMP     BEG6
13 00557 044112          STA     1,NLINES
14 00560 044117          STA     1,UFLAG
15 00561 000417          JMP     BEG3
16 00562 044117 BEG6A:   STA     1,UFLAG
17 00563 125400          INC     1,1
18 00564 044112          STA     1,NLINES
19 00565 006215          JSR     @IMES?          ;"LINE ADDRESS 8 OR 12? (IN DECIMAL)"
20 00566 016653          ULINES
21 00567 006133          JSR     @ITTD
22 00570 000772          JMP     BEG6A           ;INPUT ERROR
23 00571 030244          LDA     2,C8.
24 00572 146415          SUB#    2,1,SNR         ;ADDRESS = TO 8
25 00573 000404          JMP     BEG6B           ;YES
26 00574 030250          LDA     2,C12.
27 00575 146414          SUB#    2,1,SZR         ;ADDRESS = 12
28 00576 000764          JMP     BEG6A           ;NOT 8 OR 12
29 00577 000410 BEG6B:   JMP     BEG3A
30 00600 006215 BEG3:    JSR     @IMES?          ;"TYPE FIRST LINE ADDRESS (IN DECIMAL)="
31 00601 016532          BOUND
32 00602 006133          JSR     @ITTD           ;INPUT BOUNDARY ADDRESS
33 00603 000775          JMP     BEG3            ;INPUT ERROR
34 00604 030360          LDA     2,CM256.
35 00605 133414          AND#    1,2,SZR         ;>255. NOT ALLOWED
36 00606 000772          JMP     BEG3
37 00607 125120 BEG3A:   MOVZL   1,1
38 00610 044075          STA     1,BDADR
39
40 00611 006215 BEG3B:   JSR     @IMES?          ;"TYPE "1" IF CRC OPTION,
41 00612 016744          CRCMSG                  ;"0" IF NOT"
42 00613 006134          JSR     @ITTI
43 00614 000775          JMP     BEG3B
44 00615 125234          MOVZR#  1,1,SZR
45 00616 000773          JMP     BEG3B           ;OPERATOR GOOF
46 00617 124400          NEG     1,1
47 00620 044114          STA     1,CRCOP
48
49 00621 006215 BEG7:    JSR     @IMES?          ;"TYPE TRANSMIT CLOCK
50 00622 016676          CLOCK                   ;BAUD RATE, IN HZ="
51 00623 006133          JSR     @ITTD
52 00624 000423          JMP     BEGW            ;INPUT ERROR
53 00625 020456          LDA     0,BE.X1
54 00626 034456          LDA     3,BE.X1+1
55 00627 122432          SUBZ#   1,0,SZC         ;SKIP IF # IS >= TO 38.4K
56 00630 136032          ADCZ#   1,3,SZC         ;SKIP IF INPUT IS >= 600
57 00631 000416          JMP     BEGW            ;OPERATOR ERROR
58 00632 152400          SUB     2,2             ;ALLOWABLE VALUES ARE 38400,
59 00633 122415          SUB#    1,0,SNR         ;19200,9600,4800,2400,1200
60 00634 000406          JMP     .+6             ;OR 600
```

```
 0019  PSID
01 00635 151400          INC     2,2             ;COUNT FOR LOOKUP TABLE
02 00636 116032          ADCZ#   0,3,SZC         ;SKIP IF # IS >= 600
03 00637 000410          JMP     BEGW
04 00640 101220          MOVZR   0,0             ;CHECK INPUT/2
05 00641 000772          JMP     .-6
06 00642 034443          LDA     3,TABLE         ;AC2 IS TABLE DISPLACEMENT
07 00643 157000          ADD     2,3
08 00644 021400          LDA     0,0,3
09 00645 040113          STA     0,FCOUNT
10 00646 000404          JMP     BEG8
11
12 00647 006215 BEGW:    JSR@    IMES?S
13 00650 017111          POBRT                   ;POSSIBLE RATES ARE
14 00651 000750          JMP     BEG7            ;ASK AGAIN
15 00652 006215 BEG8:    JSR@    IMES?
16 00653 017061          MDCUX                   ;TYPE 0 IF NON DCU SYSTEM
17 00654 006134          JSR@    ITTI            ;GET INPUT
18 00655 000775          JMP     BEG8            ;INPUT ERROR
19 00656 125005          MOV     1,1,SNR         ;RUN DCU?
20 00657 000436          JMP     BEG9            ;NO
21 00660 006215 BEG10:   JSR@    IMES?           ;
22 00661 016722          MDCU                    ;TYPE TWO DIGIT DEV CODE OF DCU
23 00662 006134          JSR@    ITTI
24 00663 000775          JMP     BEG10           ;INPUT ERROR
25 00664 030275          LDA     2,C76
26 00665 121004          MOV     1,0,SZR         ;0 NOT LEGAL
27 00666 146432          SUBZ#   2,1,SZC         ;LESS THAN OR EQ 76
28 00667 000771          JMP     BEG10
29 00670 044100          STA     1,TEMP
30 00671 006122          JSR@    IDCHN           ;CHANGE DEV CODE
31 00672 000077          DCODE                   ;ORIG CODE
32 00673 016232          .DCSTR                  ;STARTING ADDRESS
33 00674 016402          HDINO                   ;FINAL ADDRESS
34 00675 126000          ADC     1,1
35 00676 044116          STA     1,YES           ;SET DCU FLAG
36 00677 024100          LDA     1,TEMP
37 00700 044077          STA     1,DCODE         ;KEEP NEW CODE
38 00701 000416          JMP     BEG11           ;GO START DCU
39 00702 000465 .WHAT:WHAT
40 00703 113000 BE.X1:   38400.
41 00704 001130          600.
42
43 00705 000706 TABLE:   .+1     ;VALUES GIVE 1/2 CYCLE
44 00706 000040          1*32.           ;38.4K BAUD
45 00707 000100          2*32.           ;19.2K BAUD
46 00710 000200          4*32.           ;9600 BAUD
47 00711 000400          8.*32.          ;4800 BAUD
48 00712 001000          16.*32.         ;2400 BAUD
49 00713 002000          32.*32.         ;1200 BAUD
50 00714 004000          64.*32.         ;600 BAUD
51 00715 102400 BEG9:    SUB     0,0
52 00716 040116          STA     0,YES
53 00717 126000 BEG11:   ADC     1,1
54 00720 046762          STA     1,@.WHAT
55 00721 020116          LDA     0,YES           ;DCU EXISTS FLAG
56 00722 101004          MOV     0,0,SZR         ;A DCU?
57 00723 002402          JMP@    .+2             ;YES,GO START IT
58 00724 000402          JMP     .+2
59 00725 016232          .DCSTR
60
```

```
 0020  PSID
01 00726 024075          LDA     1,BDADR
02 00727 044075 BEG4:    STA     1,BDADR
03 00730 044101          STA     1,RECADR
04 00731 125400          INC     1,1
05 00732 044102          STA     1,TRADR
06 00733 125400          INC     1,1
07 00734 044103          STA     1,ORADR
08 00735 125400          INC     1,1
09 00736 044104          STA     1,OTADR
10 00737 102400 BEG5:    SUB     0,0
11 00740 040105          STA     0,SWITCH
12 00741 040115          STA     0,CRCF
13
14               ;INITIALIZE MODEM REGISTER ON POWER UP
15
16 00742 020410          LDA     0,MDOBW
17 00743 024236          LDA     1,C2
18 00744 030407          LDA     2,MDOBW+1               ;MAX LINE NUMBER
19 00745 071034          DOA     2,MUX                   ;SELECT LINE
20 00746 062034          DOB     0,MUX                   ;AND SET MODEM REGS
21 00747 132422          SUBZ    1,2,SZC                 ;NEXT LINE
22 00750 000775          JMP     .-3
23 00751 000403          JMP     A000
24
25 00752 100000 MDOBW:   100000
26 00753 001000          1000
```

```
!0021  PSID
01                ;MAIN PROGRAM STARTS HERE
02
03 00754 006226 A000:   JSR@    IENT?           ;SELD LINE GROUNDED
04 00755 000005         5
05 00756 062677         IORST
06 00757 063700         SKPDZ   0               ;CHECK O.C. GATE TO SELD
07                      EHALT
08 00760 006230         JSR@    IERR?
09 00761 006231         LOOPX
10
11 00762 006226 A001:   JSR@    IENT?           ;MUX SEL DONE SHOULD NOT BE
12 00763 000005         5
13 00764 062677         IORST
14 00765 063734         SKPDZ   MUX             ;SET
15                      EHALT                   ;CHECK DONE FLOP, O.C.
16 00766 006230         JSR@    IERR?
17 00767 006231         LOOPX                   ;GATES TO SELD, DONE PRIORITY
18                                              ;CHIP- ALSO XMT SEL, XMT-DN; RCV-DN
19                                              ;MDM DN HELD LOW
20
21 00770 060277 A002:   INTDS
22 00771 006226         JSR@    IENT?           ;NO INTERRUPT SHOULD
23 00772 000005         5
24 00773 062677         IORST
25 00774 102000         ADC     0,0             ;OCCUR
26 00775 062077         MSKO    0
27 00776 060177         INTEN
28 00777 000401         JMP     .+1
29 01000 063477         SKPBN   CPU
30                      EHALT                   ;CHECK INT REQ FLOP,
31 01001 006230         JSR@    IERR?
32 01002 060277         INTDS                   ;AND O.C. GATE TO
33 01003 006231         LOOPX                   ;INT LINE
34
35 01004 006226 A003:   JSR@    IENT?           ;WITH INT. DIS. FLOP
36 01005 000005         5
37 01006 060177         INTEN                   ;ZERO, AN INTERRUPT
38 01007 000401         JMP     .+1             ;OCCURED WITHOUT DONE
39 01010 063477         SKPBN   CPU
40                      EHALT                   ;CHECK AND (INT. DIS., DONE)
41 01011 006230         JSR@    IERR?
42 01012 060277         INTDS
43                      LOOP
44 01013 006227         JSR     @ICYC?E         ;END OF SUBTEST
45
46
47 01014 006226 A004:   JSR@    IENT?           ;A DIA INSTRUCTION TO
48 01015 000005         5
49 01016 062677         IORST
50 01017 060400         DIA     0,0             ;DEVICE ZERO SHOULD READ NO
51 01020 101014         MOV#    0,0,SZR         ;BITS
52                      EHALT                   ;CHECK FOR GROUNDS ON
53 01021 006230         JSR@    IERR?
54 01022 006231         LOOPX                   ;IN/OUT BUS, INTACK HIGH,
55                                              ;PRI DINA GATING, DIA, DIB MUX
56
57 01023 006226 A005:   JSR@    IENT?           ;WITH NO DONE FLAGS SET
58 01024 000005         5
59 01025 062677         IORST
60 01026 061477         INTA    0               ;NO DEVICE CODES SHOULD
```

```
 0022  PSID
01 01027 101014          MOV#    0,0,SZR          ;BE READ BACK VIA INTA
02                       EHALT                    ; DONE TO INTACK
03 01030 006230          JSR@    IERR?
04 01031 006231          LOOPX
05
06 01032 006226 A006:    JSR@    IENT?
07 01033 000005          5
08 01034 062677          IORST
09                       MODEM   OFF              ;CLEAR MODEM OUTS, IF ANY
10 01035 020101          LDA     0,RECADR         ;OUTPUT MODEM CONTROL
11 01036 061034          DOA     0,MUX            ;WORD
12 01037 024067          LDA     1,OFF
13 01040 066034          DOB     1,MUX
14 01041 020103          LDA     0,ORADR
15 01042 061034          DOA     0,MUX
16 01043 066034          DOB     1,MUX
17                       SDONE
18 01044 030102          LDA     2,TRADR          ;SET DONE
19 01045 071034          DOA     2,MUX            ;BY TURNING ON XMITTER
20 01046 102520          SUBZL   0,0
21 01047 063034          DOC     0,MUX
22 01050 101100          MOVL    0,0              ;DUMMY INSTRUCTION
23 01051 063634          SKPDN   MUX              ;CHECK DONE SET
24                       EHALT                    ;NOT SET-CHECK O.C.GATE
25 01052 006230          JSR@    IERR?
26 01053 006231          LOOPX                    ;TO SELD, DONE FLOP,INPUT GATE
27                                                ;BDEN LOGIC,MUX SEL,MUX BD SEL,XMT-DN
28                                       ; FLOP, XMT SEL, IORST ALWAYS
29                                                ;ON,-(MUX BD RES),START PULSE,
30                                                ;DEVICE SELECT, ADCOMP, RQENB,
31                                                ;REN,, DOC, UDIA, DOA, DATA15
32
33 01054 006226 A06A:    JSR@    IENT?            ;CRC NEEDED OFF FOR MUX SEL
34 01055 000005          5
35 01056 062677          IORST
36                       SDONE
37 01057 030102          LDA     2,TRADR          ;SET DONE
38 01060 071034          DOA     2,MUX            ;BY TURNING ON XMITTER
39 01061 102520          SUBZL   0,0
40 01062 063034          DOC     0,MUX
41 01063 101100          MOVL    0,0              ;DUMMY INSTRUCTION
42 01064 063745          SKPDZ   45
43                       EHALT                    ;CHECK CRC SIGNAL TO MUX SEL
44 01065 006230          JSR@    IERR?
45 01066 006231          LOOPX                    ;MUX SEL ALWAYS DECODED
46
47 01067 006226 A007:    JSR@    IENT?            ;SEE THAT IORESET
48 01070 000005          5
49                       SDONE                    ;RESETS DONE
50 01071 030102          LDA     2,TRADR          ;SET DONE
51 01072 071034          DOA     2,MUX            ;BY TURNING ON XMITTER
52 01073 102520          SUBZL   0,0
53 01074 063034          DOC     0,MUX
54 01075 062677          IORST
55 01076 101100          MOVL    0,0              ;DUMMY INSTRUCTION
56 01077 063734          SKPDZ   MUX
57                       EHALT                    ;CHECK IORST LOGIC CHAIN
58 01100 006230          JSR@    IERR?
59 01101 006231          LOOPX                    ;TO -(MUX BD RES) ON DONE FLOP
60                                                ;-(RESET) TO -(XMT-DN)
```

```
 0023  PSID
01 01102 006226 A008:   JSR@    IENT?
02 01103 000005         5
03 01104 062677         IORST
04 01105 020262         LDA     0,C20           ;TEST DEVICE SELECTION
05 01106 040106 A008B:  STA     0,TEM           ;LOGIC-GET MASK
06                                              ;FORM EXCLUSIVE OR
07                      SDONE
08 01107 030102         LDA     2,TRADR         ;SET DONE
09 01110 071034         DOA     2,MUX           ;BY TURNING ON XMITTER
10 01111 102520         SUBZL   0,0
11 01112 063034         DOC     0,MUX
12 01113 020106         LDA     0,TEM           ;WITH MASK AND DEVICE
13 01114 024076         LDA     1,DEVCD         ;CODE TO CHANGE
14 01115 131000         MOV     1,2
15 01116 113520         ANDZL   0,2             ;ONE BIT AT A TIME
16 01117 107000         ADD     0,1
17 01120 146400         SUB     2,1
18 01121 030062         LDA     2,.SKIP         ;ADD NEW DEVICE CODE
19 01122 133000         ADD     1,2             ;IN SKIP INSTRUCTION
20 01123 050401         STA     2,.+1
21 01124 000000         0                       ;SKIP INSTRUCTION HERE
22                      EHALT                   ;CHECK MUX SEL GATE, MUX SEL TO DONE
23 01125 006230         JSR@    IERR?
24 01126 020106         LDA     0,TEM           ;FLOP, SELECTION LOGIC
25 01127 101224         MOVZR   0,0,SZR         ;MOVE MASK RIGHT
26 01130 000756         JMP     A008B
27 01131 006231         LOOPX
28
29 01132 006226 A009:   JSR@    IENT?           ;SEE THAT DONE RESETS
30 01133 000005         5
31 01134 062677         IORST
32                      SDONE                   ;WITH A START PULSE
33 01135 030102         LDA     2,TRADR         ;SET DONE
34 01136 071034         DOA     2,MUX           ;BY TURNING ON XMITTER
35 01137 102520         SUBZL   0,0
36 01140 063034         DOC     0,MUX
37 01141 063734         SKPDZ   MUX             ;WAIT FOR DONE  TO SET
38 01142 000405         JMP     A009A           ;DONE SET
39 01143 151404         INC     2,2,SZR         ;TOO LONG?
40 01144 000775         JMP     .-3             ;NO
41                      EHALT                   ;DONE WONT SET ON THIS LINE
42 01145 006230         JSR@    IERR?
43                                              ;SEE IF LINE IS LEGAL
44 01146 006231         LOOPX                   ;
45 01147 060134 A009A:  NIOS    MUX             ;BDEN ALREADY SET
46 01150 101100         MOVL    0,0             ;DUMMY INSTRUCTION
47 01151 063734         SKPDZ   MUX
48                      EHALT                   ;CHECK START PULSE TO
49 01152 006230         JSR@    IERR?
50 01153 006231         LOOPX                   ;BOARD
51
52 01154 006226 A010:   JSR@    IENT?           ;SEE THAT DONE DOES
53 01155 000005         5
54 01156 062677         IORST
55                                              ;NOT RESET ON A
56                      SDONE                   ;START DEVICE 0
57 01157 030102         LDA     2,TRADR         ;SET DONE
58 01160 071034         DOA     2,MUX           ;BY TURNING ON XMITTER
59 01161 102520         SUBZL   0,0
60 01162 063034         DOC     0,MUX
```

```
 0024  PSID
01 01163 101100          MOVL    0,0             ;DUMMY INSTRUCTION
02 01164 063634          SKPDN   MUX
03 01165 000777          JMP     .-1
04 01166 060100          NIOS    0
05 01167 063634          SKPDN   MUX
06                       EHALT                   ;CHECK MUX BD SEL INPUT
07 01170 006230          JSR@    IERR?
08 01171 006231          LOOPX                   ;TO START LOGIC
09 01172 006226 A011:    JSR@    !ENT?           ;SEE THAT BOARD WILL
10 01173 000005          5
11 01174 062677          IORST
12                                               ;GIVE INTERRUPT
13                       MASK    CM201
14 01175 020356          LDA     0,CM201         ;ENABLE INTERRUPT
15 01176 062077          MSKO    0               ;FOR THIS DEVICE
16 01177 060177          INTEN
17                       SDONE
18 01200 030102          LDA     2,TRADR         ;SET DONE
19 01201 071034          DOA     2,MUX           ;BY TURNING ON XMITTER
20 01202 102520          SUBZL   0,0
21 01203 063034          DOC     0,MUX
22 01204 000401          NOP
23 01205 000401          NOP
24 01206 000401          NOP
25 01207 000401          NOP
26 01210 101100          MOVL    0,0             ;DUMMY INSTRUCTION
27 01211 024020          LDA     1,20            ;DUMMY INSTRUCTION
28 01212 063577          SKPBZ   CPU
29                       EHALT                   ;CHECK INT DIS FLOP, INTR
30 01213 006230          JSR@    IERR?
31 01214 060277          INTDS
32 01215 006231          LOOPX                   ;O.C. GATE, INT FLOP,RQENB
33
34 01216 006226 A012:    JSR@    IENT?           ;DO NOT GET INTERRUPT WITH
35 01217 000005          5
36 01220 062677          IORST
37 01221 102000          ADC     0,0             ;MASK ON
38 01222 062077          MSKO    0
39 01223 060177          INTEN
40                       SDONE
41 01224 030102          LDA     2,TRADR         ;SET DONE
42 01225 071034          DOA     2,MUX           ;BY TURNING ON XMITTER
43 01226 102520          SUBZL   0,0
44 01227 063034          DOC     0,MUX
45 01230 000401          NOP
46 01231 000401          NOP
47 01232 000401          NOP
48 01233 000401          NOP
49 01234 101100          MOVL    0,0             ;DUMMY INSTRUCTION
50 01235 024020          LDA     1,20            ;DUMMY INSTRUCTION
51 01236 063477          SKPBN   CPU
52                       EHALT                   ;CHECK DATA8 INPUT TO
53 01237 006230          JSR@    IERR?
54 01240 006231          LOOPX                   ;INT DIS FLOP, BRESET TO
55                                               ;INT DIS FLOP
56
57 01241 006226 A013:    JSR@    IENT?           ;CLEAR MASK WITH IORST
58 01242 000005          5
59 01243 062677          IORST
60 01244 102000          ADC     0,0
```

```
 0025  PSID
01 01245 062077          MSKO    0
02 01246 062677          IORST
03 01247 060177          INTEN
04                       SDONE
05 01250 030102          LDA     2,TRADR         ;SET DONE
06 01251 071034          DOA     2,MUX           ;BY TURNING ON XMITTER
07 01252 102520          SUBZL   0,0
08 01253 063034          DOC     0,MUX
09 01254 000401          NOP
10 01255 000401          NOP
11 01256 000401          NOP
12 01257 000401          NOP
13 01260 101100          MOVL    0,0             ;DUMMY INSTRUCTION
14 01261 024020          LDA     1,20            ;DUMMY INSTRUCTION
15 01262 063577          SKPBZ   CPU
16                       EHALT                   ;IORST  TO INT DIS FLOP
17 01263 006230          JSR@    IERR?
18 01264 006231          LOOPX
19
20 01265 006226 A014:    JSR@    IENT?
21 01266 000005          5
22 01267 062677          IORST
23                       MASK    CM201
24 01270 020356          LDA     0,CM201         ;ENABLE INTERRUPT
25 01271 062077          MSKO    0               ;FOR THIS DEVICE
26                       SDONE
27 01272 030102          LDA     2,TRADR         ;SET DONE
28 01273 071034          DOA     2,MUX           ;BY TURNING ON XMITTER
29 01274 102520          SUBZL   0,0
30 01275 063034          DOC     0,MUX
31 01276 000401          NOP
32 01277 000401          NOP
33 01300 000401          NOP
34 01301 000401          NOP
35 01302 101100          MOVL    0,0             ;DUMMY INSTRUCTION
36 01303 024020          LDA     1,20            ;DUMMY INSTRUCTION
37 01304 060177          INTEN
38 01305 060234          NIOC    MUX
39 01306 063477          SKPBN   CPU
40                       EHALT                   ;-(MUX BD RES) TO INT ENBLE FLOP
41 01307 006230          JSR@    IERR?
42 01310 060277          INTDS
43 01311 006231          LOOPX
44
45 01312 006226 A015:    JSR@    IENT?           ;CHECK INTERRUPT ACKNOWLEDGE
46 01313 000005          5
47 01314 062677          IORST
48                       MASK    CM201
49 01315 020356          LDA     0,CM201         ;ENABLE INTERRUPT
50 01316 062077          MSKO    0               ;FOR THIS DEVICE
51 01317 060177          INTEN
52                       SDONE
53 01320 030102          LDA     2,TRADR         ;SET DONE
54 01321 071034          DOA     2,MUX           ;BY TURNING ON XMITTER
55 01322 102520          SUBZL   0,0
56 01323 063034          DOC     0,MUX
57 01324 000401          NOP
58 01325 000401          NOP
59 01326 000401          NOP
60 01327 000401          NOP
```

```
 0026  PSID
01 01330 101100          MOVL    0,0             ;DUMMY INSTRUCTION
02 01331 061477          INTA    0
03 01332 060277          INTDS
04 01333 024076          LDA     1,DEVCD         ;DEVICE CODE OF BOARD
05 01334 122414          SUB#    1,0,SZR
06                       EHALT                   ;CHECK INTA GATE, INTACK
07 01335 006230          JSR@    IERR?
08 01336 006231          LOOPX                   ;GATE, DEVICE CODE O.C.
09                                               ;GATES
10 01337 006226 A016:    JSR@    IENT?           ;CREATE INTERRUPT-INSURE
11 01340 000005          5
12 01341 062677          IORST
13                       MASK    CM201
14 01342 020356          LDA     0,CM201         ;ENABLE INTERRUPT
15 01343 062077          MSKO    0               ;FOR THIS DEVICE
16 01344 060177          INTEN
17                       SDONE
18 01345 030102          LDA     2,TRADR         ;SET DONE
19 01346 071034          DOA     2,MUX           ;BY TURNING ON XMITTER
20 01347 102520          SUBZL   0,0
21 01350 063034          DOC     0,MUX
22 01351 000401          NOP
23 01352 000401          NOP
24 01353 000401          NOP
25 01354 000401          NOP
26 01355 060400          DIA     0,0             ;DUMMY READ INPUT
27 01356 060277          INTDS
28 01357 122415          SUB#    1,0,SNR
29                       EHALT                   ;CHECK INACK HIGH OR
30 01360 006230          JSR@    IERR?
31 01361 006231          LOOPX                   ;FLOATING
32
33 01362 020116 A017:    LDA     0,YES           ;IS THIS DCU SYSTEM?
34 01363 101004          MOV     0,0,SZR         ;IF SO DO ALTERNATE TEST
35 01364 000430          JMP     A017B           ;YES
36 01365 020233          LDA     0,IOM?0         ;GET IO MODULE POINTER
37 01366 101004          MOV     0,0,SZR         ;IF ZERO USE TTY
38 01367 000455          JMP     A018            ;OTHERWISE FORGET IT
39 01370 006226          JSR@    IENT?           ;ENABLE HIGHER PRIORITY
40 01371 000005          5
41 01372 062677          IORST
42                                               ;INTERRUPT AND ENSURE
43                                               ;PROPER DEVICE GETS
44                                               ;ACKNOWLEDGED
45                       MASK    CM202
46 01373 020357          LDA     0,CM202         ;ENABLE INTERRUPT
47 01374 062077          MSKO    0               ;FOR THIS DEVICE
48                       SDONE
49 01375 030102          LDA     2,TRADR         ;SET DONE
50 01376 071034          DOA     2,MUX           ;BY TURNING ON XMITTER
51 01377 102520          SUBZL   0,0
52 01400 063034          DOC     0,MUX
53 01401 102400          SUB     0,0
54 01402 061111          DOAS    0,TTO           ;SET DONE ON MUX SEL
55 01403 063511          SKPBZ   TTO             ;START HIGHER DEVICE
56 01404 000777          JMP     .-1
57 01405 024256          LDA     1,C11            ;HIGHER DEVCODE=11
58 01406 061477          INTA    0
59 01407 106434          SUBZ#   0,1,SZR
60                       EHALT                   ;PIN INPUT TO
```

```
 0027  PSID
01 01410 006230          JSR@    IERR?
02 01411 006231          LOOPX                   ;INTACK FLOATING
03
04 01412 000432          JMP     A018
05 01413 173577 C4200:-4200-1
06 01414 006226 A017B:   JSR@    IENT?           ;ENABLE HIGHER PRIORITY
07                                               ;INTERRUPT (DEVICE CODE 76)
08 01415 000005          5
09 01416 062677          IORST
10                                               ;TO CHECK INTPIN ON DCU
11                       MASK    C4200
12 01417 020774          LDA     0,C4200         ;ENABLE INTERRUPT
13 01420 062077          MSKO    0               ;FOR THIS DEVICE
14                       SDONE
15 01421 030102          LDA     2,TRADR         ;SET DONE
16 01422 071034          DOA     2,MUX           ;BY TURNING ON XMITTER
17 01423 102520          SUBZL   0,0
18 01424 063034          DOC     0,MUX
19 01425 102520          SUBZL   0,0             ;SET DONE ON 76( REAL TIME
20 01426 061076          DOA     0,76            ;CLOCK)
21 01427 063476 A017C:   SKPBN   76
22 01430 000407          JMP     A017D           ;DCU CLOCK HAS STRUCK
23 01431 060400          DIA     0,0             ;DELAY LOOP
24 01432 060400          DIA     0,0
25 01433 151404          INC     2,2,SZR         ;TIMEOUT IF DCU CLK NOT
26 01434 000773          JMP     A017C
27                       EHALT                   ;DCU CLOCK WONT RESPOND.
28 01435 006230          JSR@    IERR?
29                       LOOP            ;INPUT TO RTC ON DCU
30 01436 006227          JSR     @ICYC?E         ;END OF SUBTEST
31
32 01437 024275 A017D:   LDA     1,C76
33 01440 061477          INTA    0
34 01441 106434          SUBZ#   0,1,SZR
35                       EHALT                   ;-(INTPIN) INPUT TO
36 01442 006230          JSR@    IERR?
37 01443 006231          LOOPX                   ;INTACK FLOATING
38 01444 006226 A018:    JSR@    IENT?
39 01445 000005          5
40 01446 062677          IORST
41                       SDONE
42 01447 030102          LDA     2,TRADR         ;SET DONE
43 01450 071034          DOA     2,MUX           ;BY TURNING ON XMITTER
44 01451 102520          SUBZL   0,0
45 01452 063034          DOC     0,MUX
46 01453 030102          LDA     2,TRADR         ;SET DONE
47 01454 071034          DOA     2,MUX           ;BY TURNING ON XMITTER
48 01455 102520          SUBZL   0,0
49 01456 063034          DOC     0,MUX
50 01457 101100          MOVL    0,0             ;DUMMY INSTRUCTION
51 01460 060434          DIA     0,MUX           ;READ IN ADDRESS AFTER
52 01461 030060          LDA     2,AMASK         ;SETTING DONE-MASK
53 01462 143400          AND     2,0             ;BOARD ADDRESS-COM
54 01463 024075          LDA     1,BDADR         ;PARE WITH CORRECT
55 01464 147400          AND     2,1
56 01465 122414          SUB#    1,0,SZR         ;BOARD ADDRESS
57                       EHALT                   ;CHECK MUX SEL PIN,
58 01466 006230          JSR@    IERR?
59 01467 006231          LOOPX                   ;PRI DINA, O.C. GATES, DIA,
60                                               ;RD RCV DATA TO DUAL MUX'S
```

```
01
02 01470 006226 A021:   JSR@    IENT?          ;NO INPUT FROM DIA
03 01471 000005         5
04 01472 062677         IORST
05                      SDONE                  ;WITHOUT MUX SEL
06 01473 030102         LDA     2,TRADR        ;SET DONE
07 01474 071034         DOA     2,MUX          ;BY TURNING ON XMITTER
08 01475 102520         SUBZL   0,0
09 01476 063034         DOC     0,MUX
10 01477 102400         SUB     0,0
11 01500 060411         DIA     0,TTO
12 01501 024060         LDA     1,AMASK
13 01502 123414         AND#    1,0,SZR
14                      EHALT                  ;CHECK MUX SEL INPUT TO
15 01503 006230         JSR@    IERR?
16 01504 006231         LOOPX                  ;MUX SEL-DIA GATE, ALSO UDIA TO
17                                             ;PRI DINA
18 01505 006226 A022:   JSR@    IENT?          ;BIT 15 SHOULD NOT
19 01506 000005         5
20 01507 062677         IORST
21                      SDONE                  ;BE READ IN WITH DIC-
22 01510 030102         LDA     2,TRADR        ;SET DONE
23 01511 071034         DOA     2,MUX          ;BY TURNING ON XMITTER
24 01512 102520         SUBZL   0,0
25 01513 063034         DOC     0,MUX
26                                             ;IF SO DIA ALWAYS TRUE
27 01514 101100         MOVL    0,0            ;DUMMY INSTRUCTION
28 01515 062434         DIC     0,MUX
29 01516 101232         MOVZR#  0,0,SZC
30                      EHALT                  ;CHECK DIA-MUX BD SEL GATE- ALSO
31 01517 006230         JSR@    IERR?
32 01520 006231         LOOPX                  ;DIC BIT 15,
33
34 01521 006226 A023:   JSR@    IENT?          ;ADDRESS ALL OTHER COMBINATIONS
35 01522 000005         5
36 01523 062677         IORST
37 01524 024350         LDA     1,CM6          ;OF BOUNDARY ADDRESSES AND
38 01525 044100         STA     1,TEMP         ;TRY TO CLEAR DONE WITH
39 01526 020327         LDA     0,C400         ;START PULSE ON ILLEGAL BOUNDARY
40 01527 040106         STA     0,TEM          ;ADDRESS
41                      SDONE
42 01530 030102         LDA     2,TRADR        ;SET DONE
43 01531 071034         DOA     2,MUX          ;BY TURNING ON XMITTER
44 01532 102520         SUBZL   0,0
45 01533 063034         DOC     0,MUX
46 01534 020106         LDA     0,TEM
47 01535 024075         LDA     1,BDADR        ;EXCLUSIVE OR ONE BIT OF BDADR
48 01536 131000         MOV     1,2            ;WITH MASK
49 01537 113520         ANDZL   0,2
50 01540 107000         ADD     0,1
51 01541 146400         SUB     2,1
52 01542 065134         DOAS    1,MUX
53 01543 063634         SKPDN   MUX
54                      EHALT                  ;CHECK BOARD ADDRESS DECODER
55 01544 006230         JSR@    IERR?
56 01545 101220         MOVZR   0,0            ;BDEN ALWAYS ON
57 01546 010100         ISZ     TEMP
58 01547 000760         JMP     A023+6
59 01550 006231         LOOPX
60
```

```
 0029  PSID
01 01551 006226 A025:   JSR@    IENT?           ;CHECK THAT DIA SETS BDEN
02 01552 000005         5
03 01553 062677         IORST
04                      SDONE
05 01554 030102         LDA     2,TRADR         ;SET DONE
06 01555 071034         DOA     2,MUX           ;BY TURNING ON XMITTER
07 01556 102520         SUBZL   0,0
08 01557 063034         DOC     0,MUX
09 01560 024272         LDA     1,C40
10 01561 133000         ADD     1,2
11 01562 071034         DOA     2,MUX
12 01563 060434         DIA     0,MUX           ;ADDRESS SOME ILLEGAL CONTROLLER
13 01564 030060         LDA     2,AMASK
14 01565 143400         AND     2,0
15 01566 024075         LDA     1,BDADR
16 01567 147400         AND     2,1
17 01570 122414         SUB#    1,0,SZR
18                      EHALT                   ;CHECK DIA TO BDEN
19 01571 006230         JSR@    IERR?
20 01572 006231         LOOPX
```

```
!0030  PSID
01                ;TRANSMITTER/RECEIVER TESTING
02
03 01573 006226 T000:   JSR@    IENT?           ;CHECK TRANSMIT BIT SET ON
04 01574 000005         5
05 01575 062677         IORST
06                      XMIT                    ;TRANSMIT INTERRUPT
07 01576 020102         LDA     0,TRADR         ;TURN ON TRANSMITTER
08 01577 061034         DOA     0,MUX
09 01600 102520         SUBZL   0,0             ;THIS SETS DONE
10 01601 063034         DOC     0,MUX
11 01602 101100         MOVL    0,0             ;DUMMY INSTRUCTION
12 01603 060434         DIA     0,MUX
13 01604 101233         MOVZR#  0,0,SNC
14                      EHALT                   ;CHECK  DATA15 FROM DIA,
15 01605 006230         JSR@    IERR?
16 01606 006231         LOOPX                   ;PRIORITY DECODER
17
18 01607 006226 T001:   JSR@    IENT?           ;CHECK CORRECT BOARD ADDRESS
19 01610 000005         5
20 01611 062677         IORST
21                      XMIT                    ;ON TRANSMIT INTERRUPT
22 01612 020102         LDA     0,TRADR         ;TURN ON TRANSMITTER
23 01613 061034         DOA     0,MUX
24 01614 102520         SUBZL   0,0             ;THIS SETS DONE
25 01615 063034         DOC     0,MUX
26 01616 101100         MOVL    0,0             ;DUMMY INSTRUCTION
27 01617 024102         LDA     1,TRADR
28 01620 060434         DIA     0,MUX
29 01621 122414         SUB#    1,0,SZR
30                      EHALT                   ;CHECK IMPAD7 TO DIA INPUT,
31 01622 006230         JSR@    IERR?
32 01623 006231         LOOPX                   ;FROM PRIORITY DECODER, SCAN ADDR 7
33                                              ;TO XON
34 01624 006226 T003:   JSR@    IENT?           ;CLEAR DONE WITH CLEAR PULSE
35 01625 000005         5
36 01626 062677         IORST
37                      XMIT
38 01627 020102         LDA     0,TRADR         ;TURN ON TRANSMITTER
39 01630 061034         DOA     0,MUX
40 01631 102520         SUBZL   0,0             ;THIS SETS DONE
41 01632 063034         DOC     0,MUX
42 01633 101100         MOVL    0,0             ;DUMMY INSTRUCTION
43 01634 060634         DIAC    0,MUX
44 01635 101100         MOVL    0,0             ;DUMMY INSTRUCTION
45 01636 063734         SKPDZ   MUX
46                      EHALT                   ;"XCLR" TO XMT DN FLOP AND XCLR
47 01637 006230         JSR@    IERR?
48 01640 006231         LOOPX                   ;DECODING, CLEAR TO MUX BD RES
49                                              ;-(RCV STAT),
50                                              ;MODEMS ARE NOT CLEARED-
51                                              ;(IF APPLICABLE)
52
53 01641 006226 T004:   JSR@    IENT?           ;DO NOT RESET DONE
54 01642 000005         5
55 01643 062677         IORST
56                      XMIT                    ;WITH A CLEAR DEVICE 0
57 01644 020102         LDA     0,TRADR         ;TURN ON TRANSMITTER
58 01645 061034         DOA     0,MUX
59 01646 102520         SUBZL   0,0             ;THIS SETS DONE
60 01647 063034         DOC     0,MUX
```

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 0031  PSID
01 01650 101100          MOVL    0,0             ;DUMMY INSTRUCTION
02 01651 060434          DIA     0,MUX
03 01652 060200          NIOC    0
04 01653 101100          MOVL    0,0             ;DUMMY INSTRUCTION
05 01654 063634          SKPDN   MUX
06                       EHALT                   ;MUX BD SEL TO -(CLEAR MUX)
07 01655 006230          JSR@    IERR?
08 01656 006231          LOOPX
09
10 01657 006226 T005:    JSR@    IENT?           ;DO NOT SET XMIT DONE WITH
11 01660 000005          5
12 01661 062677          IORST
13                       ADROUT                  ;RECEIVER PROGRAMMED
14 01662 030101          LDA     2,RECADR        ;ADDRESS CORRECT
15 01663 071034          DOA     2,MUX           ;BOARD
16 01664 102520          SUBZL   0,0
17 01665 063034          DOC     0,MUX
18 01666 101100          MOVL    0,0             ;DUMMY INSTRUCTION
19 01667 101100          MOVL    0,0             ;DUMMY INSTRUCTION
20 01670 063734          SKPDZ   MUX
21                       EHALT                   ; TXENABLE
22 01671 006230          JSR@    IERR?
23 01672 006231          LOOPX
24
25 01673 006226 T006:    JSR@    IENT?           ;DO NOT SET XMIT DONE WITH
26 01674 000005          5
27 01675 062677          IORST
28 01676 020102          LDA     0,TRADR         ;XMIT BIT OFF
29 01677 061034          DOA     0,MUX
30 01700 102400          SUB     0,0
31 01701 063034          DOC     0,MUX
32 01702 101100          MOVL    0,0             ;DUMMY INSTRUCTION
33 01703 101100          MOVL    0,0             ;DUMMY INSTRUCTION
34 01704 063734          SKPDZ   MUX
35                       EHALT                   ;XON LOGIC
36 01705 006230          JSR@    IERR?
37 01706 006231          LOOPX                   ;DATA15 TO TXENABLE
38
39
40 01707 006226 T007:    JSR@    IENT?           ;NO XMIT DONE WITH DATA0
41 01710 000005          5
42 01711 062677          IORST
43 01712 020102          LDA     0,TRADR
44 01713 061034          DOA     0,MUX
45 01714 102620          SUBZR   0,0
46 01715 101400          INC     0,0
47 01716 063034          DOC     0,MUX
48 01717 101100          MOVL    0,0             ;DUMMY INSTRUCTION
49 01720 101100          MOVL    0,0             ;DUMMY INSTRUCTION
50 01721 063734          SKPDZ   MUX
51                       EHALT                   ;DATA0 INPUT TO DOC ROM
52 01722 006230          JSR@    IERR?
53 01723 006231          LOOPX
54
55 01724 006226 T008:    JSR@    IENT?           ;NO XMIT DONE WITH DATA1
56 01725 000005          5
57 01726 062677          IORST
58 01727 020102          LDA     0,TRADR
59 01730 061034          DOA     0,MUX
60 01731 020334          LDA     0,C40001
```

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 0032  PSID
01 01732 063034          DOC     0,MUX
02 01733 101100          MOVL    0,0             ;DUMMY INSTRUCTION
03 01734 101100          MOVL    0,0             ;DUMMY INSTRUCTION
04 01735 063734          SKPDZ   MUX
05                       EHALT                   ;DATA1 INPUT TO DOC ROM
06 01736 006230          JSR@    IERR?
07 01737 006231          LOOPX
08
09 01740 006226 T009:    JSR@    IENT?           ;DON'T CLEAR XMIT DONE WITH
10 01741 000005          5
11 01742 062677          IORST
12                       XMIT                    ;A MODEM CLEAR
13 01743 020102          LDA     0,TRADR         ;TURN ON TRANSMITTER
14 01744 061034          DOA     0,MUX
15 01745 102520          SUBZL   0,0             ;THIS SETS DONE
16 01746 063034          DOC     0,MUX
17 01747 101100          MOVL    0,0             ;DUMMY INSTRUCTION
18 01750 060434          DIA     0,MUX
19 01751 024101          LDA     1,RECADR
20 01752 065234          DOAC    1,MUX
21 01753 101100          MOVL    0,0             ;DUMMY INSTRUCTION
22 01754 063634          SKPDN   MUX
23                       EHALT                   ;XCLR
24 01755 006230          JSR@    IERR?
25 01756 006231          LOOPX
26 01757 006226 T010:    JSR@    IENT?           ;TRY TO TURN ON XMITTER
27 01760 000005          5
28 01761 062677          IORST
29 01762 020102          LDA     0,TRADR         ;WITHOUT DOC
30 01763 061034          DOA     0,MUX
31 01764 102520          SUBZL   0,0
32 01765 060034          NIO     MUX
33 01766 101100          MOVL    0,0             ;DUMMY INSTRUCTION
34 01767 063734          SKPDZ   MUX
35                       EHALT                   ;-(DOC) TO DOC ROM
36 01770 006230          JSR@    IERR?
37 01771 006231          LOOPX
38
39 01772 006226 T011:    JSR@    IENT?           ;DON'T CLEAR WRONG LINE
40 01773 000005          5
41 01774 062677          IORST
42                       XMIT
43 01775 020102          LDA     0,TRADR         ;TURN ON TRANSMITTER
44 01776 061034          DOA     0,MUX
45 01777 102520          SUBZL   0,0             ;THIS SETS DONE
46 02000 063034          DOC     0,MUX
47 02001 024104          LDA     1,OTADR
48 02002 065234          DOAC    1,MUX
49 02003 101100          MOVL    0,0             ;DUMMY INSTRUCTION
50 02004 063634          SKPDN   MUX
51                       EHALT                   ;SCAN ADDR 7 TO XCLR
52 02005 006230          JSR@    IERR?
53 02006 006231          LOOPX
54
55 02007 020105 TCLK0:   LDA     0,SWITCH        ;FORGET CLOCK TESTS IF
56 02010 101004          MOV     0,0,SZR         ;THIS IS A REPEAT
57 02011 002130          JMP@    ITR01
58
59 02012 006226          JSR@    IENT?           ;CHECK RESET TO ICLK
60 02013 000005          5
```

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 0033  PSID
01 02014 062677           IORST
02                        XMIT
03 02015 020102           LDA     0,TRADR         ;TURN ON TRANSMITTER
04 02016 061034           DOA     0,MUX
05 02017 102520           SUBZL   0,0             ;THIS SETS DONE
06 02020 063034           DOC     0,MUX
07                        CLCHK   SZR
08 02021 060434           DIA     0,MUX
09 02022 062434           DIC     0,MUX
10 02023 024073           LDA     1,.CMSK
11 02024 123414           AND#    1,0,SZR
12                        EHALT                   ;CHECK TRANSMIT CLOCK
13 02025 006230           JSR@    IERR?
14 02026 006231           LOOPX                   ;COUNTERS
15                                                ;CHECK DIC INPUT GATE FOR -(ICLK),
16                                                ;RESET TO ICLK COUNTERS
17 02027 000403           JMP     TCLK1
18
19 02030 017777 K100:     8192.-1 ;AT 600 BAUD 8192. IS EXACTLY 2 COMPLETE CYCLES OF ICLK
20 02031 020000 K101:     8192.   ;AT FASTER BAUD RATE MORE CYCLES OCCUR BUT ALWAYS IN MULTIPLES
21 02032 006226 TCLK1:    JSR@    IENT?           ;CHECK N-1 CLOCK COUNTS FOR NO
22 02033 000005           5
23 02034 062677           IORST
24                        XMIT                    ;TRANSITION (ENDS ON 1/2 CYCLE)
25 02035 020102           LDA     0,TRADR         ;TURN ON TRANSMITTER
26 02036 061034           DOA     0,MUX
27 02037 102520           SUBZL   0,0             ;THIS SETS DONE
28 02040 063034           DOC     0,MUX
29                        CLCNT   K100
30 02041 020767           LDA     0,K100
31 02042 024113           LDA     1,FCOUNT
32 02043 123000           ADD     1,0
33 02044 100400           NEG     0,0
34 02045 060335           NIOP    CRC
35 02046 101404           INC     0,0,SZR
36 02047 000776           JMP     .-2
37                        CLCHK   SZR
38 02050 060434           DIA     0,MUX
39 02051 062434           DIC     0,MUX
40 02052 024073           LDA     1,.CMSK
41 02053 123414           AND#    1,0,SZR
42                        EHALT                   ;CHECK TRANSMIT CLOCK
43 02054 006230           JSR@    IERR?
44 02055 006231           LOOPX                   ;COUNTERS
45
46 02056 006226 TCLK2:    JSR@    IENT?           ;CHECK N CLOCKS FOR A
47 02057 000005           5
48 02060 062677           IORST
49                        XMIT                    ;TRANSITION (ENDS ON 1/2 CYCLE)
50 02061 020102           LDA     0,TRADR         ;TURN ON TRANSMITTER
51 02062 061034           DOA     0,MUX
52 02063 102520           SUBZL   0,0             ;THIS SETS DONE
53 02064 063034           DOC     0,MUX
54                        CLCNT   K101
55 02065 020744           LDA     0,K101
56 02066 024113           LDA     1,FCOUNT
57 02067 123000           ADD     1,0
58 02070 100400           NEG     0,0
59 02071 060335           NIOP    CRC
60 02072 101404           INC     0,0,SZR
```

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 0034  PSID
01 02073 000776          JMP     .-2
02                       CLCHK   SNR
03 02074 060434          DIA     0,MUX
04 02075 062434          DIC     0,MUX
05 02076 024073          LDA     1,.CMSK
06 02077 123415          AND#    1,0,SNR
07                       EHALT                   ;CHECK TRANSMIT CLOCK
08 02100 006230          JSR@    IERR?
09 02101 006231          LOOPX                   ;COUNTERS
10                                               ;MUX BD DINC, ONLINE FLOP,
11                                               ;CRC DECODING
12 02102 006226 TCLK3:   JSR@    IENT?          ;CHECK 2N-1 CLOCKS (ENDS ON COMPLETE CYCLE)
13 02103 000005          5
14 02104 062677          IORST
15                       XMIT
16 02105 020102          LDA     0,TRADR        ;TURN ON TRANSMITTER
17 02106 061034          DOA     0,MUX
18 02107 102520          SUBZL   0,0            ;THIS SETS DONE
19 02110 063034          DOC     0,MUX
20 02111 020717          LDA     0,K100
21 02112 024113          LDA     1,FCOUNT
22 02113 125120          MOVZL   1,1
23 02114 123000          ADD     1,0
24 02115 100400          NEG     0,0
25 02116 060335          NIOP    CRC
26 02117 101404          INC     0,0,SZR
27 02120 000776          JMP     .-2
28                       CLCHK   SNR
29 02121 060434          DIA     0,MUX
30 02122 062434          DIC     0,MUX
31 02123 024073          LDA     1,.CMSK
32 02124 123415          AND#    1,0,SNR
33                       EHALT                   ;CHECK TRANSMIT CLOCK
34 02125 006230          JSR@    IERR?
35 02126 006231          LOOPX                   ;COUNTERS
36
37 02127 006226 TCLK4:   JSR@    IENT?          ;CHECK 2N CLOCK COUNTS (ENDS ON COMPLETE CYCLE)
38 02130 000005          5
39 02131 062677          IORST
40                       XMIT
41 02132 020102          LDA     0,TRADR        ;TURN ON TRANSMITTER
42 02133 061034          DOA     0,MUX
43 02134 102520          SUBZL   0,0            ;THIS SETS DONE
44 02135 063034          DOC     0,MUX
45 02136 020673          LDA     0,K101
46 02137 024113          LDA     1,FCOUNT
47 02140 125120          MOVZL   1,1
48 02141 123000          ADD     1,0
49 02142 100400          NEG     0,0
50 02143 060335          NIOP    CRC
51 02144 101404          INC     0,0,SZR
52 02145 000776          JMP     .-2
53                       CLCHK   SZR
54 02146 060434          DIA     0,MUX
55 02147 062434          DIC     0,MUX
56 02150 024073          LDA     1,.CMSK
57 02151 123414          AND#    1,0,SZR
58                       EHALT                   ;CHECK TRANSMIT CLOCK
59 02152 006230          JSR@    IERR?
60 02153 006231          LOOPX                   ;COUNTERS
```

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 0035  PS ID
01 02154 006226 TCLK5:  JSR@    IENT?           ;IOPLS W/O CRC SHOULD NOT
02 02155 000005         5
03 02156 062677         IORST
04                                              ;STEP ICLK- USE N COUNTS
05                      XMIT                    ;AS TEST
06 02157 020102         LDA     0,TRADR         ;TURN ON TRANSMITTER
07 02160 061034         DOA     0,MUX
08 02161 102520         SUBZL   0,0             ;THIS SETS DONE
09 02162 063034         DOC     0,MUX
10 02163 020646         LDA     0,K101
11 02164 024113         LDA     1,FCOUNT
12 02165 123000         ADD     1,0
13 02166 100400         NEG     0,0
14 02167 060300         NIOP    0               ;IOPLS W/O CRC
15 02170 101404         INC     0,0,SZR
16 02171 000776         JMP     .-2
17                      CLCHK   SZR
18 02172 060434         DIA     0,MUX
19 02173 062434         DIC     0,MUX
20 02174 024073         LDA     1,.CMSK
21 02175 123414         AND#    1,0,SZR
22                      EHALT                   ;CHECK TRANSMIT CLOCK
23 02176 006230         JSR@    IERR?
24 02177 006231         LOOPX                   ;COUNTERS
25                                              ;CRC TO IOPLS
26
27 02200 006226 TCLK6:  JSR@    IENT?           ;DON'T ALLOW ICLK BIT
28 02201 000005         5
29 02202 062677         IORST
30                                              ;THROUGH ON BUS WHEN
31                      XMIT                    ;ON LINE
32 02203 020102         LDA     0,TRADR         ;TURN ON TRANSMITTER
33 02204 061034         DOA     0,MUX
34 02205 102520         SUBZL   0,0             ;THIS SETS DONE
35 02206 063034         DOC     0,MUX
36                      CLCNT   K101
37 02207 020622         LDA     0,K101
38 02210 024113         LDA     1,FCOUNT
39 02211 123000         ADD     1,0
40 02212 100400         NEG     0,0
41 02213 060335         NIOP    CRC
42 02214 101404         INC     0,0,SZR
43 02215 000776         JMP     .-2
44 02216 060634         DIAC    0,MUX           ;GO ONLINE
45 02217 062434         DIC     0,MUX
46 02220 024073         LDA     1,.CMSK
47 02221 123414         AND#    1,0,SZR
48                      EHALT                   ;-(ONLINE) TO ICLK
49 02222 006230         JSR@    IERR?
50 02223 006231         LOOPX                   ; AT DIC MUX
51 02224 006226 TR01:   JSR@    IENT?           ;CHECK XDAT LINE HIGH
52 02225 000005         5
53 02226 062677         IORST
54                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
55 02227 006155         JSR@    ITRMT
56 02230 100031 100000+LOOPBACK+NOPARITY+CODE8
57                      MUXCLKA C4
58 02231 020240         LDA     0,C4
59 02232 006121         JSR     @ICONT
60                      CHECK   SNR
```

```
 0036  PSID
01 02233 060434          DIA     0,MUX
02 02234 062434          DIC     0,MUX
03 02235 024072          LDA     1,XMSK
04 02236 123415          AND#    1,0,SNR
05                       EHALT                   ;CHECK XMIT START LOGIC, XDAT,
06 02237 006230          JSR@    IERR?
07 02240 006231          LOOPX                   ;DIC INPUT
08
09 02241 006226 TR02:    JSR@    IENT?           ;CHECK XDAT STILL HIGH
10 02242 000005          5
11 02243 062677          IORST
12                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
13 02244 006155          JSR@    ITRMT
14 02245 100031 100000+LOOPBACK+NOPARITY+CODE8
15                       XCLK    C1
16 02246 020235          LDA     0,C1
17 02247 006123          JSR     @.STEP
18                       MUXCLKA C4
19 02250 020240          LDA     0,C4
20 02251 006121          JSR     @ICONT
21                       CHECK   SNR
22 02252 060434          DIA     0,MUX
23 02253 062434          DIC     0,MUX
24 02254 024072          LDA     1,XMSK
25 02255 123415          AND#    1,0,SNR
26                       EHALT                   ;CHECK XMIT START LOGIC
27 02256 006230          JSR@    IERR?
28 02257 006231          LOOPX
29
30 02260 006226 TR03:    JSR@    IENT?           ;CHECK FIRST BIT TRANSMITTED
31 02261 000005          5
32 02262 062677          IORST
33 02263 020102          LDA     0,TRADR         ;WRITE XMIT REG. FILE TO
34 02264 061034          DOA     0,MUX           ;INITIAL VALUES
35 02265 024302          LDA     1,C125
36 02266 066034          DOB     1,MUX
37 02267 024344          LDA     1,C140125       ;DLE CHARACTER
38 02270 067034          DOC     1,MUX
39 02271 024337          LDA     1,C40252        ;SYN CHARACTER
40 02272 067034          DOC     1,MUX
41                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
42 02273 006155          JSR@    ITRMT
43 02274 100031 100000+LOOPBACK+NOPARITY+CODE8
44                       XCLK    C1
45 02275 020235          LDA     0,C1
46 02276 006123          JSR     @.STEP
47                       MUXCLKA C1
48 02277 020235          LDA     0,C1
49 02300 006121          JSR     @ICONT
50                       XCLK    C1
51 02301 020235          LDA     0,C1
52 02302 006123          JSR     @.STEP
53                       MUXCLKA C5
54 02303 020241          LDA     0,C5
55 02304 006121          JSR     @ICONT
56 02305 062677          IORST
57                       CHECK   SZR
58 02306 060434          DIA     0,MUX
59 02307 062434          DIC     0,MUX
60 02310 024072          LDA     1,XMSK
```

```
 0037  PSID
01 02311 123414          AND#    1,0,SZR
02                       EHALT                   ;XDAT TO DIC, XFILE LOOPX-
03 02312 006230          JSR@    IERR?
04 02313 006231          LOOPX                   ;BACK, -(CTS), XMIT SHIFT
05                                               ;REGISTER , ROM, -(LOAD), DOB,
06                                               ;DIAG XMIT CLOCK, EQZ
07                                               ;CHECK XDAT FIRST, THEN LOAD,
08                                               ;THEN RA1, RA0, OF ROM
09                                               ;MUX CLKA, IOPLS, XON
10
11 02314 020110          LDA     0,THING         ;RUN BAUD CLOCK
12 02315 101004          MOV     0,0,SZR         ;RUN ONLY?
13 02316 002402          JMP@    .+2             ;YES
14 02317 000402          JMP     .+2             ;NO
15 02320 016033          ENDC
16               TR3B:   SYNC    SY000   ;CHECK XDAT W/O MUX CLKA'S,
17 02321 006226          JSR@    IENT?
18 02322 000005          5
19 02323 062677          IORST
20                       ADROUT
21 02324 030101          LDA     2,RECADR        ;ADDRESS CORRECT
22 02325 071034          DOA     2,MUX           ;BOARD
23 02326 020366          LDA     0,SY000
24 02327 063034          DOC     0,MUX
25 02330 151400          INC     2,2
26 02331 071034          DOA     2,MUX
27 02332 063034          DOC     0,MUX
28                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
29 02333 006155          JSR@    ITRMT
30 02334 100031 100000+LOOPBACK+NOPARITY+CODE8
31 02335 102400          SUB     0,0
32 02336 062034          DOB     0,MUX
33                       CHECK   SNR
34 02337 060434          DIA     0,MUX
35 02340 062434          DIC     0,MUX
36 02341 024072          LDA     1,XMSK
37 02342 123415          AND#    1,0,SNR
38                       EHALT                   ;CLOCK RUNNING CONTINUOUSLY
39 02343 006230          JSR@    IERR?
40 02344 006231          LOOPX                   ;CHECK ONLINE TO MUX CLKA, XCLK
41                                               ;XDAT
42 02345 000403          JMP     TR3C
43
44 02346 040377 SY377:   40377
45 02347 040252 SY252:   40252
46               TR3C:   SYNC    SY000           ;DO NOT GET MUX CLKA
47 02350 006226          JSR@    IENT?
48 02351 000005          5
49 02352 062677          IORST
50                       ADROUT
51 02353 030101          LDA     2,RECADR        ;ADDRESS CORRECT
52 02354 071034          DOA     2,MUX           ;BOARD
53 02355 020366          LDA     0,SY000
54 02356 063034          DOC     0,MUX
55 02357 151400          INC     2,2
56 02360 071034          DOA     2,MUX
57 02361 063034          DOC     0,MUX
58                                               ;WITHOUT MUX BD SEL
59                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
60 02362 006155          JSR@    ITRMT
```

```
 0038  PSID
01 02363 100031 100000+LOOPBACK+NOPARITY+CODE8
02                      XCLK    C1              ;LOAD ZEROS  IN SHIFT REGISTER
03 02364 020235         LDA     0,C1
04 02365 006123         JSR     @.STEP
05                      MUXCLKA C1
06 02366 020235         LDA     0,C1
07 02367 006121         JSR     @ICONT
08                      XCLK    C1
09 02370 020235         LDA     0,C1
10 02371 006123         JSR     @.STEP
11                      MUXCLKA C5
12 02372 020241         LDA     0,C5
13 02373 006121         JSR     @ICONT
14 02374 102400         SUB     0,0             ;TURN OFF TRANSMITTER AND START
15 02375 063034         DOC     0,MUX           ;AGAIN
16 02376 000404         JMP     .+4             ;SETUP NOT USED
17                      SYNC    SY377
18 02377 006226         JSR@    IENT?
19 02400 000005         5
20 02401 062677         IORST
21                      ADROUT
22 02402 030101         LDA     2,RECADR        ;ADDRESS CORRECT
23 02403 071034         DOA     2,MUX           ;BOARD
24 02404 020742         LDA     0,SY377
25 02405 063034         DOC     0,MUX
26 02406 151400         INC     2,2
27 02407 071034         DOA     2,MUX
28 02410 063034         DOC     0,MUX
29 02411 000401         JMP     .+1
30 02412 102520         SUBZL   0,0
31 02413 063034         DOC     0,MUX
32                      XCLK    C1
33 02414 020235         LDA     0,C1
34 02415 006123         JSR     @.STEP
35                      MUXCLKA C1
36 02416 020235         LDA     0,C1
37 02417 006121         JSR     @ICONT
38                      XCLK    C1
39 02420 020235         LDA     0,C1
40 02421 006123         JSR     @.STEP
41 02422 020102         LDA     0,TRADR
42 02423 024272         LDA     1,C40
43 02424 123000         ADD     1,0
44 02425 061034         DOA     0,MUX           ;ADDRESS ANOTHER BOARD
45                      MUXCLKA C5
46 02426 020241         LDA     0,C5
47 02427 006121         JSR     @ICONT
48                      CHECK   SZR
49 02430 060434         DIA     0,MUX
50 02431 062434         DIC     0,MUX
51 02432 024072         LDA     1,XMSK
52 02433 123414         AND#    1,0,SZR
53                      EHALT                   ;MUX BD SEL TO IOPLS
54 02434 006230         JSR@    IERR?
55 02435 006231         LOOPX
56              TR3F:   SYNC    SY377           ;XDAT IS LOW WITHOUT DIAG
57 02436 006226         JSR@    IENT?
58 02437 000005         5
59 02440 062677         IORST
60                      ADROUT
```

```
 0039  PSID
01 02441 030101          LDA     2,RECADR          ;ADDRESS CORRECT
02 02442 071034          DOA     2,MUX             ;BOARD
03 02443 020703          LDA     0,SY377
04 02444 063034          DOC     0,MUX
05 02445 151400          INC     2,2
06 02446 071034          DOA     2,MUX
07 02447 063034          DOC     0,MUX
08                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
09 02450 006155          JSR@    ITRMT
10 02451 100031 100000+LOOPBACK+NOPARITY+CODE8
11 02452 020326          LDA     0,C377
12 02453 062234          DOBC    0,MUX             ;GO ONLINE
13 02454 020102          LDA     0,TRADR
14 02455 061034          DOA     0,MUX
15 02456 062434          DIC     0,MUX
16 02457 024072          LDA     1,XMSK
17 02460 123414          AND#    1,0 SZR
18                       EHALT                     ;CHECK -(ONLINE) TO XDAT
19 02461 006230          JSR@    IERR?
20 02462 006231          LOOPX                     ;-(CLEAR MUX) TO ONLINE FLOP
21
22               TR3A:   SYNC    SY252             ;TURN XON OFF- DOES
23 02463 006226          JSR@    IENT?
24 02464 000005          5
25 02465 062677          IORST
26                       ADROUT
27 02466 030101          LDA     2,RECADR          ;ADDRESS CORRECT
28 02467 071034          DOA     2,MUX             ;BOARD
29 02470 020657          LDA     0,SY252
30 02471 063034          DOC     0,MUX
31 02472 151400          INC     2,2
32 02473 071034          DOA     2,MUX
33 02474 063034          DOC     0,MUX
34                                                 ;XDAT GO HIGH?
35                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
36 02475 006155          JSR@    ITRMT
37 02476 100031 100000+LOOPBACK+NOPARITY+CODE8
38                       XCLK    C1
39 02477 020235          LDA     0,C1
40 02500 006123          JSR     @.STEP
41                       MUXCLKA C1
42 02501 020235          LDA     0,C1
43 02502 006121          JSR     @ICONT
44                       XCLK    C1
45 02503 020235          LDA     0,C1
46 02504 006123          JSR     @.STEP
47                       MUXCLKA C5
48 02505 020241          LDA     0,C5
49 02506 006121          JSR     @ICONT
50 02507 060434          DIA     0,MUX
51 02510 102400          SUB     0,0
52 02511 063034          DOC     0,MUX
53 02512 062434          DIC     0,MUX
54 02513 024072          LDA     1,XMSK
55 02514 123415          AND#    1,0,SNR
56                       EHALT                     ;NO, XON TO RESET OF
57 02515 006230          JSR@    IERR?
58 02516 006231          LOOPX                     ;XMIT START LOGIC
59               TR04:   BITCHECK        2,C2,SNR
60 02517 006226          JSR@    IENT?             ;XMIT SHIFT TO BIT 2
```

```
 0040  PSID
01 02520 000005          5
02 02521 062677          IORST
03                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
04 02522 006155          JSR@    ITRMT
05 02523 100031 100000+LOOPBACK+NOPARITY+CODE8
06                       XCLK    C1
07 02524 020235          LDA     0,C1
08 02525 006123          JSR     @.STEP
09                       MUXCLKA C1
10 02526 020235          LDA     0,C1
11 02527 006121          JSR     @ICONT
12                       XCLK    C1
13 02530 020235          LDA     0,C1
14 02531 006123          JSR     @.STEP
15                       MUXCLKA C5
16 02532 020241          LDA     0,C5
17 02533 006121          JSR     @ICONT
18                       XCLK    C2
19 02534 020236          LDA     0,C2
20 02535 006123          JSR     @.STEP
21                       CHECK   SNR
22 02536 060434          DIA     0,MUX
23 02537 062434          DIC     0,MUX
24 02540 024072          LDA     1,XMSK
25 02541 123415          AND#    1,0,SNR
26                       EHALT                   ;XMIT BIT 2 INCORRECT FROM
27 02542 006230          JSR@    IERR?
28 02543 006231          LOOPX                   ;SHIFT REGISTER-
29                                               ;DATA BIT 2 IN STORAGE
30                                               ;RESET TO DIAG CLOCK, XCLK
31                                               ;TO SHIFT REGISTER, -(LOAD),
32                                               ;XFILE, PRESET TO LOADER
33
34               TR05:   BITCHECK        3,C4,SZR
35 02544 006226          JSR@    IENT?           ;XMIT SHIFT TO BIT 3
36 02545 000005          5
37 02546 062677          IORST
38                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
39 02547 006155          JSR@    ITRMT
40 02550 100031 100000+LOOPBACK+NOPARITY+CODE8
41                       XCLK    C1
42 02551 020235          LDA     0,C1
43 02552 006123          JSR     @.STEP
44                       MUXCLKA C1
45 02553 020235          LDA     0,C1
46 02554 006121          JSR     @ICONT
47                       XCLK    C1
48 02555 020235          LDA     0,C1
49 02556 006123          JSR     @.STEP
50                       MUXCLKA C5
51 02557 020241          LDA     0,C5
52 02560 006121          JSR     @ICONT
53                       XCLK    C4
54 02561 020240          LDA     0,C4
55 02562 006123          JSR     @.STEP
56                       CHECK   SZR
57 02563 060434          DIA     0,MUX
58 02564 062434          DIC     0,MUX
59 02565 024072          LDA     1,XMSK
60 02566 123414          AND#    1,0,SZR
```

```
 0041  PSID
01                      EHALT                   ;XMIT BIT 3 INCORRECT FROM
02 02567 006230         JSR@    IERR?
03 02570 006231         LOOPX                   ;SHIFT REGISTER-
04                                              ;DATA BIT 3 IN STORAGE
05
06              TR06:   BITCHECK        4,C6,SNR
07 02571 006226         JSR@    IENT?           ;XMIT SHIFT TO BIT 4
08 02572 000005         5
09 02573 062677         IORST
10                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
11 02574 006155         JSR@    ITRMT
12 02575 100031 100000+LOOPBACK+NOPARITY+CODE8
13                      XCLK    C1
14 02576 020235         LDA     0,C1
15 02577 006123         JSR     @.STEP
16                      MUXCLKA C1
17 02600 020235         LDA     0,C1
18 02601 006121         JSR     @ICONT
19                      XCLK    C1
20 02602 020235         LDA     0,C1
21 02603 006123         JSR     @.STEP
22                      MUXCLKA C5
23 02604 020241         LDA     0,C5
24 02605 006121         JSR     @ICONT
25                      XCLK    C6
26 02606 020242         LDA     0,C6
27 02607 006123         JSR     @.STEP
28                      CHECK   SNR
29 02610 060434         DIA     0,MUX
30 02611 062434         DIC     0,MUX
31 02612 024072         LDA     1,XMSK
32 02613 123415         AND#    1,0,SNR
33                      EHALT                   ;XMIT BIT 4 INCORRECT FROM
34 02614 006230         JSR@    IERR?
35 02615 006231         LOOPX                   ;SHIFT REGISTER-
36                                              ;DATA BIT 4 IN STORAGE
37              TR07:   BITCHECK        5,C8.,SZR
38 02616 006226         JSR@    IENT?           ;XMIT SHIFT TO BIT 5
39 02617 000005         5
40 02620 062677         IORST
41                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
42 02621 006155         JSR@    ITRMT
43 02622 100031 100000+LOOPBACK+NOPARITY+CODE8
44                      XCLK    C1
45 02623 020235         LDA     0,C1
46 02624 006123         JSR     @.STEP
47                      MUXCLKA C1
48 02625 020235         LDA     0,C1
49 02626 006121         JSR     @ICONT
50                      XCLK    C1
51 02627 020235         LDA     0,C1
52 02630 006123         JSR     @.STEP
53                      MUXCLKA C5
54 02631 020241         LDA     0,C5
55 02632 006121         JSR     @ICONT
56                      XCLK    C8.
57 02633 020244         LDA     0,C8.
58 02634 006123         JSR     @.STEP
59                      CHECK   SZR
60 02635 060434         DIA     0,MUX
```

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 0042  PSID
01 02636 062434          DIC     0,MUX
02 02637 024072          LDA     1,XMSK
03 02640 123414          AND#    1,0,SZR
04                       EHALT                   ;XMIT BIT 5 INCORRECT FROM
05 02641 006230          JSR@    IERR?
06 02642 006231          LOOPX                   ;SHIFT REGISTER-
07                                               ;DATA BIT 5 IN STORAGE
08
09               TR08:   BITCHECK        6,C10.,SNR
10 02643 006226          JSR@    IENT?           ;XMIT SHIFT TO BIT 6
11 02644 000005          5
12 02645 062677          IORST
13                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
14 02646 006155          JSR@    ITRMT
15 02647 100031 100000+LOOPBACK+NOPARITY+CODE8
16                       XCLK    C1
17 02650 020235          LDA     0,C1
18 02651 006123          JSR     @.STEP
19                       MUXCLKA C1
20 02652 020235          LDA     0,C1
21 02653 006121          JSR     @ICONT
22                       XCLK    C1
23 02654 020235          LDA     0,C1
24 02655 006123          JSR     @.STEP
25                       MUXCLKA C5
26 02656 020241          LDA     0,C5
27 02657 006121          JSR     @ICONT
28                       XCLK    C10.
29 02660 020246          LDA     0,C10.
30 02661 006123          JSR     @.STEP
31                       CHECK   SNR
32 02662 060434          DIA     0,MUX
33 02663 062434          DIC     0,MUX
34 02664 024072          LDA     1,XMSK
35 02665 123415          AND#    1,0,SNR
36                       EHALT                   ;XMIT BIT 6 INCORRECT FROM
37 02666 006230          JSR@    IERR?
38 02667 006231          LOOPX                   ;SHIFT REGISTER-
39                                               ;DATA BIT 6 IN STORAGE
40               TR09:   BITCHECK        7,C12.,SZR
41 02670 006226          JSR@    IENT?           ;XMIT SHIFT TO BIT 7
42 02671 000005          5
43 02672 062677          IORST
44                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
45 02673 006155          JSR@    ITRMT
46 02674 100031 100000+LOOPBACK+NOPARITY+CODE8
47                       XCLK    C1
48 02675 020235          LDA     0,C1
49 02676 006123          JSR     @.STEP
50                       MUXCLKA C1
51 02677 020235          LDA     0,C1
52 02700 006121          JSR     @ICONT
53                       XCLK    C1
54 02701 020235          LDA     0,C1
55 02702 006123          JSR     @.STEP
56                       MUXCLKA C5
57 02703 020241          LDA     0,C5
58 02704 006121          JSR     @ICONT
59                       XCLK    C12.
60 02705 020250          LDA     0,C12.
```

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 0043  PSID
01 02706 006123          JSR     @.STEP
02                       CHECK   SZR
03 02707 060434          DIA     0,MUX
04 02710 062434          DIC     0,MUX
05 02711 024072          LDA     1,XMSK
06 02712 123414          AND#    1,0,SZR
07                       EHALT                       ;XMIT BIT 7 INCORRECT FROM
08 02713 006230          JSR@    IERR?
09 02714 006231          LOOPX                       ;SHIFT REGISTER-
10                                                   ;DATA BIT 7 IN STORAGE
11
12               TR10:   BITCHECK        8.,C14.,SNR
13 02715 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 8.
14 02716 000005          5
15 02717 062677          IORST
16                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
17 02720 006155          JSR@    ITRMT
18 02721 100031 100000+LOOPBACK+NOPARITY+CODE8
19                       XCLK    C1
20 02722 020235          LDA     0,C1
21 02723 006123          JSR     @.STEP
22                       MUXCLKA C1
23 02724 020235          LDA     0,C1
24 02725 006121          JSR     @ICONT
25                       XCLK    C1
26 02726 020235          LDA     0,C1
27 02727 006123          JSR     @.STEP
28                       MUXCLKA C5
29 02730 020241          LDA     0,C5
30 02731 006121          JSR     @ICONT
31                       XCLK    C14.
32 02732 020252          LDA     0,C14.
33 02733 006123          JSR     @.STEP
34                       CHECK   SNR
35 02734 060434          DIA     0,MUX
36 02735 062434          DIC     0,MUX
37 02736 024072          LDA     1,XMSK
38 02737 123415          AND#    1,0,SNR
39                       EHALT                       ;XMIT BIT 8. INCORRECT FROM
40 02740 006230          JSR@    IERR?
41 02741 006231          LOOPX                       ;SHIFT REGISTER-
42                                                   ;DATA BIT 8. IN STORAGE
43                                                   ;ALSO CODE LEVEL DECODER,
44                                                   ;XMIT LOAD SHIFTER
45 02742 006226 TR11:    JSR@    IENT?               ;CHARACTER 2, BIT 1
46 02743 000005          5
47 02744 062677          IORST
48                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
49 02745 006155          JSR@    ITRMT
50 02746 100031 100000+LOOPBACK+NOPARITY+CODE8
51                       XCLK    C1
52 02747 020235          LDA     0,C1
53 02750 006123          JSR     @.STEP
54                       MUXCLKA C1
55 02751 020235          LDA     0,C1
56 02752 006121          JSR     @ICONT
57                       XCLK    C1
58 02753 020235          LDA     0,C1
59 02754 006123          JSR     @.STEP
60                       MUXCLKA C5
```

```
 0044  PSID
01 02755 020241          LDA     0,C5
02 02756 006121          JSR     @ICONT
03                       XCLK    C13.
04 02757 020251          LDA     0,C13.
05 02760 006123          JSR     @.STEP
06                       MUXCLKA C1
07 02761 020235          LDA     0,C1
08 02762 006121          JSR     @ICONT
09                       XCLK    C3
10 02763 020237          LDA     0,C3
11 02764 006123          JSR     @.STEP
12                       MUXCLKA C5
13 02765 020241          LDA     0,C5
14 02766 006121          JSR     @ICONT
15                       CHECK   SZR
16 02767 060434          DIA     0,MUX
17 02770 062434          DIC     0,MUX
18 02771 024072          LDA     1,XMSK
19 02772 123414          AND#    1,0,SZR
20                       EHALT                           ;XMIT LOAD SHIFTER, XMIT
21 02773 006230          JSR@    IERR?
22 02774 006231          LOOPX                           ;SHIFT REGISTER,
23                                                       ;LINE CHARACTERISTICS DECODING
24
25 02775 006226 TR12:    JSR@    IENT?                   ;CHARACTER 2, BIT 2
26 02776 000005          5
27 02777 062677          IORST
28                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
29 03000 006155          JSR@    ITRMT
30 03001 100031 100000+LOOPBACK+NOPARITY+CODE8
31                       XCLK    C1
32 03002 020235          LDA     0,C1
33 03003 006123          JSR     @.STEP
34                       MUXCLKA C1
35 03004 020235          LDA     0,C1
36 03005 006121          JSR     @ICONT
37                       XCLK    C1
38 03006 020235          LDA     0,C1
39 03007 006123          JSR     @.STEP
40                       MUXCLKA C5
41 03010 020241          LDA     0,C5
42 03011 006121          JSR     @ICONT
43                       XCLK    C13.
44 03012 020251          LDA     0,C13.
45 03013 006123          JSR     @.STEP
46                       MUXCLKA C1
47 03014 020235          LDA     0,C1
48 03015 006121          JSR     @ICONT
49                       XCLK    C3
50 03016 020237          LDA     0,C3
51 03017 006123          JSR     @.STEP
52                       MUXCLKA C5
53 03020 020241          LDA     0,C5
54 03021 006121          JSR     @ICONT
55                       XCLK    C2
56 03022 020236          LDA     0,C2
57 03023 006123          JSR     @.STEP
58                       CHECK   SNR
59 03024 060434          DIA     0,MUX
60 03025 062434          DIC     0,MUX
```

```
 0045  PSID
01 03026 024072          LDA     1,XMSK
02 03027 123415          AND#    1,0,SNR
03                       EHALT                   ;XMIT SHIFT REGISTER
04 03030 006230          JSR@    IERR?
05 03031 006231          LOOPX
06 03032 006226 TR13:    JSR@    IENT?           ;CHANGE SYNC WORD AND REPEAT
07 03033 000005          5
08 03034 062677          IORST
09 03035 020102          LDA     0,TRADR
10 03036 061034          DOA     0,MUX
11 03037 030117          LDA     2,UFLAG
12 03040 151004          MOV     2,2,SZR                 ;PSI/U?
13 03041 000410          JMP     .+8.                    ;NO
14 03042 024337          LDA     1,C40252        ;SYNC WORD(PSI/U)       ;IF BOARD IS CONFIGURED
15 03043 067034          DOC     1,MUX                                   ;PSI/1 AND PSI/2 THE SY
16 03044 024345          LDA     1,C140252       ;DLE WORD(PSI/U)        ;WILL BE OUTPUT AND THE
17 03045 067034          DOC     1,MUX                                   ;TESTED IN TR13 THRU TR
18 03046 030302          LDA     2,C125          ;TRANSMIT WORD(PSI/U)   ;IF BOARD IS CONFIGURED
19 03047 072034          DOB     2,MUX                                   ;PSI/U THE DATA WORD WI
20 03050 000407          JMP     .+7                                     ;OUTPUT AND TESTED
21 03051 024335          LDA     1,C40125                ;SYNC WORD(PSI/1 PSI/2)
22 03052 067034          DOC     1,MUX
23 03053 024345          LDA     1,C140252               ;DLE WORD(PSI/1 PSI/2)
24 03054 067034          DOC     1,MUX
25 03055 024314          LDA     1,C252                  ;TRANSMIT WORD(PSI/1 PSI/2)
26 03056 066034          DOB     1,MUX
27                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
28 03057 006155          JSR@    ITRMT
29 03060 100031 100000+LOOPBACK+NOPARITY+CODE8
30                       XCLK    C1
31 03061 020235          LDA     0,C1
32 03062 006123          JSR     @.STEP
33                       MUXCLKA C1
34 03063 020235          LDA     0,C1
35 03064 006121          JSR     @ICONT
36                       XCLK    C1
37 03065 020235          LDA     0,C1
38 03066 006123          JSR     @.STEP
39                       MUXCLKA C5
40 03067 020241          LDA     0,C5
41 03070 006121          JSR     @ICONT
42                       CHECK   SNR
43 03071 060434          DIA     0,MUX
44 03072 062434          DIC     0,MUX
45 03073 024072          LDA     1,XMSK
46 03074 123415          AND#    1,0,SNR
47                       EHALT                   ;XMIT BIT 1 FROM SHIFT
48 03075 006230          JSR@    IERR?
49 03076 006231          LOOPX                   ;REGISTER- BIT 1 IN STORAGE
50
51               TR14:   UBITCHECK       2,C2,SZR
52 03077 006226          JSR@    IENT?           ;XMIT SHIFT TO BIT 2
53 03100 000005          5
54 03101 062677          IORST
55 03102 030302          LDA     2,C125          ;TRANSMIT WORD (PSI/U)
56 03103 024117          LDA     1,UFLAG
57 03104 125005          MOV     1,1,SNR         ;PSI/U?
58 03105 072034          DOB     2,MUX           ;YES, LOAD TRANSMIT WORD
59                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
60 03106 006155          JSR@    ITRMT
```

```
 0046  PSID
01 03107 100031 100000+LOOPBACK+NOPARITY+CODE8
02                       XCLK     C1
03 03110 020235          LDA      0,C1
04 03111 006123          JSR      @.STEP
05                       MUXCLKA  C1
06 03112 020235          LDA      0,C1
07 03113 006121          JSR      @ICONT
08                       XCLK     C1
09 03114 020235          LDA      0,C1
10 03115 006123          JSR      @.STEP
11                       MUXCLKA  C5
12 03116 020241          LDA      0,C5
13 03117 006121          JSR      @ICONT
14                       XCLK     C2
15 03120 020236          LDA      0,C2
16 03121 006123          JSR      @.STEP
17                       CHECK    SZR
18 03122 060434          DIA      0,MUX
19 03123 062434          DIC      0,MUX
20 03124 024072          LDA      1,XMSK
21 03125 123414          AND#     1,0,SZR
22                       EHALT                        ;XMIT BIT 2 INCORRECT FROM
23 03126 006230          JSR@     IERR?
24 03127 006231          LOOPX                        ;SHIFT REGISTER-
25                                                    ;DATA BIT 2 IN STORAGE
26               TR15:   UBITCHECK        3,C4,SNR
27 03130 006226          JSR@     IENT?               ;XMIT SHIFT TO BIT 3
28 03131 000005          5
29 03132 062677          IORST
30 03133 030302          LDA      2,C125              ;TRANSMIT WORD (PSI/U)
31 03134 024117          LDA      1,UFLAG
32 03135 125005          MOV      1,1,SNR             ;PSI/U?
33 03136 072034          DOB      2,MUX               ;YES, LOAD TRANSMIT WORD
34                       TRANSMIT         LOOPBACK,NOPARITY,CODE8
35 03137 006155          JSR@     ITRMT
36 03140 100031 100000+LOOPBACK+NOPARITY+CODE8
37                       XCLK     C1
38 03141 020235          LDA      0,C1
39 03142 006123          JSR      @.STEP
40                       MUXCLKA  C1
41 03143 020235          LDA      0,C1
42 03144 006121          JSR      @ICONT
43                       XCLK     C1
44 03145 020235          LDA      0,C1
45 03146 006123          JSR      @.STEP
46                       MUXCLKA  C5
47 03147 020241          LDA      0,C5
48 03150 006121          JSR      @ICONT
49                       XCLK     C4
50 03151 020240          LDA      0,C4
51 03152 006123          JSR      @.STEP
52                       CHECK    SNR
53 03153 060434          DIA      0,MUX
54 03154 062434          DIC      0,MUX
55 03155 024072          LDA      1,XMSK
56 03156 123415          AND#     1,0,SNR
57                       EHALT                        ;XMIT BIT 3 INCORRECT FROM
58 03157 006230          JSR@     IERR?
59 03160 006231          LOOPX                        ;SHIFT REGISTER-
60                                                    ;DATA BIT 3 IN STORAGE
```

```
 0047  PSID
01
02                TR16:   UBITCHECK       4,C6,SZR
03 03161 006226           JSR@    IENT?           ;XMIT SHIFT TO BIT 4
04 03162 000005           5
05 03163 062677           IORST
06 03164 030302           LDA     2,C125          ;TRANSMIT WORD (PSI/U)
07 03165 024117           LDA     1,UFLAG
08 03166 125005           MOV     1,1,SNR         ;PSI/U?
09 03167 072034           DOB     2,MUX           ;YES, LOAD TRANSMIT WORD
10                        TRANSMIT        LOOPBACK,NOPARITY,CODE8
11 03170 006155           JSR@    ITRMT
12 03171 100031 100000+LOOPBACK+NOPARITY+CODE8
13                        XCLK    C1
14 03172 020235           LDA     0,C1
15 03173 006123           JSR     @.STEP
16                        MUXCLKA C1
17 03174 020235           LDA     0,C1
18 03175 006121           JSR     @ICONT
19                        XCLK    C1
20 03176 020235           LDA     0,C1
21 03177 006123           JSR     @.STEP
22                        MUXCLKA C5
23 03200 020241           LDA     0,C5
24 03201 006121           JSR     @ICONT
25                        XCLK    C6
26 03202 020242           LDA     0,C6
27 03203 006123           JSR     @.STEP
28                        CHECK   SZR
29 03204 060434           DIA     0,MUX
30 03205 062434           DIC     0,MUX
31 03206 024072           LDA     1,XMSK
32 03207 123414           AND#    1,0,SZR
33                        EHALT                   ;XMIT BIT 4 INCORRECT FROM
34 03210 006230           JSR@    IERR?
35 03211 006231           LOOPX                   ;SHIFT REGISTER-
36                                                ;DATA BIT 4 IN STORAGE
37                TR17:   UBITCHECK       5,C8.,SNR
38 03212 006226           JSR@    IENT?           ;XMIT SHIFT TO BIT 5
39 03213 000005           5
40 03214 062677           IORST
41 03215 030302           LDA     2,C125          ;TRANSMIT WORD (PSI/U)
42 03216 024117           LDA     1,UFLAG
43 03217 125005           MOV     1,1,SNR         ;PSI/U?
44 03220 072034           DOB     2,MUX           ;YES, LOAD TRANSMIT WORD
45                        TRANSMIT        LOOPBACK,NOPARITY,CODE8
46 03221 006155           JSR@    ITRMT
47 03222 100031 100000+LOOPBACK+NOPARITY+CODE8
48                        XCLK    C1
49 03223 020235           LDA     0,C1
50 03224 006123           JSR     @.STEP
51                        MUXCLKA C1
52 03225 020235           LDA     0,C1
53 03226 006121           JSR     @ICONT
54                        XCLK    C1
55 03227 020235           LDA     0,C1
56 03230 006123           JSR     @.STEP
57                        MUXCLKA C5
58 03231 020241           LDA     0,C5
59 03232 006121           JSR     @ICONT
60                        XCLK    C8.
```

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 0048  PSID
01 03233 020244          LDA     0,C8.
02 03234 006123          JSR     @.STEP
03                       CHECK   SNR
04 03235 060434          DIA     0,MUX
05 03236 062434          DIC     0,MUX
06 03237 024072          LDA     1,XMSK
07 03240 123415          AND#    1,0,SNR
08                       EHALT                       ;XMIT BIT 5 INCORRECT FROM
09 03241 006230          JSR@    IERR?
10 03242 006231          LOOPX                       ;SHIFT REGISTER-
11                                                   ;DATA BIT 5 IN STORAGE
12
13               TR18:   UBITCHECK       6,C10.,SZR
14 03243 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 6
15 03244 000005          5
16 03245 062677          IORST
17 03246 030302          LDA     2,C125              ;TRANSMIT WORD (PSI/U)
18 03247 024117          LDA     1,UFLAG
19 03250 125005          MOV     1,1,SNR             ;PSI/U?
20 03251 072034          DOB     2,MUX               ;YES, LOAD TRANSMIT WORD
21                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
22 03252 006155          JSR@    ITRMT
23 03253 100031 100000+LOOPBACK+NOPARITY+CODE8
24                       XCLK    C1
25 03254 020235          LDA     0,C1
26 03255 006123          JSR     @.STEP
27                       MUXCLKA C1
28 03256 020235          LDA     0,C1
29 03257 006121          JSR     @ICONT
30                       XCLK    C1
31 03260 020235          LDA     0,C1
32 03261 006123          JSR     @.STEP
33                       MUXCLKA C5
34 03262 020241          LDA     0,C5
35 03263 006121          JSR     @ICONT
36                       XCLK    C10.
37 03264 020246          LDA     0,C10.
38 03265 006123          JSR     @.STEP
39                       CHECK   SZR
40 03266 060434          DIA     0,MUX
41 03267 062434          DIC     0,MUX
42 03270 024072          LDA     1,XMSK
43 03271 123414          AND#    1,0,SZR
44                       EHALT                       ;XMIT BIT 6 INCORRECT FROM
45 03272 006230          JSR@    IERR?
46 03273 006231          LOOPX                       ;SHIFT REGISTER-
47                                                   ;DATA BIT 6 IN STORAGE
48               TR19:   UBITCHECK       7,C12.,SNR
49 03274 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 7
50 03275 000005          5
51 03276 062677          IORST
52 03277 030302          LDA     2,C125              ;TRANSMIT WORD (PSI/U)
53 03300 024117          LDA     1,UFLAG
54 03301 125005          MOV     1,1,SNR             ;PSI/U?
55 03302 072034          DOB     2,MUX               ;YES, LOAD TRANSMIT WORD
56                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
57 03303 006155          JSR@    ITRMT
58 03304 100031 100000+LOOPBACK+NOPARITY+CODE8
59                       XCLK    C1
60 03305 020235          LDA     0,C1
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 0049  PSID
01 03306 006123          JSR     @.STEP
02                       MUXCLKA C1
03 03307 020235          LDA     0,C1
04 03310 006121          JSR     @ICONT
05                       XCLK    C1
06 03311 020235          LDA     0,C1
07 03312 006123          JSR     @.STEP
08                       MUXCLKA C5
09 03313 020241          LDA     0,C5
10 03314 006121          JSR     @ICONT
11                       XCLK    C12.
12 03315 020250          LDA     0,C12.
13 03316 006123          JSR     @.STEP
14                       CHECK   SNR
15 03317 060434          DIA     0,MUX
16 03320 062434          DIC     0,MUX
17 03321 024072          LDA     1,XMSK
18 03322 123415          AND#    1,0,SNR
19                       EHALT                       ;XMIT BIT 7 INCORRECT FROM
20 03323 006230          JSR@    IERR?
21 03324 006231          LOOPX                       ;SHIFT REGISTER-
22                                                   ;DATA BIT 7 IN STORAGE
23
24               TR20:   UBITCHECK       8.,C14.,SZR
25 03325 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 8.
26 03326 000005          5
27 03327 062677          IORST
28 03330 030302          LDA     2,C125              ;TRANSMIT WORD (PSI/U)
29 03331 024117          LDA     1,UFLAG
30 03332 125005          MOV     1,1,SNR             ;PSI/U?
31 03333 072034          DOB     2,MUX               ;YES, LOAD TRANSMIT WORD
32                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
33 03334 006155          JSR@    ITRMT
34 03335 100031 100000+LOOPBACK+NOPARITY+CODE8
35                       XCLK    C1
36 03336 020235          LDA     0,C1
37 03337 006123          JSR     @.STEP
38                       MUXCLKA C1
39 03340 020235          LDA     0,C1
40 03341 006121          JSR     @ICONT
41                       XCLK    C1
42 03342 020235          LDA     0,C1
43 03343 006123          JSR     @.STEP
44                       MUXCLKA C5
45 03344 020241          LDA     0,C5
46 03345 006121          JSR     @ICONT
47                       XCLK    C14.
48 03346 020252          LDA     0,C14.
49 03347 006123          JSR     @.STEP
50                       CHECK   SZR
51 03350 060434          DIA     0,MUX
52 03351 062434          DIC     0,MUX
53 03352 024072          LDA     1,XMSK
54 03353 123414          AND#    1,0,SZR
55                       EHALT                       ;XMIT BIT 8. INCORRECT FROM
56 03354 006230          JSR@    IERR?
57 03355 006231          LOOPX                       ;SHIFT REGISTER-
58                                                   ;DATA BIT 8. IN STORAGE
59 03356 006226 TR21:    JSR@    IENT?               ;XMIT CHARACTER (NOT SYN)
60 03357 000005          5
```

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 0050  PSID
01 03360 062677          IORST
02 03361 020102          LDA     0,TRADR          ;CHANGE DLE CHAR.
03 03362 061034          DOA     0,MUX
04 03363 024335          LDA     1,C40125                 ;SYNC WORD
05 03364 067034          DOC     1,MUX
06 03365 024344          LDA     1,C140125
07 03366 067034          DOC     1,MUX
08                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
09 03367 006155          JSR@    ITRMT
10 03370 100031 100000+LOOPBACK+NOPARITY+CODE8
11                       XCLK    C1
12 03371 020235          LDA     0,C1
13 03372 006123          JSR     @.STEP
14                       MUXCLKA C1
15 03373 020235          LDA     0,C1
16 03374 006121          JSR     @ICONT
17 03375 024314          LDA     1,C252
18 03376 066034          DOB     1,MUX
19                       XCLK    C1
20 03377 020235          LDA     0,C1
21 03400 006123          JSR     @.STEP
22                       MUXCLKA C5
23 03401 020241          LDA     0,C5
24 03402 006121          JSR     @ICONT
25                       CHECK   SZR
26 03403 060434          DIA     0,MUX
27 03404 062434          DIC     0,MUX
28 03405 024072          LDA     1,XMSK
29 03406 123414          AND#    1,0,SZR
30                       EHALT                    ;ROM, XRDY, XMIT SHIFT
31 03407 006230          JSR@    IERR?
32 03410 006231          LOOPX                    ;REGISTER, DATA BIT 1 IN STORAGE,
33                                                ; DOB, XMIT0, XFILE
34
35               TR22:   TRSCH   2,C2,SNR,C252
36 03411 006226          JSR@    IENT?            ;XMIT SHIFT TO BIT 2
37 03412 000005          5
38 03413 062677          IORST
39                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
40 03414 006155          JSR@    ITRMT
41 03415 100031 100000+LOOPBACK+NOPARITY+CODE8
42                       XCLK    C1
43 03416 020235          LDA     0,C1
44 03417 006123          JSR     @.STEP
45                       MUXCLKA C1
46 03420 020235          LDA     0,C1
47 03421 006121          JSR     @ICONT
48 03422 024314          LDA     1,C252
49 03423 066034          DOB     1,MUX
50                       XCLK    C1
51 03424 020235          LDA     0,C1
52 03425 006123          JSR     @.STEP
53                       MUXCLKA C5
54 03426 020241          LDA     0,C5
55 03427 006121          JSR     @ICONT
56                       XCLK    C2
57 03430 020236          LDA     0,C2
58 03431 006123          JSR     @.STEP
59                       CHECK   SNR
60 03432 060434          DIA     0,MUX
```

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 0051  PSID
01 03433 062434          DIC     0,MUX
02 03434 024072          LDA     1,XMSK
03 03435 123415          AND#    1,0,SNR
04                       EHALT                   ;XMIT BIT  2 INCORRECT
05 03436 006230          JSR@    IERR?
06 03437 006231          LOOPX                   ;FROM DATA BIT 2 IN
07                                               ;STORAGE
08               TR23:   TRSCH   3,C4,SZR,C252
09 03440 006226          JSR@    IENT?           ;XMIT SHIFT TO BIT 3
10 03441 000005          5
11 03442 062677          IORST
12                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
13 03443 006155          JSR@    ITRMT
14 03444 100031 100000+LOOPBACK+NOPARITY+CODE8
15                       XCLK    C1
16 03445 020235          LDA     0,C1
17 03446 006123          JSR     @.STEP
18                       MUXCLKA C1
19 03447 020235          LDA     0,C1
20 03450 006121          JSR     @ICONT
21 03451 024314          LDA     1,C252
22 03452 066034          DOB     1,MUX
23                       XCLK    C1
24 03453 020235          LDA     0,C1
25 03454 006123          JSR     @.STEP
26                       MUXCLKA C5
27 03455 020241          LDA     0,C5
28 03456 006121          JSR     @ICONT
29                       XCLK    C4
30 03457 020240          LDA     0,C4
31 03460 006123          JSR     @.STEP
32                       CHECK   SZR
33 03461 060434          DIA     0,MUX
34 03462 062434          DIC     0,MUX
35 03463 024072          LDA     1,XMSK
36 03464 123414          AND#    1,0,SZR
37                       EHALT                   ;XMIT BIT  3 INCORRECT
38 03465 006230          JSR@    IERR?
39 03466 006231          LOOPX                   ;FROM DATA BIT 3 IN
40                                               ;STORAGE
41
42               TR24:   TRSCH   4,C6,SNR,C252
43 03467 006226          JSR@    IENT?           ;XMIT SHIFT TO BIT 4
44 03470 000005          5
45 03471 062677          IORST
46                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
47 03472 006155          JSR@    ITRMT
48 03473 100031 100000+LOOPBACK+NOPARITY+CODE8
49                       XCLK    C1
50 03474 020235          LDA     0,C1
51 03475 006123          JSR     @.STEP
52                       MUXCLKA C1
53 03476 020235          LDA     0,C1
54 03477 006121          JSR     @ICONT
55 03500 024314          LDA     1,C252
56 03501 066034          DOB     1,MUX
57                       XCLK    C1
58 03502 020235          LDA     0,C1
59 03503 006123          JSR     @.STEP
60                       MUXCLKA C5
```

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 0052  PSID
01 03504 020241          LDA     0,C5
02 03505 006121          JSR     @ICONT
03                       XCLK    C6
04 03506 020242          LDA     0,C6
05 03507 006123          JSR     @.STEP
06                       CHECK   SNR
07 03510 060434          DIA     0,MUX
08 03511 062434          DIC     0,MUX
09 03512 024072          LDA     1,XMSK
10 03513 123415          AND#    1,0,SNR
11                       EHALT                       ;XMIT BIT  4 INCORRECT
12 03514 006230          JSR@    IERR?
13 03515 006231          LOOPX                       ;FROM DATA BIT 4 IN
14                                                   ;STORAGE
15               TR25:   TRSCH   5,C8.,SZR,C252
16 03516 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 5
17 03517 000005          5
18 03520 062677          IORST
19                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
20 03521 006155          JSR@    ITRMT
21 03522 100031 100000+LOOPBACK+NOPARITY+CODE8
22                       XCLK    C1
23 03523 020235          LDA     0,C1
24 03524 006123          JSR     @.STEP
25                       MUXCLKA C1
26 03525 020235          LDA     0,C1
27 03526 006121          JSR     @ICONT
28 03527 024314          LDA     1,C252
29 03530 066034          DOB     1,MUX
30                       XCLK    C1
31 03531 020235          LDA     0,C1
32 03532 006123          JSR     @.STEP
33                       MUXCLKA C5
34 03533 020241          LDA     0,C5
35 03534 006121          JSR     @ICONT
36                       XCLK    C8.
37 03535 020244          LDA     0,C8.
38 03536 006123          JSR     @.STEP
39                       CHECK   SZR
40 03537 060434          DIA     0,MUX
41 03540 062434          DIC     0,MUX
42 03541 024072          LDA     1,XMSK
43 03542 123414          AND#    1,0,SZR
44                       EHALT                       ;XMIT BIT  5 INCORRECT
45 03543 006230          JSR@    IERR?
46 03544 006231          LOOPX                       ;FROM DATA BIT 5 IN
47                                                   ;STORAGE
48
49               TR26:   TRSCH   6,C10.,SNR,C252
50 03545 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 6
51 03546 000005          5
52 03547 062677          IORST
53                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
54 03550 006155          JSR@    ITRMT
55 03551 100031 100000+LOOPBACK+NOPARITY+CODE8
56                       XCLK    C1
57 03552 020235          LDA     0,C1
58 03553 006123          JSR     @.STEP
59                       MUXCLKA C1
60 03554 020235          LDA     0,C1
```

```
 0053  PSID
01 03555 006121          JSR     @ICONT
02 03556 024314          LDA     1,C252
03 03557 066034          DOB     1,MUX
04                       XCLK    C1
05 03560 020235          LDA     0,C1
06 03561 006123          JSR     @.STEP
07                       MUXCLKA C5
08 03562 020241          LDA     0,C5
09 03563 006121          JSR     @ICONT
10                       XCLK    C10.
11 03564 020246          LDA     0,C10.
12 03565 006123          JSR     @.STEP
13                       CHECK   SNR
14 03566 060434          DIA     0,MUX
15 03567 062434          DIC     0,MUX
16 03570 024072          LDA     1,XMSK
17 03571 123415          AND#    1,0,SNR
18                       EHALT                       ;XMIT BIT  6 INCORRECT
19 03572 006230          JSR@    IERR?
20 03573 006231          LOOPX                       ;FROM DATA BIT 6 IN
21                                                   ;STORAGE
22               TR27:   TRSCH   7,C12.,SZR,C252
23 03574 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 7
24 03575 000005          5
25 03576 062677          IORST
26                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
27 03577 006155          JSR@    ITRMT
28 03600 100031 100000+LOOPBACK+NOPARITY+CODE8
29                       XCLK    C1
30 03601 020235          LDA     0,C1
31 03602 006123          JSR     @.STEP
32                       MUXCLKA C1
33 03603 020235          LDA     0,C1
34 03604 006121          JSR     @ICONT
35 03605 024314          LDA     1,C252
36 03606 066034          DOB     1,MUX
37                       XCLK    C1
38 03607 020235          LDA     0,C1
39 03610 006123          JSR     @.STEP
40                       MUXCLKA C5
41 03611 020241          LDA     0,C5
42 03612 006121          JSR     @ICONT
43                       XCLK    C12.
44 03613 020250          LDA     0,C12.
45 03614 006123          JSR     @.STEP
46                       CHECK   SZR
47 03615 060434          DIA     0,MUX
48 03616 062434          DIC     0,MUX
49 03617 024072          LDA     1,XMSK
50 03620 123414          AND#    1,0,SZR
51                       EHALT                       ;XMIT BIT  7 INCORRECT
52 03621 006230          JSR@    IERR?
53 03622 006231          LOOPX                       ;FROM DATA BIT 7 IN
54                                                   ;STORAGE
55
56               TR28:   TRSCH   8.,C14.,SNR,C252
57 03623 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 8.
58 03624 000005          5
59 03625 062677          IORST
60                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
```

```
 0054  PSID
01 03626 006155          JSR@    ITRMT
02 03627 100031 100000+LOOPBACK+NOPARITY+CODE8
03                       XCLK    C1
04 03630 020235          LDA     0,C1
05 03631 006123          JSR     @.STEP
06                       MUXCLKA C1
07 03632 020235          LDA     0,C1
08 03633 006121          JSR     @ICONT
09 03634 024314          LDA     1,C252
10 03635 066034          DOB     1,MUX
11                       XCLK    C1
12 03636 020235          LDA     0,C1
13 03637 006123          JSR     @.STEP
14                       MUXCLKA C5
15 03640 020241          LDA     0,C5
16 03641 006121          JSR     @ICONT
17                       XCLK    C14.
18 03642 020252          LDA     0,C14.
19 03643 006123          JSR     @.STEP
20                       CHECK   SNR
21 03644 060434          DIA     0,MUX
22 03645 062434          DIC     0,MUX
23 03646 024072          LDA     1,XMSK
24 03647 123415          AND#    1,0,SNR
25                       EHALT                   ;XMIT BIT  8. INCORRECT
26 03650 006230          JSR@    IERR?
27 03651 006231          LOOPX                   ;FROM DATA BIT 8. IN
28                                               ;STORAGE
29 03652 006226 TR29:    JSR@    IENT?           ;CHANGE XMIT WORD AND REPEAT
30 03653 000005          5
31 03654 062677          IORST
32 03655 020102          LDA     0,TRADR
33 03656 061034          DOA     0,MUX
34 03657 024345          LDA     1,C140252       ;DLE WORD
35 03660 067034          DOC     1,MUX
36 03661 024337          LDA     1,C40252
37 03662 067034          DOC     1,MUX
38                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
39 03663 006155          JSR@    ITRMT
40 03664 100031 100000+LOOPBACK+NOPARITY+CODE8
41                       XCLK    C1
42 03665 020235          LDA     0,C1
43 03666 006123          JSR     @.STEP
44                       MUXCLKA C1
45 03667 020235          LDA     0,C1
46 03670 006121          JSR     @ICONT
47 03671 024302          LDA     1,C125
48 03672 066034          DOB     1,MUX
49                       XCLK    C1
50 03673 020235          LDA     0,C1
51 03674 006123          JSR     @.STEP
52                       MUXCLKA C5
53 03675 020241          LDA     0,C5
54 03676 006121          JSR     @ICONT
55                       CHECK   SNR
56 03677 060434          DIA     0,MUX
57 03700 062434          DIC     0,MUX
58 03701 024072          LDA     1,XMSK
59 03702 123415          AND#    1,0,SNR
60                       EHALT                   ;XMIT BIT 1 FROM SHIFT
```

```
 0055  PSID
01 03703 006230          JSR@    IERR?
02 03704 006231          LOOPX                       ;REGISTER
03
04               TR30:   TRSCH   2,C2,SZR,C125
05 03705 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 2
06 03706 000005          5
07 03707 062677          IORST
08                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
09 03710 006155          JSR@    ITRMT
10 03711 100031 100000+LOOPBACK+NOPARITY+CODE8
11                       XCLK    C1
12 03712 020235          LDA     0,C1
13 03713 006123          JSR     @.STEP
14                       MUXCLKA C1
15 03714 020235          LDA     0,C1
16 03715 006121          JSR     @ICONT
17 03716 024302          LDA     1,C125
18 03717 066034          DOB     1,MUX
19                       XCLK    C1
20 03720 020235          LDA     0,C1
21 03721 006123          JSR     @.STEP
22                       MUXCLKA C5
23 03722 020241          LDA     0,C5
24 03723 006121          JSR     @ICONT
25                       XCLK    C2
26 03724 020236          LDA     0,C2
27 03725 006123          JSR     @.STEP
28                       CHECK   SZR
29 03726 060434          DIA     0,MUX
30 03727 062434          DIC     0,MUX
31 03730 024072          LDA     1,XMSK
32 03731 123414          AND#    1,0,SZR
33                       EHALT                       ;XMIT BIT  2 INCORRECT
34 03732 006230          JSR@    IERR?
35 03733 006231          LOOPX                       ;FROM DATA BIT 2 IN
36                                                   ;STORAGE
37               TR31:   TRSCH   3,C4,SNR,C125
38 03734 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 3
39 03735 000005          5
40 03736 062677          IORST
41                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
42 03737 006155          JSR@    ITRMT
43 03740 100031 100000+LOOPBACK+NOPARITY+CODE8
44                       XCLK    C1
45 03741 020235          LDA     0,C1
46 03742 006123          JSR     @.STEP
47                       MUXCLKA C1
48 03743 020235          LDA     0,C1
49 03744 006121          JSR     @ICONT
50 03745 024302          LDA     1,C125
51 03746 066034          DOB     1,MUX
52                       XCLK    C1
53 03747 020235          LDA     0,C1
54 03750 006123          JSR     @.STEP
55                       MUXCLKA C5
56 03751 020241          LDA     0,C5
57 03752 006121          JSR     @ICONT
58                       XCLK    C4
59 03753 020240          LDA     0,C4
60 03754 006123          JSR     @.STEP
```

```
 0056  PSID
01                          CHECK   SNR
02 03755 060434             DIA     0,MUX
03 03756 062434             DIC     0,MUX
04 03757 024072             LDA     1,XMSK
05 03760 123415             AND#    1,0,SNR
06                          EHALT                       ;XMIT BIT  3 INCORRECT
07 03761 006230             JSR@    IERR?
08 03762 006231             LOOPX                       ;FROM DATA BIT 3 IN
09                                                      ;STORAGE
10
11                  TR32:   TRSCH   4,C6,SZR,C125
12 03763 006226             JSR@    IENT?               ;XMIT SHIFT TO BIT 4
13 03764 000005             5
14 03765 062677             IORST
15                          TRANSMIT        LOOPBACK,NOPARITY,CODE8
16 03766 006155             JSR@    ITRMT
17 03767 100031 100000+LOOPBACK+NOPARITY+CODE8
18                          XCLK    C1
19 03770 020235             LDA     0,C1
20 03771 006123             JSR     @.STEP
21                          MUXCLKA C1
22 03772 020235             LDA     0,C1
23 03773 006121             JSR     @ICONT
24 03774 024302             LDA     1,C125
25 03775 066034             DOB     1,MUX
26                          XCLK    C1
27 03776 020235             LDA     0,C1
28 03777 006123             JSR     @.STEP
29                          MUXCLKA C5
30 04000 020241             LDA     0,C5
31 04001 006121             JSR     @ICONT
32                          XCLK    C6
33 04002 020242             LDA     0,C6
34 04003 006123             JSR     @.STEP
35                          CHECK   SZR
36 04004 060434             DIA     0,MUX
37 04005 062434             DIC     0,MUX
38 04006 024072             LDA     1,XMSK
39 04007 123414             AND#    1,0,SZR
40                          EHALT                       ;XMIT BIT  4 INCORRECT
41 04010 006230             JSR@    IERR?
42 04011 006231             LOOPX                       ;FROM DATA BIT 4 IN
43                                                      ;STORAGE
44                  TR33:   TRSCH   5,C8.,SNR,C125
45 04012 006226             JSR@    IENT?               ;XMIT SHIFT TO BIT 5
46 04013 000005             5
47 04014 062677             IORST
48                          TRANSMIT        LOOPBACK,NOPARITY,CODE8
49 04015 006155             JSR@    ITRMT
50 04016 100031 100000+LOOPBACK+NOPARITY+CODE8
51                          XCLK    C1
52 04017 020235             LDA     0,C1
53 04020 006123             JSR     @.STEP
54                          MUXCLKA C1
55 04021 020235             LDA     0,C1
56 04022 006121             JSR     @ICONT
57 04023 024302             LDA     1,C125
58 04024 066034             DOB     1,MUX
59                          XCLK    C1
60 04025 020235             LDA     0,C1
```

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 0057  PSID
01 04026 006123          JSR     @.STEP
02                       MUXCLKA C5
03 04027 020241          LDA     0,C5
04 04030 006121          JSR     @ICONT
05                       XCLK    C8.
06 04031 020244          LDA     0,C8.
07 04032 006123          JSR     @.STEP
08                       CHECK   SNR
09 04033 060434          DIA     0,MUX
10 04034 062434          DIC     0,MUX
11 04035 024072          LDA     1,XMSK
12 04036 123415          AND#    1,0,SNR
13                       EHALT                       ;XMIT BIT  5 INCORRECT
14 04037 006230          JSR@    IERR?
15 04040 006231          LOOPX                       ;FROM DATA BIT 5 IN
16                                                   ;STORAGE
17               TR34:   TRSCH   6,C10.,SZR,C125
18 04041 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 6
19 04042 000005          5
20 04043 062677          IORST
21                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
22 04044 006155          JSR@    ITRMT
23 04045 100031 100000+LOOPBACK+NOPARITY+CODE8
24                       XCLK    C1
25 04046 020235          LDA     0,C1
26 04047 006123          JSR     @.STEP
27                       MUXCLKA C1
28 04050 020235          LDA     0,C1
29 04051 006121          JSR     @ICONT
30 04052 024302          LDA     1,C125
31 04053 066034          DOB     1,MUX
32                       XCLK    C1
33 04054 020235          LDA     0,C1
34 04055 006123          JSR     @.STEP
35                       MUXCLKA C5
36 04056 020241          LDA     0,C5
37 04057 006121          JSR     @ICONT
38                       XCLK    C10.
39 04060 020246          LDA     0,C10.
40 04061 006123          JSR     @.STEP
41                       CHECK   SZR
42 04062 060434          DIA     0,MUX
43 04063 062434          DIC     0,MUX
44 04064 024072          LDA     1,XMSK
45 04065 123414          AND#    1,0,SZR
46                       EHALT                       ;XMIT BIT  6 INCORRECT
47 04066 006230          JSR@    IERR?
48 04067 006231          LOOPX                       ;FROM DATA BIT 6 IN
49                                                   ;STORAGE
50               TR35:   TRSCH   7,C12.,SNR,C125
51 04070 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 7
52 04071 000005          5
53 04072 062677          IORST
54                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
55 04073 006155          JSR@    ITRMT
56 04074 100031 100000+LOOPBACK+NOPARITY+CODE8
57                       XCLK    C1
58 04075 020235          LDA     0,C1
59 04076 006123          JSR     @.STEP
60                       MUXCLKA C1
```

```
 0058  PSID
01 04077 020235          LDA     0,C1
02 04100 006121          JSR     @ICONT
03 04101 024302          LDA     1,C125
04 04102 066034          DOB     1,MUX
05                       XCLK    C1
06 04103 020235          LDA     0,C1
07 04104 006123          JSR     @.STEP
08                       MUXCLKA C5
09 04105 020241          LDA     0,C5
10 04106 006121          JSR     @ICONT
11                       XCLK    C12.
12 04107 020250          LDA     0,C12.
13 04110 006123          JSR     @.STEP
14                       CHECK   SNR
15 04111 060434          DIA     0,MUX
16 04112 062434          DIC     0,MUX
17 04113 024072          LDA     1,XMSK
18 04114 123415          AND#    1,0,SNR
19                       EHALT                   ;XMIT BIT  7 INCORRECT
20 04115 006230          JSR@    IERR?
21 04116 006231          LOOPX                   ;FROM DATA BIT 7 IN
22                                               ;STORAGE
23               TR36:   TRSCH   8.,C14.,SZR,C125
24 04117 006226          JSR@    IENT?           ;XMIT SHIFT TO BIT 8.
25 04120 000005          5
26 04121 062677          IORST
27                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
28 04122 006155          JSR@    ITRMT
29 04123 100031 100000+LOOPBACK+NOPARITY+CODE8
30                       XCLK    C1
31 04124 020235          LDA     0,C1
32 04125 006123          JSR     @.STEP
33                       MUXCLKA C1
34 04126 020235          LDA     0,C1
35 04127 006121          JSR     @ICONT
36 04130 024302          LDA     1,C125
37 04131 066034          DOB     1,MUX
38                       XCLK    C1
39 04132 020235          LDA     0,C1
40 04133 006123          JSR     @.STEP
41                       MUXCLKA C5
42 04134 020241          LDA     0,C5
43 04135 006121          JSR     @ICONT
44                       XCLK    C14.
45 04136 020252          LDA     0,C14.
46 04137 006123          JSR     @.STEP
47                       CHECK   SZR
48 04140 060434          DIA     0,MUX
49 04141 062434          DIC     0,MUX
50 04142 024072          LDA     1,XMSK
51 04143 123414          AND#    1,0,SZR
52                       EHALT                   ;XMIT BIT  8. INCORRECT
53 04144 006230          JSR@    IERR?
54 04145 006231          LOOPX                   ;FROM DATA BIT 8. IN
55                                               ;STORAGE
56 04146 006226 TR37:    JSR@    IENT?           ;XMIT CHAR. FOLLOWED BY
57 04147 000005          5
58 04150 062677          IORST
59                                               ;SYN WORD UNDERRUN
60                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
```

```
 0059  PSID
01 04151 006155          JSR@     ITRMT
02 04152 100031 100000+LOOPBACK+NOPARITY+CODE8
03                       XCLK     C1
04 04153 020235          LDA      0,C1
05 04154 006123          JSR      @.STEP
06                       MUXCLKA  C1
07 04155 020235          LDA      0,C1
08 04156 006121          JSR      @ICONT
09 04157 024302          LDA      1,C125
10 04160 066034          DOB      1,MUX
11                       XCLK     C1
12 04161 020235          LDA      0,C1
13 04162 006123          JSR      @.STEP
14                       MUXCLKA  C5
15 04163 020241          LDA      0,C5
16 04164 006121          JSR      @ICONT
17                       XCLK     C13.
18 04165 020251          LDA      0,C13.
19 04166 006123          JSR      @.STEP
20                       MUXCLKA  C1
21 04167 020235          LDA      0,C1
22 04170 006121          JSR      @ICONT
23                       XCLK     C3
24 04171 020237          LDA      0,C3
25 04172 006123          JSR      @.STEP
26                       MUXCLKA  C5
27 04173 020241          LDA      0,C5
28 04174 006121          JSR      @ICONT
29                       CHECK    SZR
30 04175 060434          DIA      0,MUX
31 04176 062434          DIC      0,MUX
32 04177 024072          LDA      1,XMSK
33 04200 123414          AND#     1,0,SZR
34                       EHALT                        ;XRDY, ROM, SHIFT REGISTER
35 04201 006230          JSR@     IERR?
36 04202 006231          LOOPX
37
38 04203 006226 TR38:    JSR@     IENT?               ;SECOND BIT OF SYNC WORD
39 04204 000005          5
40 04205 062677          IORST
41                       TRANSMIT         LOOPBACK,NOPARITY,CODE8
42 04206 006155          JSR@     ITRMT
43 04207 100031 100000+LOOPBACK+NOPARITY+CODE8
44                       XCLK     C1
45 04210 020235          LDA      0,C1
46 04211 006123          JSR      @.STEP
47                       MUXCLKA  C1
48 04212 020235          LDA      0,C1
49 04213 006121          JSR      @ICONT
50 04214 024314          LDA      1,C252
51 04215 066034          DOB      1,MUX
52                       XCLK     C1
53 04216 020235          LDA      0,C1
54 04217 006123          JSR      @.STEP
55                       MUXCLKA  C5
56 04220 020241          LDA      0,C5
57 04221 006121          JSR      @ICONT
58                       XCLK     C13.
59 04222 020251          LDA      0,C13.
60 04223 006123          JSR      @.STEP
```

```
 0060  PSID
01                      MUXCLKA C1
02 04224 020235         LDA     0,C1
03 04225 006121         JSR     @ICONT
04                      XCLK    C3
05 04226 020237         LDA     0,C3
06 04227 006123         JSR     @.STEP
07                      MUXCLKA C5
08 04230 020241         LDA     0,C5
09 04231 006121         JSR     @ICONT
10                      XCLK    C2
11 04232 020236         LDA     0,C2
12 04233 006123         JSR     @.STEP
13                      CHECK   SNR
14 04234 060434         DIA     0,MUX
15 04235 062434         DIC     0,MUX
16 04236 024072         LDA     1,XMSK
17 04237 123415         AND#    1,0,SNR
18                      EHALT                   ;SHIFT REGISTER, XRDY
19 04240 006230         JSR@    IERR?
20 04241 006231         LOOPX
21 04242 006226 TR39:   JSR@    IENT?           ;TWO XMIT CHARS. IN A ROW
22 04243 000005         5
23 04244 062677         IORST
24                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
25 04245 006155         JSR@    ITRMT
26 04246 100031 100000+LOOPBACK+NOPARITY+CODE8
27                      XCLK    C1
28 04247 020235         LDA     0,C1
29 04250 006123         JSR     @.STEP
30                      MUXCLKA C1
31 04251 020235         LDA     0,C1
32 04252 006121         JSR     @ICONT
33 04253 024302         LDA     1,C125
34 04254 066034         DOB     1,MUX
35                      XCLK    C1
36 04255 020235         LDA     0,C1
37 04256 006123         JSR     @.STEP
38                      MUXCLKA C5
39 04257 020241         LDA     0,C5
40 04260 006121         JSR     @ICONT
41                      XCLK    C13.
42 04261 020251         LDA     0,C13.
43 04262 006123         JSR     @.STEP
44 04263 024302         LDA     1,C125          ;TRANSMIT SECOND CHARACTER
45 04264 066034         DOB     1,MUX
46                      MUXCLKA C1
47 04265 020235         LDA     0,C1
48 04266 006121         JSR     @ICONT
49                      XCLK    C3
50 04267 020237         LDA     0,C3
51 04270 006123         JSR     @.STEP
52                      MUXCLKA C5
53 04271 020241         LDA     0,C5
54 04272 006121         JSR     @ICONT
55                      CHECK   SNR
56 04273 060434         DIA     0,MUX
57 04274 062434         DIC     0,MUX
58 04275 024072         LDA     1,XMSK
59 04276 123415         AND#    1,0,SNR
60                      EHALT                   ;ROM, XRDY, XMIT SHIFTER
```

```
 0061  PSID
01 04277 006230          JSR@    IERR?
02 04300 006231          LOOPX
03
04 04301 006226 TR40:    JSR@    IENT?           ;INSURE UNDERRUN CHAR.
05 04302 000005          5
06 04303 062677          IORST
07 04304 020102          LDA     0,TRADR         ;IS NOT DLE
08 04305 061034          DOA     0,MUX
09 04306 024344          LDA     1,C140125       ;CHANGE DLE
10 04307 067034          DOC     1,MUX
11                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
12 04310 006155          JSR@    ITRMT
13 04311 100031 100000+LOOPBACK+NOPARITY+CODE8
14                       XCLK    C1
15 04312 020235          LDA     0,C1
16 04313 006123          JSR     @.STEP
17                       MUXCLKA C1
18 04314 020235          LDA     0,C1
19 04315 006121          JSR     @ICONT
20 04316 024302          LDA     1,C125
21 04317 066034          DOB     1,MUX
22                       XCLK    C1
23 04320 020235          LDA     0,C1
24 04321 006123          JSR     @.STEP
25                       MUXCLKA C5
26 04322 020241          LDA     0,C5
27 04323 006121          JSR     @ICONT
28                       XCLK    C13.
29 04324 020251          LDA     0,C13.
30 04325 006123          JSR     @.STEP
31                       MUXCLKA C1
32 04326 020235          LDA     0,C1
33 04327 006121          JSR     @ICONT
34                       XCLK    C3
35 04330 020237          LDA     0,C3
36 04331 006123          JSR     @.STEP
37                       MUXCLKA C5
38 04332 020241          LDA     0,C5
39 04333 006121          JSR     @ICONT
40                       CHECK   SZR
41 04334 060434          DIA     0,MUX
42 04335 062434          DIC     0,MUX
43 04336 024072          LDA     1,XMSK
44 04337 123414          AND#    1,0,SZR
45                       EHALT                   ;XMIT SHIFTER, DATA STORAGE
46 04340 006230          JSR@    IERR?
47 04341 006231          LOOPX
48 04342 006226 TR41:    JSR@    IENT?           ;INSERT DLE- ENTER TRANSPARENT
49 04343 000005          5
50 04344 062677          IORST
51                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
52 04345 006155          JSR@    ITRMT
53 04346 100031 100000+LOOPBACK+NOPARITY+CODE8
54                       XCLK    C1
55 04347 020235          LDA     0,C1
56 04350 006123          JSR     @.STEP
57                       MUXCLKA C1
58 04351 020235          LDA     0,C1
59 04352 006121          JSR     @ICONT
60 04353 024333          LDA     1,C30252
```

```
 0062  PSID
01 04354 066034          DOB     1,MUX
02                       XCLK    C1
03 04355 020235          LDA     0,C1
04 04356 006123          JSR     @.STEP
05                       MUXCLKA C5
06 04357 020241          LDA     0,C5
07 04360 006121          JSR     @ICONT
08                       CHECK   SNR
09 04361 060434          DIA     0,MUX
10 04362 062434          DIC     0,MUX
11 04363 024072          LDA     1,XMSK
12 04364 123415          AND#    1,0,SNR
13                       EHALT                       ;XPARENT, CHANGE,
14 04365 006230          JSR@    IERR?
15 04366 006231          LOOPX                       ;DATA STORAGE, ROM
16
17                TR42:  TRSCH   2,C2,SZR,C3025
18 04367 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 2
19 04370 000005          5
20 04371 062677          IORST
21                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
22 04372 006155          JSR@    ITRMT
23 04373 100031 100000+LOOPBACK+NOPARITY+CODE8
24                       XCLK    C1
25 04374 020235          LDA     0,C1
26 04375 006123          JSR     @.STEP
27                       MUXCLKA C1
28 04376 020235          LDA     0,C1
29 04377 006121          JSR     @ICONT
30 04400 024333          LDA     1,C3025
31 04401 066034          DOB     1,MUX
32                       XCLK    C1
33 04402 020235          LDA     0,C1
34 04403 006123          JSR     @.STEP
35                       MUXCLKA C5
36 04404 020241          LDA     0,C5
37 04405 006121          JSR     @ICONT
38                       XCLK    C2
39 04406 020236          LDA     0,C2
40 04407 006123          JSR     @.STEP
41                       CHECK   SZR
42 04410 060434          DIA     0,MUX
43 04411 062434          DIC     0,MUX
44 04412 024072          LDA     1,XMSK
45 04413 123414          AND#    1,0,SZR
46                       EHALT                       ;XMIT BIT  2 INCORRECT
47 04414 006230          JSR@    IERR?
48 04415 006231          LOOPX                       ;FROM DATA BIT 2 IN
49                                                   ;STORAGE
50                TR43:  TRSCH   3,C4,SNR,C3025
51 04416 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 3
52 04417 000005          5
53 04420 062677          IORST
54                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
55 04421 006155          JSR@    ITRMT
56 04422 100031 100000+LOOPBACK+NOPARITY+CODE8
57                       XCLK    C1
58 04423 020235          LDA     0,C1
59 04424 006123          JSR     @.STEP
60                       MUXCLKA C1
```

```
 0063  PSID
01 04425 020235          LDA     0,C1
02 04426 006121          JSR     @ICONT
03 04427 024333          LDA     1,C3025
04 04430 066034          DOB     1,MUX
05                       XCLK    C1
06 04431 020235          LDA     0,C1
07 04432 006123          JSR     @.STEP
08                       MUXCLKA C5
09 04433 020241          LDA     0,C5
10 04434 006121          JSR     @ICONT
11                       XCLK    C4
12 04435 020240          LDA     0,C4
13 04436 006123          JSR     @.STEP
14                       CHECK   SNR
15 04437 060434          DIA     0,MUX
16 04440 062434          DIC     0,MUX
17 04441 024072          LDA     1,XMSK
18 04442 123415          AND#    1,0,SNR
19                       EHALT                       ;XMIT BIT  3 INCORRECT
20 04443 006230          JSR@    IERR?
21 04444 006231          LOOPX                       ;FROM DATA BIT 3 IN
22                                                   ;STORAGE
23
24               TR44:   TRSCH   4,C6,SZR,C3025
25 04445 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 4
26 04446 000005          5
27 04447 062677          IORST
28                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
29 04450 006155          JSR@    ITRMT
30 04451 100031 100000+LOOPBACK+NOPARITY+CODE8
31                       XCLK    C1
32 04452 020235          LDA     0,C1
33 04453 006123          JSR     @.STEP
34                       MUXCLKA C1
35 04454 020235          LDA     0,C1
36 04455 006121          JSR     @ICONT
37 04456 024333          LDA     1,C3025
38 04457 066034          DOB     1,MUX
39                       XCLK    C1
40 04460 020235          LDA     0,C1
41 04461 006123          JSR     @.STEP
42                       MUXCLKA C5
43 04462 020241          LDA     0,C5
44 04463 006121          JSR     @ICONT
45                       XCLK    C6
46 04464 020242          LDA     0,C6
47 04465 006123          JSR     @.STEP
48                       CHECK   SZR
49 04466 060434          DIA     0,MUX
50 04467 062434          DIC     0,MUX
51 04470 024072          LDA     1,XMSK
52 04471 123414          AND#    1,0,SZR
53                       EHALT                       ;XMIT BIT  4 INCORRECT
54 04472 006230          JSR@    IERR?
55 04473 006231          LOOPX                       ;FROM DATA BIT 4 IN
56                                                   ;STORAGE
57               TR45:   TRSCH   5,C8.,SNR,C3025
58 04474 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 5
59 04475 000005          5
60 04476 062677          IORST
```

```
 0064  PSID
01                          TRANSMIT        LOOPBACK,NOPARITY,CODE8
02 04477 006155             JSR@    ITRMT
03 04500 100031 100000+LOOPBACK+NOPARITY+CODE8
04                          XCLK    C1
05 04501 020235             LDA     0,C1
06 04502 006123             JSR     @.STEP
07                          MUXCLKA C1
08 04503 020235             LDA     0,C1
09 04504 006121             JSR     @ICONT
10 04505 024333             LDA     1,C3025
11 04506 066034             DOB     1,MUX
12                          XCLK    C1
13 04507 020235             LDA     0,C1
14 04510 006123             JSR     @.STEP
15                          MUXCLKA C5
16 04511 020241             LDA     0,C5
17 04512 006121             JSR     @ICONT
18                          XCLK    C8.
19 04513 020244             LDA     0,C8.
20 04514 006123             JSR     @.STEP
21                          CHECK   SNR
22 04515 060434             DIA     0,MUX
23 04516 062434             DIC     0,MUX
24 04517 024072             LDA     1,XMSK
25 04520 123415             AND#    1,0,SNR
26                          EHALT                   ;XMIT BIT  5 INCORRECT
27 04521 006230             JSR@    IERR?
28 04522 006231             LOOPX                   ;FROM DATA BIT 5 IN
29                                                  ;STORAGE
30
31                  TR46:   TRSCH   6,C10.,SZR,C3025
32 04523 006226             JSR@    IENT?           ;XMIT SHIFT TO BIT 6
33 04524 000005             5
34 04525 062677             IORST
35                          TRANSMIT        LOOPBACK,NOPARITY,CODE8
36 04526 006155             JSR@    ITRMT
37 04527 100031 100000+LOOPBACK+NOPARITY+CODE8
38                          XCLK    C1
39 04530 020235             LDA     0,C1
40 04531 006123             JSR     @.STEP
41                          MUXCLKA C1
42 04532 020235             LDA     0,C1
43 04533 006121             JSR     @ICONT
44 04534 024333             LDA     1,C3025
45 04535 066034             DOB     1,MUX
46                          XCLK    C1
47 04536 020235             LDA     0,C1
48 04537 006123             JSR     @.STEP
49                          MUXCLKA C5
50 04540 020241             LDA     0,C5
51 04541 006121             JSR     @ICONT
52                          XCLK    C10.
53 04542 020246             LDA     0,C10.
54 04543 006123             JSR     @.STEP
55                          CHECK   SZR
56 04544 060434             DIA     0,MUX
57 04545 062434             DIC     0,MUX
58 04546 024072             LDA     1,XMSK
59 04547 123414             AND#    1,0,SZR
60                          EHALT                   ;XMIT BIT  6 INCORRECT
```

```
 0065  PSID
01 04550 006230          JSR@    IERR?
02 04551 006231          LOOPX                       ;FROM DATA BIT 6 IN
03                                                   ;STORAGE
04               TR47:   TRSCH   7,C12.,SNR,C3025
05 04552 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 7
06 04553 000005          5
07 04554 062677          IORST
08                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
09 04555 006155          JSR@    ITRMT
10 04556 100031 100000+LOOPBACK+NOPARITY+CODE8
11                       XCLK    C1
12 04557 020235          LDA     0,C1
13 04560 006123          JSR     @.STEP
14                       MUXCLKA C1
15 04561 020235          LDA     0,C1
16 04562 006121          JSR     @ICONT
17 04563 024333          LDA     1,C3025
18 04564 066034          DOB     1,MUX
19                       XCLK    C1
20 04565 020235          LDA     0,C1
21 04566 006123          JSR     @.STEP
22                       MUXCLKA C5
23 04567 020241          LDA     0,C5
24 04570 006121          JSR     @ICONT
25                       XCLK    C12.
26 04571 020250          LDA     0,C12.
27 04572 006123          JSR     @.STEP
28                       CHECK   SNR
29 04573 060434          DIA     0,MUX
30 04574 062434          DIC     0,MUX
31 04575 024072          LDA     1,XMSK
32 04576 123415          AND#    1,0,SNR
33                       EHALT                       ;XMIT BIT  7 INCORRECT
34 04577 006230          JSR@    IERR?
35 04600 006231          LOOPX                       ;FROM DATA BIT 7 IN
36                                                   ;STORAGE
37
38               TR48:   TRSCH   8.,C14.,SZR,C3025
39 04601 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 8.
40 04602 000005          5
41 04603 062677          IORST
42                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
43 04604 006155          JSR@    ITRMT
44 04605 100031 100000+LOOPBACK+NOPARITY+CODE8
45                       XCLK    C1
46 04606 020235          LDA     0,C1
47 04607 006123          JSR     @.STEP
48                       MUXCLKA C1
49 04610 020235          LDA     0,C1
50 04611 006121          JSR     @ICONT
51 04612 024333          LDA     1,C3025
52 04613 066034          DOB     1,MUX
53                       XCLK    C1
54 04614 020235          LDA     0,C1
55 04615 006123          JSR     @.STEP
56                       MUXCLKA C5
57 04616 020241          LDA     0,C5
58 04617 006121          JSR     @ICONT
59                       XCLK    C14.
60 04620 020252          LDA     0,C14.
```

```
 0066  PSID
01 04621 006123          JSR     @.STEP
02                       CHECK   SZR
03 04622 060434          DIA     0,MUX
04 04623 062434          DIC     0,MUX
05 04624 024072          LDA     1,XMSK
06 04625 123414          AND#    1,0,SZR
07                       EHALT                       ;XMIT BIT  8. INCORRECT
08 04626 006230          JSR@    IERR?
09 04627 006231          LOOPX                       ;FROM DATA BIT 8. IN
10                                                   ;STORAGE
11 04630 006226 TR49:    JSR@    IENT?               ;INVERT DLE AND REPEAT
12 04631 000005          5
13 04632 062677          IORST
14 04633 020102          LDA     0,TRADR
15 04634 061034          DOA     0,MUX
16 04635 024345          LDA     1,C140252
17 04636 067034          DOC     1,MUX
18                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
19 04637 006155          JSR@    ITRMT
20 04640 100031 100000+LOOPBACK+NOPARITY+CODE8
21                       XCLK    C1
22 04641 020235          LDA     0,C1
23 04642 006123          JSR     @.STEP
24                       MUXCLKA C1
25 04643 020235          LDA     0,C1
26 04644 006121          JSR     @ICONT
27 04645 024332          LDA     1,C30125
28 04646 066034          DOB     1,MUX
29                       XCLK    C1
30 04647 020235          LDA     0,C1
31 04650 006123          JSR     @.STEP
32                       MUXCLKA C5
33 04651 020241          LDA     0,C5
34 04652 006121          JSR     @ICONT
35                       CHECK   SZR
36 04653 060434          DIA     0,MUX
37 04654 062434          DIC     0,MUX
38 04655 024072          LDA     1,XMSK
39 04656 123414          AND#    1,0,SZR
40                       EHALT                       ;XMIT SHIFT REGISTER,DLE
41 04657 006230          JSR@    IERR?
42 04660 006231          LOOPX                       ;STORAGE
43
44               TR50:   TRSCH   2,C2,SNR,C3012
45 04661 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 2
46 04662 000005          5
47 04663 062677          IORST
48                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
49 04664 006155          JSR@    ITRMT
50 04665 100031 100000+LOOPBACK+NOPARITY+CODE8
51                       XCLK    C1
52 04666 020235          LDA     0,C1
53 04667 006123          JSR     @.STEP
54                       MUXCLKA C1
55 04670 020235          LDA     0,C1
56 04671 006121          JSR     @ICONT
57 04672 024332          LDA     1,C3012
58 04673 066034          DOB     1,MUX
59                       XCLK    C1
60 04674 020235          LDA     0,C1
```

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 0067  PSID
01 04675 006123          JSR     @.STEP
02                       MUXCLKA C5
03 04676 020241          LDA     0,C5
04 04677 006121          JSR     @ICONT
05                       XCLK    C2
06 04700 020236          LDA     0,C2
07 04701 006123          JSR     @.STEP
08                       CHECK   SNR
09 04702 060434          DIA     0,MUX
10 04703 062434          DIC     0,MUX
11 04704 024072          LDA     1,XMSK
12 04705 123415          AND#    1,0,SNR
13                       EHALT                       ;XMIT BIT  2 INCORRECT
14 04706 006230          JSR@    IERR?
15 04707 006231          LOOPX                       ;FROM DATA BIT 2 IN
16                                                   ;STORAGE
17               TR51:   TRSCH   3,C4,SZR,C3012
18 04710 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 3
19 04711 000005          5
20 04712 062677          IORST
21                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
22 04713 006155          JSR@    ITRMT
23 04714 100031 100000+LOOPBACK+NOPARITY+CODE8
24                       XCLK    C1
25 04715 020235          LDA     0,C1
26 04716 006123          JSR     @.STEP
27                       MUXCLKA C1
28 04717 020235          LDA     0,C1
29 04720 006121          JSR     @ICONT
30 04721 024332          LDA     1,C3012
31 04722 066034          DOB     1,MUX
32                       XCLK    C1
33 04723 020235          LDA     0,C1
34 04724 006123          JSR     @.STEP
35                       MUXCLKA C5
36 04725 020241          LDA     0,C5
37 04726 006121          JSR     @ICONT
38                       XCLK    C4
39 04727 020240          LDA     0,C4
40 04730 006123          JSR     @.STEP
41                       CHECK   SZR
42 04731 060434          DIA     0,MUX
43 04732 062434          DIC     0,MUX
44 04733 024072          LDA     1,XMSK
45 04734 123414          AND#    1,0,SZR
46                       EHALT                       ;XMIT BIT  3 INCORRECT
47 04735 006230          JSR@    IERR?
48 04736 006231          LOOPX                       ;FROM DATA BIT 3 IN
49                                                   ;STORAGE
50
51               TR52:   TRSCH   4,C6,SNR,C3012
52 04737 006226          JSR@    IENT?               ;XMIT SHIFT TO BIT 4
53 04740 000005          5
54 04741 062677          IORST
55                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
56 04742 006155          JSR@    ITRMT
57 04743 100031 100000+LOOPBACK+NOPARITY+CODE8
58                       XCLK    C1
59 04744 020235          LDA     0,C1
60 04745 006123          JSR     @.STEP
```

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 0068  PSID
01                          MUXCLKA C1
02 04746 020235             LDA     0,C1
03 04747 006121             JSR     @ICONT
04 04750 024332             LDA     1,C3012
05 04751 066034             DOB     1,MUX
06                          XCLK    C1
07 04752 020235             LDA     0,C1
08 04753 006123             JSR     @.STEP
09                          MUXCLKA C5
10 04754 020241             LDA     0,C5
11 04755 006121             JSR     @ICONT
12                          XCLK    C6
13 04756 020242             LDA     0,C6
14 04757 006123             JSR     @.STEP
15                          CHECK   SNR
16 04760 060434             DIA     0,MUX
17 04761 062434             DIC     0,MUX
18 04762 024072             LDA     1,XMSK
19 04763 123415             AND#    1,0,SNR
20                          EHALT                       ;XMIT BIT  4 INCORRECT
21 04764 006230             JSR@    IERR?
22 04765 006231             LOOPX                       ;FROM DATA BIT 4 IN
23                                                      ;STORAGE
24
25                  TR53:   TRSCH   5,C8.,SZR,C3012
26 04766 006226             JSR@    IENT?               ;XMIT SHIFT TO BIT 5
27 04767 000005             5
28 04770 062677             IORST
29                          TRANSMIT        LOOPBACK,NOPARITY,CODE8
30 04771 006155             JSR@    ITRMT
31 04772 100031 100000+LOOPBACK+NOPARITY+CODE8
32                          XCLK    C1
33 04773 020235             LDA     0,C1
34 04774 006123             JSR     @.STEP
35                          MUXCLKA C1
36 04775 020235             LDA     0,C1
37 04776 006121             JSR     @ICONT
38 04777 024332             LDA     1,C3012
39 05000 066034             DOB     1,MUX
40                          XCLK    C1
41 05001 020235             LDA     0,C1
42 05002 006123             JSR     @.STEP
43                          MUXCLKA C5
44 05003 020241             LDA     0,C5
45 05004 006121             JSR     @ICONT
46                          XCLK    C8.
47 05005 020244             LDA     0,C8.
48 05006 006123             JSR     @.STEP
49                          CHECK   SZR
50 05007 060434             DIA     0,MUX
51 05010 062434             DIC     0,MUX
52 05011 024072             LDA     1,XMSK
53 05012 123414             AND#    1,0,SZR
54                          EHALT                       ;XMIT BIT  5 INCORRECT
55 05013 006230             JSR@    IERR?
56 05014 006231             LOOPX                       ;FROM DATA BIT 5 IN
57                                                      ;STORAGE
58
59                  TR54:   TRSCH   6,C10.,SNR,C3012
60 05015 006226             JSR@    IENT?               ;XMIT SHIFT TO BIT 6
```

```
 0069  PSID
01 05016 000005          5
02 05017 062677          IORST
03                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
04 05020 006155          JSR@    ITRMT
05 05021 100031 100000+LOOPBACK+NOPARITY+CODE8
06                       XCLK    C1
07 05022 020235          LDA     0,C1
08 05023 006123          JSR     @.STEP
09                       MUXCLKA C1
10 05024 020235          LDA     0,C1
11 05025 006121          JSR     @ICONT
12 05026 024332          LDA     1,C3012
13 05027 066034          DOB     1,MUX
14                       XCLK    C1
15 05030 020235          LDA     0,C1
16 05031 006123          JSR     @.STEP
17                       MUXCLKA C5
18 05032 020241          LDA     0,C5
19 05033 006121          JSR     @ICONT
20                       XCLK    C10.
21 05034 020246          LDA     0,C10.
22 05035 006123          JSR     @.STEP
23                       CHECK   SNR
24 05036 060434          DIA     0,MUX
25 05037 062434          DIC     0,MUX
26 05040 024072          LDA     1,XMSK
27 05041 123415          AND#    1,0,SNR
28                       EHALT                   ;XMIT BIT  6 INCORRECT
29 05042 006230          JSR@    IERR?
30 05043 006231          LOOPX                   ;FROM DATA BIT 6 IN
31                                               ;STORAGE
32
33               TR55:   TRSCH   7,C12.,SZR,C3012
34 05044 006226          JSR@    IENT?           ;XMIT SHIFT TO BIT 7
35 05045 000005          5
36 05046 062677          IORST
37                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
38 05047 006155          JSR@    ITRMT
39 05050 100031 100000+LOOPBACK+NOPARITY+CODE8
40                       XCLK    C1
41 05051 020235          LDA     0,C1
42 05052 006123          JSR     @.STEP
43                       MUXCLKA C1
44 05053 020235          LDA     0,C1
45 05054 006121          JSR     @ICONT
46 05055 024332          LDA     1,C3012
47 05056 066034          DOB     1,MUX
48                       XCLK    C1
49 05057 020235          LDA     0,C1
50 05060 006123          JSR     @.STEP
51                       MUXCLKA C5
52 05061 020241          LDA     0,C5
53 05062 006121          JSR     @ICONT
54                       XCLK    C12.
55 05063 020250          LDA     0,C12.
56 05064 006123          JSR     @.STEP
57                       CHECK   SZR
58 05065 060434          DIA     0,MUX
59 05066 062434          DIC     0,MUX
60 05067 024072          LDA     1,XMSK
```

```
 0070  PSID
01 05070 123414          AND#    1,0,SZR
02                       EHALT                   ;XMIT BIT  7 INCORRECT
03 05071 006230          JSR@    IERR?
04 05072 006231          LOOPX                   ;FROM DATA BIT 7 IN
05                                               ;STORAGE
06               TR56:   TRSCH   8.,C14.,SNR,C3012
07 05073 006226          JSR@    IENT?           ;XMIT SHIFT TO BIT 8.
08 05074 000005          5
09 05075 062677          IORST
10                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
11 05076 006155          JSR@    ITRMT
12 05077 100031 100000+LOOPBACK+NOPARITY+CODE8
13                       XCLK    C1
14 05100 020235          LDA     0,C1
15 05101 006123          JSR     @.STEP
16                       MUXCLKA C1
17 05102 020235          LDA     0,C1
18 05103 006121          JSR     @ICONT
19 05104 024332          LDA     1,C3012
20 05105 066034          DOB     1,MUX
21                       XCLK    C1
22 05106 020235          LDA     0,C1
23 05107 006123          JSR     @.STEP
24                       MUXCLKA C5
25 05110 020241          LDA     0,C5
26 05111 006121          JSR     @ICONT
27                       XCLK    C14.
28 05112 020252          LDA     0,C14.
29 05113 006123          JSR     @.STEP
30                       CHECK   SNR
31 05114 060434          DIA     0,MUX
32 05115 062434          DIC     0,MUX
33 05116 024072          LDA     1,XMSK
34 05117 123415          AND#    1,0,SNR
35                       EHALT                   ;XMIT BIT  8. INCORRECT
36 05120 006230          JSR@    IERR?
37 05121 006231          LOOPX                   ;FROM DATA BIT 8. IN
38                                               ;STORAGE
39 05122 006226 TR57:    JSR@    IENT?           ;CHECK CHAR. IS FORCED, NOT SYN
40 05123 000005          5
41 05124 062677          IORST
42 05125 020102          LDA     0,TRADR
43 05126 061034          DOA     0,MUX
44 05127 024335          LDA     1,C40125        ;CHANGE SYN CHAR.
45 05130 067034          DOC     1,MUX
46                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
47 05131 006155          JSR@    ITRMT
48 05132 100031 100000+LOOPBACK+NOPARITY+CODE8
49                       XCLK    C1
50 05133 020235          LDA     0,C1
51 05134 006123          JSR     @.STEP
52                       MUXCLKA C1
53 05135 020235          LDA     0,C1
54 05136 006121          JSR     @ICONT
55 05137 024333          LDA     1,C30252
56 05140 066034          DOB     1,MUX
57                       XCLK    C1
58 05141 020235          LDA     0,C1
59 05142 006123          JSR     @.STEP
60                       MUXCLKA C5
```

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 0071  PSID
01 05143 020241          LDA     0,C5
02 05144 006121          JSR     @ICONT
03                       XCLK    C13.
04 05145 020251          LDA     0,C13.
05 05146 006123          JSR     @.STEP
06                       MUXCLKA C1
07 05147 020235          LDA     0,C1
08 05150 006121          JSR     @ICONT
09                       XCLK    C3
10 05151 020237          LDA     0,C3
11 05152 006123          JSR     @.STEP
12                       MUXCLKA C5
13 05153 020241          LDA     0,C5
14 05154 006121          JSR     @ICONT
15                       CHECK   SZR
16 05155 060434          DIA     0,MUX
17 05156 062434          DIC     0,MUX
18 05157 024072          LDA     1,XMSK
19 05160 123414          AND#    1,0,SZR
20                       EHALT                           ;ROM, F1, F0
21 05161 006230          JSR@    IERR?
22 05162 006231          LOOPX
23
24
25 05163 006226 TR58:    JSR@    IENT?                   ;SECOND BIT OF FORCED CHAR.
26 05164 000005          5
27 05165 062677          IORST
28                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
29 05166 006155          JSR@    ITRMT
30 05167 100031 100000+LOOPBACK+NOPARITY+CODE8
31                       XCLK    C1
32 05170 020235          LDA     0,C1
33 05171 006123          JSR     @.STEP
34                       MUXCLKA C1
35 05172 020235          LDA     0,C1
36 05173 006121          JSR     @ICONT
37 05174 024333          LDA     1,C30252
38 05175 066034          DOB     1,MUX
39                       XCLK    C1
40 05176 020235          LDA     0,C1
41 05177 006123          JSR     @.STEP
42                       MUXCLKA C5
43 05200 020241          LDA     0,C5
44 05201 006121          JSR     @ICONT
45                       XCLK    C13.
46 05202 020251          LDA     0,C13.
47 05203 006123          JSR     @.STEP
48                       MUXCLKA C1
49 05204 020235          LDA     0,C1
50 05205 006121          JSR     @ICONT
51                       XCLK    C3
52 05206 020237          LDA     0,C3
53 05207 006123          JSR     @.STEP
54                       MUXCLKA C5
55 05210 020241          LDA     0,C5
56 05211 006121          JSR     @ICONT
57                       XCLK    C2
58 05212 020236          LDA     0,C2
59 05213 006123          JSR     @.STEP
60                       CHECK   SNR
```

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 0072  PSID
01 05214 060434          DIA     0,MUX
02 05215 062434          DIC     0,MUX
03 05216 024072          LDA     1,XMSK
04 05217 123415          AND#    1,0,SNR
05                       EHALT                   ;ROM, F1, F0
06 05220 006230          JSR@    IERR?
07 05221 006231          LOOPX
08 05222 006226 TR59:    JSR@    IENT?           ;CHECK FORCED DLE-SYN
09 05223 000005          5
10 05224 062677          IORST
11                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
12 05225 006155          JSR@    ITRMT
13 05226 100031 100000+LOOPBACK+NOPARITY+CODE8
14                       XCLK    C1
15 05227 020235          LDA     0,C1
16 05230 006123          JSR     @.STEP
17                       MUXCLKA C1
18 05231 020235          LDA     0,C1
19 05232 006121          JSR     @ICONT
20 05233 024332          LDA     1,C30125
21 05234 066034          DOB     1,MUX
22                       XCLK    C1
23 05235 020235          LDA     0,C1
24 05236 006123          JSR     @.STEP
25                       MUXCLKA C5
26 05237 020241          LDA     0,C5
27 05240 006121          JSR     @ICONT
28                       XCLK    C13.
29 05241 020251          LDA     0,C13.
30 05242 006123          JSR     @.STEP
31                       MUXCLKA C1
32 05243 020235          LDA     0,C1
33 05244 006121          JSR     @ICONT
34                       XCLK    C3
35 05245 020237          LDA     0,C3
36 05246 006123          JSR     @.STEP
37                       MUXCLKA C5              ;DLE
38 05247 020241          LDA     0,C5
39 05250 006121          JSR     @ICONT
40                       XCLK    C13.
41 05251 020251          LDA     0,C13.
42 05252 006123          JSR     @.STEP
43                       MUXCLKA C1
44 05253 020235          LDA     0,C1
45 05254 006121          JSR     @ICONT
46                       XCLK    C3
47 05255 020237          LDA     0,C3
48 05256 006123          JSR     @.STEP
49                       MUXCLKA C5              ;CHARACTER
50 05257 020241          LDA     0,C5
51 05260 006121          JSR     @ICONT
52                       CHECK   SZR             ;DLE AGAIN
53 05261 060434          DIA     0,MUX
54 05262 062434          DIC     0,MUX
55 05263 024072          LDA     1,XMSK
56 05264 123414          AND#    1,0,SZR
57                       EHALT                   ;XPARENT, ROM, XBIT, CHANGE,
58 05265 006230          JSR@    IERR?
59 05266 006231          LOOPX                   ;XMIT SHIFT REGISTER
60 05267 006226 TR60:    JSR@    IENT?           ;SECOND BIT
```

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 0073  PSID
01 05270 000005          5
02 05271 062677          IORST
03                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
04 05272 006155          JSR@    ITRMT
05 05273 100031 100000+LOOPBACK+NOPARITY+CODE8
06                       XCLK    C1
07 05274 020235          LDA     0,C1
08 05275 006123          JSR     @.STEP
09                       MUXCLKA C1
10 05276 020235          LDA     0,C1
11 05277 006121          JSR     @ICONT
12 05300 024332          LDA     1,C30125
13 05301 066034          DOB     1,MUX
14                       XCLK    C1
15 05302 020235          LDA     0,C1
16 05303 006123          JSR     @.STEP
17                       MUXCLKA C5
18 05304 020241          LDA     0,C5
19 05305 006121          JSR     @ICONT
20                       XCLK    C13.
21 05306 020251          LDA     0,C13.
22 05307 006123          JSR     @.STEP
23                       MUXCLKA C1
24 05310 020235          LDA     0,C1
25 05311 006121          JSR     @ICONT
26                       XCLK    C3
27 05312 020237          LDA     0,C3
28 05313 006123          JSR     @.STEP
29                       MUXCLKA C5
30 05314 020241          LDA     0,C5
31 05315 006121          JSR     @ICONT
32                       XCLK    C13.
33 05316 020251          LDA     0,C13.
34 05317 006123          JSR     @.STEP
35                       MUXCLKA C1
36 05320 020235          LDA     0,C1
37 05321 006121          JSR     @ICONT
38                       XCLK    C3
39 05322 020237          LDA     0,C3
40 05323 006123          JSR     @.STEP
41                       MUXCLKA C5
42 05324 020241          LDA     0,C5
43 05325 006121          JSR     @ICONT
44                       XCLK    C2
45 05326 020236          LDA     0,C2
46 05327 006123          JSR     @.STEP
47                       CHECK   SNR             ;BIT  2 OF DLE
48 05330 060434          DIA     0,MUX
49 05331 062434          DIC     0,MUX
50 05332 024072          LDA     1,XMSK
51 05333 123415          AND#    1,0,SNR
52                       EHALT                   ;XPARENT, ROM, XBIT, CHANGE,
53 05334 006230          JSR@    IERR?
54 05335 006231          LOOPX                   ;XMIT SHIFT REGISTER
55 05336 006226 TR61:    JSR@    IENT?           ;CHECK FORCED SYN CHARACTER
56 05337 000005          5
57 05340 062677          IORST
58                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
59 05341 006155          JSR@    ITRMT
60 05342 100031 100000+LOOPBACK+NOPARITY+CODE8
```

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 0074  PSID
01                          XCLK    C1
02 05343 020235             LDA     0,C1
03 05344 006123             JSR     @.STEP
04                          MUXCLKA C1
05 05345 020235             LDA     0,C1
06 05346 006121             JSR     @ICONT
07 05347 024333             LDA     1,C30252
08 05350 066034             DOB     1,MUX
09                          XCLK    C1
10 05351 020235             LDA     0,C1
11 05352 006123             JSR     @.STEP
12                          MUXCLKA C5
13 05353 020241             LDA     0,C5
14 05354 006121             JSR     @ICONT
15                          XCLK    C13.
16 05355 020251             LDA     0,C13.
17 05356 006123             JSR     @.STEP
18                          MUXCLKA C1
19 05357 020235             LDA     0,C1
20 05360 006121             JSR     @ICONT
21                          XCLK    C3
22 05361 020237             LDA     0,C3
23 05362 006123             JSR     @.STEP
24                          MUXCLKA C5
25 05363 020241             LDA     0,C5
26 05364 006121             JSR     @ICONT
27                          XCLK    C13.
28 05365 020251             LDA     0,C13.
29 05366 006123             JSR     @.STEP
30                          MUXCLKA C1
31 05367 020235             LDA     0,C1
32 05370 006121             JSR     @ICONT
33                          XCLK    C3
34 05371 020237             LDA     0,C3
35 05372 006123             JSR     @.STEP
36                          MUXCLKA C5
37 05373 020241             LDA     0,C5
38 05374 006121             JSR     @ICONT
39                          XCLK    C13.
40 05375 020251             LDA     0,C13.
41 05376 006123             JSR     @.STEP
42                          MUXCLKA C1
43 05377 020235             LDA     0,C1
44 05400 006121             JSR     @ICONT
45                          XCLK    C3
46 05401 020237             LDA     0,C3
47 05402 006123             JSR     @.STEP
48                          MUXCLKA C5
49 05403 020241             LDA     0,C5
50 05404 006121             JSR     @ICONT
51                          CHECK   SNR
52 05405 060434             DIA     0,MUX
53 05406 062434             DIC     0,MUX
54 05407 024072             LDA     1,XMSK
55 05410 123415             AND#    1,0,SNR
56                          EHALT                   ;XPARENT, ROM, XMIT SHIFT
57 05411 006230             JSR@    IERR?
58 05412 006231             LOOPX                   ;REGISTER
59
60 05413 006226 TR62:       JSR@    IENT?           ;SECOND BIT
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 0075  PSID
01 05414 000005          5
02 05415 062677          IORST
03                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
04 05416 006155          JSR@    ITRMT
05 05417 100031 100000+LOOPBACK+NOPARITY+CODE8
06                       XCLK    C1
07 05420 020235          LDA     0,C1
08 05421 006123          JSR     @.STEP
09                       MUXCLKA C1
10 05422 020235          LDA     0,C1
11 05423 006121          JSR     @ICONT
12 05424 024333          LDA     1,C30252
13 05425 066034          DOB     1,MUX
14                       XCLK    C1
15 05426 020235          LDA     0,C1
16 05427 006123          JSR     @.STEP
17                       MUXCLKA C5
18 05430 020241          LDA     0,C5
19 05431 006121          JSR     @ICONT
20                       XCLK    C13.
21 05432 020251          LDA     0,C13.
22 05433 006123          JSR     @.STEP
23                       MUXCLKA C1
24 05434 020235          LDA     0,C1
25 05435 006121          JSR     @ICONT
26                       XCLK    C3
27 05436 020237          LDA     0,C3
28 05437 006123          JSR     @.STEP
29                       MUXCLKA C5
30 05440 020241          LDA     0,C5
31 05441 006121          JSR     @ICONT
32                       XCLK    C13.
33 05442 020251          LDA     0,C13.
34 05443 006123          JSR     @.STEP
35                       MUXCLKA C1
36 05444 020235          LDA     0,C1
37 05445 006121          JSR     @ICONT
38                       XCLK    C3
39 05446 020237          LDA     0,C3
40 05447 006123          JSR     @.STEP
41                       MUXCLKA C5
42 05450 020241          LDA     0,C5
43 05451 006121          JSR     @ICONT
44                       XCLK    C13.
45 05452 020251          LDA     0,C13.
46 05453 006123          JSR     @.STEP
47                       MUXCLKA C1
48 05454 020235          LDA     0,C1
49 05455 006121          JSR     @ICONT
50                       XCLK    C3
51 05456 020237          LDA     0,C3
52 05457 006123          JSR     @.STEP
53                       MUXCLKA C5
54 05460 020241          LDA     0,C5
55 05461 006121          JSR     @ICONT
56                       XCLK    C2
57 05462 020236          LDA     0,C2
58 05463 006123          JSR     @.STEP
59                       CHECK   SZR
60 05464 060434          DIA     0,MUX
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 0076  PSID
01 05465 062434          DIC     0,MUX
02 05466 024072          LDA     1,XMSK
03 05467 123414          AND#    1,0,SZR
04                       EHALT                   ;XMIT SHIFT REGISTER
05 05470 006230          JSR@    IERR?
06 05471 006231          LOOPX
07 05472 006226 TR63:    JSR@    IENT?           ;XMIT DLE-CHAR., DLE-CHAR.
08 05473 000005          5
09 05474 062677          IORST
10                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
11 05475 006155          JSR@    ITRMT
12 05476 100031 100000+LOOPBACK+NOPARITY+CODE8
13                       XCLK    C1
14 05477 020235          LDA     0,C1
15 05500 006123          JSR     @.STEP
16                       MUXCLKA C1
17 05501 020235          LDA     0,C1
18 05502 006121          JSR     @ICONT
19 05503 024332          LDA     1,C30125
20 05504 066034          DOB     1,MUX
21                       XCLK    C1
22 05505 020235          LDA     0,C1
23 05506 006123          JSR     @.STEP
24                       MUXCLKA C5
25 05507 020241          LDA     0,C5
26 05510 006121          JSR     @ICONT
27                       XCLK    C13.
28 05511 020251          LDA     0,C13.
29 05512 006123          JSR     @.STEP
30                       MUXCLKA C1
31 05513 020235          LDA     0,C1
32 05514 006121          JSR     @ICONT
33                       XCLK    C3
34 05515 020237          LDA     0,C3
35 05516 006123          JSR     @.STEP
36                       MUXCLKA C5
37 05517 020241          LDA     0,C5
38 05520 006121          JSR     @ICONT
39                       XCLK    C13.
40 05521 020251          LDA     0,C13.
41 05522 006123          JSR     @.STEP
42 05523 024330          LDA     1,C20125
43 05524 066034          DOB     1,MUX
44                       MUXCLKA C1
45 05525 020235          LDA     0,C1
46 05526 006121          JSR     @ICONT
47                       XCLK    C3
48 05527 020237          LDA     0,C3
49 05530 006123          JSR     @.STEP
50                       MUXCLKA C5
51 05531 020241          LDA     0,C5
52 05532 006121          JSR     @ICONT
53                       CHECK   SZR             ;CHECK DLE CHARACTER
54 05533 060434          DIA     0,MUX
55 05534 062434          DIC     0,MUX
56 05535 024072          LDA     1,XMSK
57 05536 123414          AND#    1,0,SZR
58                       EHALT                   ;XPARENT, XMIT SHIFT REGISTER,
59 05537 006230          JSR@    IERR?
60 05540 006231          LOOPX                   ;DATA STORAGE, ROM
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 0077  PSID
01
02 05541 006226 TR64:   JSR@    IENT?           ;CHECK SECOND BIT
03 05542 000005         5
04 05543 062677         IORST
05                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
06 05544 006155         JSR@    ITRMT
07 05545 100031 100000+LOOPBACK+NOPARITY+CODE8
08                      XCLK    C1
09 05546 020235         LDA     0,C1
10 05547 006123         JSR     @.STEP
11                      MUXCLKA C1
12 05550 020235         LDA     0,C1
13 05551 006121         JSR     @ICONT
14 05552 024332         LDA     1,C30125
15 05553 066034         DOB     1,MUX
16                      XCLK    C1
17 05554 020235         LDA     0,C1
18 05555 006123         JSR     @.STEP
19                      MUXCLKA C5
20 05556 020241         LDA     0,C5
21 05557 006121         JSR     @ICONT
22                      XCLK    C13.
23 05560 020251         LDA     0,C13.
24 05561 006123         JSR     @.STEP
25                      MUXCLKA C1
26 05562 020235         LDA     0,C1
27 05563 006121         JSR     @ICONT
28                      XCLK    C3
29 05564 020237         LDA     0,C3
30 05565 006123         JSR     @.STEP
31                      MUXCLKA C5
32 05566 020241         LDA     0,C5
33 05567 006121         JSR     @ICONT
34                      XCLK    C13.
35 05570 020251         LDA     0,C13.
36 05571 006123         JSR     @.STEP
37 05572 024330         LDA     1,C20125
38 05573 066034         DOB     1,MUX
39                      MUXCLKA C1
40 05574 020235         LDA     0,C1
41 05575 006121         JSR     @ICONT
42                      XCLK    C3
43 05576 020237         LDA     0,C3
44 05577 006123         JSR     @.STEP
45                      MUXCLKA C5
46 05600 020241         LDA     0,C5
47 05601 006121         JSR     @ICONT
48                      XCLK    C2
49 05602 020236         LDA     0,C2
50 05603 006123         JSR     @.STEP
51                      CHECK   SNR
52 05604 060434         DIA     0,MUX
53 05605 062434         DIC     0,MUX
54 05606 024072         LDA     1,XMSK
55 05607 123415         AND#    1,0,SNR
56                      EHALT                   ;XMIT SHIFT REGISTER
57 05610 006230         JSR@    IERR?
58 05611 006231         LOOPX
59 05612 006226 TR65:   JSR@    IENT?           ;CHECK SECOND CHAR.XMITTED
60 05613 000005         5
```

```
 0078  PSID
01 05614 062677          IORST
02                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
03 05615 006155          JSR@    ITRMT
04 05616 100031 100000+LOOPBACK+NOPARITY+CODE8
05                       XCLK    C1
06 05617 020235          LDA     0,C1
07 05620 006123          JSR     @.STEP
08                       MUXCLKA C1
09 05621 020235          LDA     0,C1
10 05622 006121          JSR     @ICONT
11 05623 024333          LDA     1,C30252
12 05624 066034          DOB     1,MUX
13                       XCLK    C1
14 05625 020235          LDA     0,C1
15 05626 006123          JSR     @.STEP
16                       MUXCLKA C5
17 05627 020241          LDA     0,C5
18 05630 006121          JSR     @ICONT
19                       XCLK    C13.
20 05631 020251          LDA     0,C13.
21 05632 006123          JSR     @.STEP
22                       MUXCLKA C1
23 05633 020235          LDA     0,C1
24 05634 006121          JSR     @ICONT
25                       XCLK    C3
26 05635 020237          LDA     0,C3
27 05636 006123          JSR     @.STEP
28                       MUXCLKA C5
29 05637 020241          LDA     0,C5
30 05640 006121          JSR     @ICONT
31                       XCLK    C13.
32 05641 020251          LDA     0,C13.
33 05642 006123          JSR     @.STEP
34 05643 024331          LDA     1,C20252
35 05644 066034          DOB     1,MUX
36                       MUXCLKA C1
37 05645 020235          LDA     0,C1
38 05646 006121          JSR     @ICONT
39                       XCLK    C3
40 05647 020237          LDA     0,C3
41 05650 006123          JSR     @.STEP
42                       MUXCLKA C5
43 05651 020241          LDA     0,C5
44 05652 006121          JSR     @ICONT
45                       XCLK    C13.
46 05653 020251          LDA     0,C13.
47 05654 006123          JSR     @.STEP
48                       MUXCLKA C1
49 05655 020235          LDA     0,C1
50 05656 006121          JSR     @ICONT
51                       XCLK    C3
52 05657 020237          LDA     0,C3
53 05660 006123          JSR     @.STEP
54                       MUXCLKA C5
55 05661 020241          LDA     0,C5
56 05662 006121          JSR     @ICONT
57                       CHECK   SZR
58 05663 060434          DIA     0,MUX
59 05664 062434          DIC     0,MUX
60 05665 024072          LDA     1,XMSK
```

```
0079  PSTD
01 05666 123414          AND#    1,0,SZR
02                       EHALT                   ;XMIT SHIFT REGISTER
03 05667 006230          JSR@    IERR?
04 05670 006231          LOOPX                   ;DATA STORAGE
05 05671 006226 TR66:    JSR@    IENT?           ;SECOND BIT OF SECOND CHAR
06 05672 000005          5
07 05673 062677          IORST
08                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
09 05674 006155          JSR@    ITRMT
10 05675 100031 100000+LOOPBACK+NOPARITY+CODE8
11                       XCLK    C1
12 05676 020235          LDA     0,C1
13 05677 006123          JSR     @.STEP
14                       MUXCLA  C1
15 05700 020235          LDA     0,C1
16 05701 006121          JSR     @ICONT
17 05702 024333          LDA     1,C30252
18 05703 066034          DOB     1,MUX
19                       XCLK    C1
20 05704 020235          LDA     0,C1
21 05705 006123          JSR     @.STEP
22                       MUXCLKA C5
23 05706 020241          LDA     0,C5
24 05707 006121          JSR     @ICONT
25                       XCLK    C13.
26 05710 020251          LDA     0,C13.
27 05711 006123          JSR     @.STEP
28                       MUXCLA  C1
29 05712 020235          LDA     0,C1
30 05713 006121          JSR     @ICONT
31                       XCLK    C3
32 05714 020237          LDA     0,C3
33 05715 006123          JSR     @.STEP
34                       MUXCLKA C5
35 05716 020241          LDA     0,C5
36 05717 006121          JSR     @ICONT
37                       XCLK    C13.
38 05720 020251          LDA     0,C13.
39 05721 006123          JSR     @.STEP
40 05722 024331          LDA     1,C20252
41 05723 066034          DOB     1,MUX
42                       MUXCLA  C1
43 05724 020235          LDA     0,C1
44 05725 006121          JSR     @ICONT
45                       XCLK    C3
46 05726 020237          LDA     0,C3
47 05727 006123          JSR     @.STEP
48                       MUXCLKA C5
49 05730 020241          LDA     0,C5
50 05731 006121          JSR     @ICONT
51                       XCLK    C13.
52 05732 020251          LDA     0,C13.
53 05733 006123          JSR     @.STEP
54                       MUXCLA  C1
55 05734 020235          LDA     0,C1
56 05735 006121          JSR     @ICONT
57                       XCLK    C3
58 05736 020237          LDA     0,C3
59 05737 006123          JSR     @.STEP
60                       MUXCLKA C5
```

```
 0080  PSID
01 05740 020241          LDA     0,C5
02 05741 006121          JSR     @ICONT
03                       XCLK    C2
04 05742 020236          LDA     0,C2
05 05743 006123          JSR     @.STEP
06                       CHECK   SNR
07 05744 060434          DIA     0,MUX
08 05745 062434          DIC     0,MUX
09 05746 024072          LDA     1,XMSK
10 05747 123415          AND#    1,0,SNR
11                       EHALT                   ;XMIT SHIFT REGISTER
12 05750 006230          JSR@    IERR?
13 05751 006231          LOOPX
14 05752 006226 TR67:    JSR@    IENT?           ;CHECK GETTING OUT OF XPARENCY
15 05753 000005          5
16 05754 062677          IORST
17                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
18 05755 006155          JSR@    ITRMT
19 05756 100031 100000+LOOPBACK+NOPARITY+CODE8
20                       XCLK    C1
21 05757 020235          LDA     0,C1
22 05760 006123          JSR     @.STEP
23                       MUXCLKA C1
24 05761 020235          LDA     0,C1
25 05762 006121          JSR     @ICONT
26 05763 024333          LDA     1,C30252
27 05764 066034          DOB     1,MUX
28                       XCLK    C1
29 05765 020235          LDA     0,C1
30 05766 006123          JSR     @.STEP
31                       MUXCLKA C5
32 05767 020241          LDA     0,C5
33 05770 006121          JSR     @ICONT
34                       XCLK    C13.
35 05771 020251          LDA     0,C13.
36 05772 006123          JSR     @.STEP
37                       MUXCLKA C1
38 05773 020235          LDA     0,C1
39 05774 006121          JSR     @ICONT
40                       XCLK    C3
41 05775 020237          LDA     0,C3
42 05776 006123          JSR     @.STEP
43                       MUXCLKA C5
44 05777 020241          LDA     0,C5
45 06000 006121          JSR     @ICONT
46                       XCLK    C13.
47 06001 020251          LDA     0,C13.
48 06002 006123          JSR     @.STEP
49 06003 024331          LDA     1,C20252
50 06004 066034          DOB     1,MUX
51                       MUXCLKA C1
52 06005 020235          LDA     0,C1
53 06006 006121          JSR     @ICONT
54                       XCLK    C3
55 06007 020237          LDA     0,C3
56 06010 006123          JSR     @.STEP
57                       MUXCLKA C5
58 06011 020241          LDA     0,C5
59 06012 006121          JSR     @ICONT
60                       XCLK    C13.
```

```
 0081  PSID
01 06013 020251          LDA     0,C13.
02 06014 006123          JSR     @.STEP
03                       MUXCLKA C1
04 06015 020235          LDA     0,C1
05 06016 006121          JSR     @ICONT
06                       XCLK    C3
07 06017 020237          LDA     0,C3
08 06020 006123          JSR     @.STEP
09                       MUXCLKA C5
10 06021 020241          LDA     0,C5
11 06022 006121          JSR     @ICONT
12                       XCLK    C13.
13 06023 020251          LDA     0,C13.
14 06024 006123          JSR     @.STEP
15                       MUXCLKA C1
16 06025 020235          LDA     0,C1
17 06026 006121          JSR     @ICONT
18                       XCLK    C3
19 06027 020237          LDA     0,C3
20 06030 006123          JSR     @.STEP
21                       MUXCLKA C5
22 06031 020241          LDA     0,C5
23 06032 006121          JSR     @ICONT
24                       CHECK   SNR             ;SHOULD BE SYN CHARACTER
25 06033 060434          DIA     0,MUX
26 06034 062434          DIC     0,MUX
27 06035 024072          LDA     1,XMSK
28 06036 123415          AND#    1,0,SNR
29                       EHALT                   ;-(XBIT), ROM
30 06037 006230          JSR@    IERR?
31 06040 006231          LOOPX
32 06041 006226 TR68:    JSR@    IENT?           ;SECOND BIT OF SYNC WORD
33 06042 000005          5
34 06043 062677          IORST
35                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
36 06044 006155          JSR@    ITRMT
37 06045 100031 100000+LOOPBACK+NOPARITY+CODE8
38                       XCLK    C1
39 06046 020235          LDA     0,C1
40 06047 006123          JSR     @.STEP
41                       MUXCLKA C1
42 06050 020235          LDA     0,C1
43 06051 006121          JSR     @ICONT
44 06052 024333          LDA     1,C30252
45 06053 066034          DOB     1,MUX
46                       XCLK    C1
47 06054 020235          LDA     0,C1
48 06055 006123          JSR     @.STEP
49                       MUXCLKA C5
50 06056 020241          LDA     0,C5
51 06057 006121          JSR     @ICONT
52                       XCLK    C13.
53 06060 020251          LDA     0,C13.
54 06061 006123          JSR     @.STEP
55                       MUXCLKA C1
56 06062 020235          LDA     0,C1
57 06063 006121          JSR     @ICONT
58                       XCLK    C3
59 06064 020237          LDA     0,C3
60 06065 006123          JSR     @.STEP
```

```
 0082  PSID
01                          MUXCLKA C5
02 06066 020241             LDA     0,C5
03 06067 006121             JSR     @ICONT
04                          XCLK    C13.
05 06070 020251             LDA     0,C13.
06 06071 006123             JSR     @.STEP
07 06072 024331             LDA     1,C20252
08 06073 066034             DOB     1,MUX
09                          MUXCLKA C1
10 06074 020235             LDA     0,C1
11 06075 006121             JSR     @ICONT
12                          XCLK    C3
13 06076 020237             LDA     0,C3
14 06077 006123             JSR     @.STEP
15                          MUXCLKA C5
16 06100 020241             LDA     0,C5
17 06101 006121             JSR     @ICONT
18                          XCLK    C13.
19 06102 020251             LDA     0,C13.
20 06103 006123             JSR     @.STEP
21                          MUXCLKA C1
22 06104 020235             LDA     0,C1
23 06105 006121             JSR     @ICONT
24                          XCLK    C3
25 06106 020237             LDA     0,C3
26 06107 006123             JSR     @.STEP
27                          MUXCLKA C5
28 06110 020241             LDA     0,C5
29 06111 006121             JSR     @ICONT
30                          XCLK    C13.
31 06112 020251             LDA     0,C13.
32 06113 006123             JSR     @.STEP
33                          MUXCLKA C1
34 06114 020235             LDA     0,C1
35 06115 006121             JSR     @ICONT
36                          XCLK    C3
37 06116 020237             LDA     0,C3
38 06117 006123             JSR     @.STEP
39                          MUXCLKA C5
40 06120 020241             LDA     0,C5
41 06121 006121             JSR     @ICONT
42                          XCLK    C2
43 06122 020236             LDA     0,C2
44 06123 006123             JSR     @.STEP
45                          CHECK   SZR
46 06124 060434             DIA     0,MUX
47 06125 062434             DIC     0,MUX
48 06126 024072             LDA     1,XMSK
49 06127 123414             AND#    1,0,SZR
50                          EHALT                   ;-(XBIT), XMIT SHIFT REGISTER
51 06130 006230             JSR@    IERR?
52 06131 006231             LOOPX
53 06132 000401             JMP     TR69
54                  TR69:   SYNC    SY026           ;CHECK 6 LEVEL CODE XMIT
55 06133 006226             JSR@    IENT?
56 06134 000005             5
57 06135 062677             IORST
58                          ADROUT
59 06136 030101             LDA     2,RECADR        ;ADDRESS CORRECT
60 06137 071034             DOA     2,MUX           ;BOARD
```

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 0083  PSID
01 06140 020365          LDA     0,SY026
02 06141 063034          DOC     0,MUX
03 06142 151400          INC     2,2
04 06143 071034          DOA     2,MUX
05 06144 063034          DOC     0,MUX
06                                                ;SYNC WORD= 010110
07                                                ;XMIT WORD=01/010101
08                                                ;SHOULD GET 0 AS 7TH BIT
09                                                ;(BECAUSE OF UNDERRUN)
10                       TRANSMIT        LOOPBACK,NOPARITY,CODE6
11 06145 006155          JSR@    ITRMT
12 06146 100011 100000+LOOPBACK+NOPARITY+CODE6
13                       XCLK    C1
14 06147 020235          LDA     0,C1
15 06150 006123          JSR     @.STEP
16                       MUXCLKA C1
17 06151 020235          LDA     0,C1
18 06152 006121          JSR     @ICONT
19 06153 024302          LDA     1,C125
20 06154 066034          DOB     1,MUX
21                       XCLK    C1
22 06155 020235          LDA     0,C1
23 06156 006123          JSR     @.STEP
24                       MUXCLKA C5
25 06157 020241          LDA     0,C5
26 06160 006121          JSR     @ICONT
27                       XCLK    C9.
28 06161 020245          LDA     0,C9.
29 06162 006123          JSR     @.STEP
30                       MUXCLKA C1
31 06163 020235          LDA     0,C1
32 06164 006121          JSR     @ICONT
33                       XCLK    C3
34 06165 020237          LDA     0,C3
35 06166 006123          JSR     @.STEP
36                       MUXCLKA C5
37 06167 020241          LDA     0,C5
38 06170 006121          JSR     @ICONT
39                       CHECK   SZR             ;SHOULD BE SYNC WORD
40 06171 060434          DIA     0,MUX
41 06172 062434          DIC     0,MUX
42 06173 024072          LDA     1,XMSK
43 06174 123414          AND#    1,0,SZR
44                       EHALT                   ;CODE LEVEL DECODER, LOAD
45 06175 006230          JSR@    IERR?
46 06176 006231          LOOPX                   ;SHIFT REGISTER
47
48                                                ;CHECK 7 LEVEL CODE XMIT
49 06177 006226 TR70:    JSR@    IENT?           ;SYNC=010110
50 06200 000005          5
51 06201 062677          IORST
52                                                ;TRANSMIT WORD=1/0101010
53                       TRANSMIT        LOOPBACK,NOPARITY,CODE7
54 06202 006155          JSR@    ITRMT
55 06203 100021 100000+LOOPBACK+NOPARITY+CODE7
56                       XCLK    C1
57 06204 020235          LDA     0,C1
58 06205 006123          JSR     @.STEP
59                       MUXCLKA C1
60 06206 020235          LDA     0,C1
```

```
 0084  PSID
01 06207 006121          JSR      @ICONT
02 06210 024314          LDA      1,C252
03 06211 066034          DOB      1,MUX
04                       XCLK     C1
05 06212 020235          LDA      0,C1
06 06213 006123          JSR      @.STEP
07                       MUXCLKA  C5
08 06214 020241          LDA      0,C5
09 06215 006121          JSR      @ICONT
10                       XCLK     C11.
11 06216 020247          LDA      0,C11.
12 06217 006123          JSR      @.STEP
13                       MUXCLKA  C1
14 06220 020235          LDA      0,C1
15 06221 006121          JSR      @ICONT
16                       XCLK     C3
17 06222 020237          LDA      0,C3
18 06223 006123          JSR      @.STEP
19                       MUXCLKA  C5
20 06224 020241          LDA      0,C5
21 06225 006121          JSR      @ICONT
22                       CHECK    SZR
23 06226 060434          DIA      0,MUX
24 06227 062434          DIC      0,MUX
25 06230 024072          LDA      1,XMSK
26 06231 123414          AND#     1,0,SZR
27                       EHALT                    ;CODE LEVEL DECODER, LOAD
28 06232 006230          JSR@     IERR?
29 06233 006231          LOOPX                    ;SHIFT REGISTER
```

```
!0085  PSID
01                ;CHECK RECEIVER
02
03 06234 006226 R001:   JSR@    IENT?            ;CHECK RESET TO SHIFTER
04 06235 000005         5
05 06236 062677         IORST
06                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
07 06237 006155         JSR@    ITRMT
08 06240 100031 100000+LOOPBACK+NOPARITY+CODE8
09                      XCLK    C1
10 06241 020235         LDA     0,C1
11 06242 006123         JSR     @.STEP
12                      RECEIVER
13 06243 020101         LDA     0,RECADR
14 06244 061034         DOA     0,MUX            ;ENABLE RECEIVER
15 06245 126520         SUBZL   1,1
16 06246 067034         DOC     1,MUX            ;START RECEIVER
17 06247 060434         DIA     0,MUX
18 06250 061434         DIB     0,MUX
19 06251 101004         MOV     0,0,SZR
20                      EHALT                    ;RESET TO SHIFTER, DIB SEL
21 06252 006230         JSR@    IERR?
22 06253 006231         LOOPX                    ;LOGIC
23
24                                               ;TRANSMIT ALTERNATE ONES, ZEROS
25                                               ;(8 LEVEL CODE) AND CHECK
26                                               ;RECEIVE DATA ONE
27                R002:   RCVBIT  1,C200,8.,C125   ;BIT AT A TIME
28 06254 006226         JSR@    IENT?
29 06255 000005         5
30 06256 062677         IORST
31                      TRANSMIT        LOOPBACK,NOPARITY,CODE8.
32 06257 006155         JSR@    ITRMT
33 06260 100031 100000+LOOPBACK+NOPARITY+CODE8.
34                      XCLK    C1
35 06261 020235         LDA     0,C1
36 06262 006123         JSR     @.STEP
37                      RECEIVER
38 06263 020101         LDA     0,RECADR
39 06264 061034         DOA     0,MUX            ;ENABLE RECEIVER
40 06265 126520         SUBZL   1,1
41 06266 067034         DOC     1,MUX            ;START RECEIVER
42                      MUXCLKA C1
43 06267 020235         LDA     0,C1
44 06270 006121         JSR     @ICONT
45 06271 024302         LDA     1,C125
46 06272 066034         DOB     1,MUX
47                      XCLK    C1
48 06273 020235         LDA     0,C1
49 06274 006123         JSR     @.STEP
50                      MUXCLKA C5
51 06275 020241         LDA     0,C5
52 06276 006121         JSR     @ICONT
53                      XCLK    C1
54 06277 020235         LDA     0,C1
55 06300 006123         JSR     @.STEP
56 06301 060434         DIA     0,MUX
57 06302 061434         DIB     0,MUX
58 06303 024307         LDA     1,C200
59 06304 122414         SUB#    1,0,SZR
60                      EHALT                    ;BIT 1 OF SHIFTER,
```

```
 0086  PSID
01 06305 006230          JSR@    IERR?
02 06306 006231          LOOPX                   ;DIB O.C. GATES
03                                               ;RON LOGIC, ICLK TO RCLK,
04                                               ;LOOPBACK,ONLINE
05               R003:   RCVBIT  3,C100,8.,C125
06 06307 006226          JSR@    IENT?
07 06310 000005          5
08 06311 062677          IORST
09                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
10 06312 006155          JSR@    ITRMT
11 06313 100031 100000+LOOPBACK+NOPARITY+CODE8.
12                       XCLK    C1
13 06314 020235          LDA     0,C1
14 06315 006123          JSR     @.STEP
15                       RECEIVER
16 06316 020101          LDA     0,RECADR
17 06317 061034          DOA     0,MUX           ;ENABLE RECEIVER
18 06320 126520          SUBZL   1,1
19 06321 067034          DOC     1,MUX           ;START RECEIVER
20                       MUXCLKA C1
21 06322 020235          LDA     0,C1
22 06323 006121          JSR     @ICONT
23 06324 024302          LDA     1,C125
24 06325 066034          DOB     1,MUX
25                       XCLK    C1
26 06326 020235          LDA     0,C1
27 06327 006123          JSR     @.STEP
28                       MUXCLKA C5
29 06330 020241          LDA     0,C5
30 06331 006121          JSR     @ICONT
31                       XCLK    C3
32 06332 020237          LDA     0,C3
33 06333 006123          JSR     @.STEP
34 06334 060434          DIA     0,MUX
35 06335 061434          DIB     0,MUX
36 06336 024277          LDA     1,C100
37 06337 122414          SUB#    1,0,SZR
38                       EHALT                   ;BIT 3 OF SHIFTER,
39 06340 006230          JSR@    IERR?
40 06341 006231          LOOPX                   ;DIB O.C. GATES
41                                               ;RESET TO SHIFT REGISTER
42                                               ;XDAT TO RDAT (COULD BE
43                                               ;FLOATING), LOOPBACK
44
45               R004:   RCVBIT  5,C240,8.,C125
46 06342 006226          JSR@    IENT?
47 06343 000005          5
48 06344 062677          IORST
49                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
50 06345 006155          JSR@    ITRMT
51 06346 100031 100000+LOOPBACK+NOPARITY+CODE8.
52                       XCLK    C1
53 06347 020235          LDA     0,C1
54 06350 006123          JSR     @.STEP
55                       RECEIVER
56 06351 020101          LDA     0,RECADR
57 06352 061034          DOA     0,MUX           ;ENABLE RECEIVER
58 06353 126520          SUBZL   1,1
59 06354 067034          DOC     1,MUX           ;START RECEIVER
60                       MUXCLKA C1
```

```
 0087  PSID
01 06355 020235          LDA     0,C1
02 06356 006121          JSR     @ICONT
03 06357 024302          LDA     1,C125
04 06360 066034          DOB     1,MUX
05                       XCLK    C1
06 06361 020235          LDA     0,C1
07 06362 006123          JSR     @.STEP
08                       MUXCLKA C5
09 06363 020241          LDA     0,C5
10 06364 006121          JSR     @ICONT
11                       XCLK    C5
12 06365 020241          LDA     0,C5
13 06366 006123          JSR     @.STEP
14 06367 060434          DIA     0,MUX
15 06370 061434          DIB     0,MUX
16 06371 024312          LDA     1,C240
17 06372 122414          SUB#    1,0,SZR
18                       EHALT                           ;BIT 5 OF SHIFTER,
19 06373 006230          JSR@    IERR?
20 06374 006231          LOOPX                           ;DIB O.C. GATES
21
22               R005:   RCVBIT  7,C120,8.,C125
23 06375 006226          JSR@    IENT?
24 06376 000005          5
25 06377 062677          IORST
26                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
27 06400 006155          JSR@    ITRMT
28 06401 100031 100000+LOOPBACK+NOPARITY+CODE8.
29                       XCLK    C1
30 06402 020235          LDA     0,C1
31 06403 006123          JSR     @.STEP
32                       RECEIVER
33 06404 020101          LDA     0,RECADR
34 06405 061034          DOA     0,MUX                   ;ENABLE RECEIVER
35 06406 126520          SUBZL   1,1
36 06407 067034          DOC     1,MUX                   ;START RECEIVER
37                       MUXCLKA C1
38 06410 020235          LDA     0,C1
39 06411 006121          JSR     @ICONT
40 06412 024302          LDA     1,C125
41 06413 066034          DOB     1,MUX
42                       XCLK    C1
43 06414 020235          LDA     0,C1
44 06415 006123          JSR     @.STEP
45                       MUXCLKA C5
46 06416 020241          LDA     0,C5
47 06417 006121          JSR     @ICONT
48                       XCLK    C7
49 06420 020243          LDA     0,C7
50 06421 006123          JSR     @.STEP
51 06422 060434          DIA     0,MUX
52 06423 061434          DIB     0,MUX
53 06424 024300          LDA     1,C120
54 06425 122414          SUB#    1,0,SZR
55                       EHALT                           ;BIT 7 OF SHIFTER,
56 06426 006230          JSR@    IERR?
57 06427 006231          LOOPX                           ;DIB O.C. GATES
58
59               R006:   RCVBIT  9.,C250,8.,C125
60 06430 006226          JSR@    IENT?
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 0088  PSID
01 06431 000005          5
02 06432 062677          IORST
03                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
04 06433 006155          JSR@    ITRMT
05 06434 100031 100000+LOOPBACK+NOPARITY+CODE8.
06                       XCLK    C1
07 06435 020235          LDA     0,C1
08 06436 006123          JSR     @.STEP
09                       RECEIVER
10 06437 020101          LDA     0,RECADR
11 06440 061034          DOA     0,MUX           ;ENABLE RECEIVER
12 06441 126520          SUBZL   1,1
13 06442 067034          DOC     1,MUX           ;START RECEIVER
14                       MUXCLKA C1
15 06443 020235          LDA     0,C1
16 06444 006121          JSR     @ICONT
17 06445 024302          LDA     1,C125
18 06446 066034          DOB     1,MUX
19                       XCLK    C1
20 06447 020235          LDA     0,C1
21 06450 006123          JSR     @.STEP
22                       MUXCLKA C5
23 06451 020241          LDA     0,C5
24 06452 006121          JSR     @ICONT
25                       XCLK    C9.
26 06453 020245          LDA     0,C9.
27 06454 006123          JSR     @.STEP
28 06455 060434          DIA     0,MUX
29 06456 061434          DIB     0,MUX
30 06457 024313          LDA     1,C250
31 06460 122414          SUB#    1,0,SZR
32                       EHALT                   ;BIT 9. OF SHIFTER,
33 06461 006230          JSR@    IERR?
34 06462 006231          LOOPX                   ;DIB O.C. GATES
35
36              R007:    RCVBIT  11.,C124,8.,C125
37 06463 006226          JSR@    IENT?
38 06464 000005          5
39 06465 062677          IORST
40                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
41 06466 006155          JSR@    ITRMT
42 06467 100031 100000+LOOPBACK+NOPARITY+CODE8.
43                       XCLK    C1
44 06470 020235          LDA     0,C1
45 06471 006123          JSR     @.STEP
46                       RECEIVER
47 06472 020101          LDA     0,RECADR
48 06473 061034          DOA     0,MUX           ;ENABLE RECEIVER
49 06474 126520          SUBZL   1,1
50 06475 067034          DOC     1,MUX           ;START RECEIVER
51                       MUXCLKA C1
52 06476 020235          LDA     0,C1
53 06477 006121          JSR     @ICONT
54 06500 024302          LDA     1,C125
55 06501 066034          DOB     1,MUX
56                       XCLK    C1
57 06502 020235          LDA     0,C1
58 06503 006123          JSR     @.STEP
59                       MUXCLKA C5
60 06504 020241          LDA     0,C5
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 0089  PSID
01 06505 006121          JSR     @ICONT
02                       XCLK    C11.
03 06506 020247          LDA     0,C11.
04 06507 006123          JSR     @.STEP
05 06510 060434          DIA     0,MUX
06 06511 061434          DIB     0,MUX
07 06512 024301          LDA     1,C124
08 06513 122414          SUB#    1,0,SZR
09                       EHALT                       ;BIT 11. OF SHIFTER,
10 06514 006230          JSR@    IERR?
11 06515 006231          LOOPX                       ;DIB O.C. GATES
12
13               R008:   RCVBIT  13.,C252,8.,C125
14 06516 006226          JSR@    IENT?
15 06517 000005          5
16 06520 062677          IORST
17                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
18 06521 006155          JSR@    ITRMT
19 06522 100031 100000+LOOPBACK+NOPARITY+CODE8.
20                       XCLK    C1
21 06523 020235          LDA     0,C1
22 06524 006123          JSR     @.STEP
23                       RECEIVER
24 06525 020101          LDA     0,RECADR
25 06526 061034          DOA     0,MUX               ;ENABLE RECEIVER
26 06527 126520          SUBZL   1,1
27 06530 067034          DOC     1,MUX               ;START RECEIVER
28                       MUXCLKA C1
29 06531 020235          LDA     0,C1
30 06532 006121          JSR     @ICONT
31 06533 024302          LDA     1,C125
32 06534 066034          DOB     1,MUX
33                       XCLK    C1
34 06535 020235          LDA     0,C1
35 06536 006123          JSR     @.STEP
36                       MUXCLKA C5
37 06537 020241          LDA     0,C5
38 06540 006121          JSR     @ICONT
39                       XCLK    C13.
40 06541 020251          LDA     0,C13.
41 06542 006123          JSR     @.STEP
42 06543 060434          DIA     0,MUX
43 06544 061434          DIB     0,MUX
44 06545 024314          LDA     1,C252
45 06546 122414          SUB#    1,0,SZR
46                       EHALT                       ;BIT 13. OF SHIFTER,
47 06547 006230          JSR@    IERR?
48 06550 006231          LOOPX                       ;DIB O.C. GATES
49
50               R009:   RCVBIT  15.,C125,8.,C125
51 06551 006226          JSR@    IENT?
52 06552 000005          5
53 06553 062677          IORST
54                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
55 06554 006155          JSR@    ITRMT
56 06555 100031 100000+LOOPBACK+NOPARITY+CODE8.
57                       XCLK    C1
58 06556 020235          LDA     0,C1
59 06557 006123          JSR     @.STEP
60                       RECEIVER
```

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 0090  PSID
01 06560 020101          LDA     0,RECADR
02 06561 061034          DOA     0,MUX           ;ENABLE RECEIVER
03 06562 126520          SUBZL   1,1
04 06563 067034          DOC     1,MUX           ;START RECEIVER
05                       MUXCLKA C1
06 06564 020235          LDA     0,C1
07 06565 006121          JSR     @ICONT
08 06566 024302          LDA     1,C125
09 06567 066034          DOB     1,MUX
10                       XCLK    C1
11 06570 020235          LDA     0,C1
12 06571 006123          JSR     @.STEP
13                       MUXCLKA C5
14 06572 020241          LDA     0,C5
15 06573 006121          JSR     @ICONT
16                       XCLK    C15.
17 06574 020253          LDA     0,C15.
18 06575 006123          JSR     @.STEP
19 06576 060434          DIA     0,MUX
20 06577 061434          DIB     0,MUX
21 06600 024302          LDA     1,C125
22 06601 122414          SUB#    1,0,SZR
23                       EHALT                   ;BIT 15. OF SHIFTER,
24 06602 006230          JSR@    IERR?
25 06603 006231          LOOPX                   ;DIB O.C. GATES
26
27                                               ;XMIT ALTERNATING ZEROS, ONES
28                                               ;DOWN SHIFTER AND REPEAT
29               R010:   RCVBIT  1,C0,8.,C252    ;PREVIOUS TESTS
30 06604 006226          JSR@    IENT?
31 06605 000005          5
32 06606 062677          IORST
33                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
34 06607 006155          JSR@    ITRMT
35 06610 100031 100000+LOOPBACK+NOPARITY+CODE8.
36                       XCLK    C1
37 06611 020235          LDA     0,C1
38 06612 006123          JSR     @.STEP
39                       RECEIVER
40 06613 020101          LDA     0,RECADR
41 06614 061034          DOA     0,MUX           ;ENABLE RECEIVER
42 06615 126520          SUBZL   1,1
43 06616 067034          DOC     1,MUX           ;START RECEIVER
44                       MUXCLKA C1
45 06617 020235          LDA     0,C1
46 06620 006121          JSR     @ICONT
47 06621 024314          LDA     1,C252
48 06622 066034          DOB     1,MUX
49                       XCLK    C1
50 06623 020235          LDA     0,C1
51 06624 006123          JSR     @.STEP
52                       MUXCLKA C5
53 06625 020241          LDA     0,C5
54 06626 006121          JSR     @ICONT
55                       XCLK    C1
56 06627 020235          LDA     0,C1
57 06630 006123          JSR     @.STEP
58 06631 060434          DIA     0,MUX
59 06632 061434          DIB     0,MUX
60 06633 024234          LDA     1,C0
```

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 0091  PSID
01 06634 122414          SUB#    1,0,SZR
02                       EHALT                   ;BIT 1 OF SHIFTER,
03 06635 006230          JSR@    IERR?
04 06636 006231          LOOPX                   ;DIB O.C. GATES
05
06               R011:   RCVBIT  3,C200,8.,C252
07 06637 006226          JSR@    IENT?
08 06640 000005          5
09 06641 062677          IORST
10                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
11 06642 006155          JSR@    ITRMT
12 06643 100031 100000+LOOPBACK+NOPARITY+CODE8.
13                       XCLK    C1
14 06644 020235          LDA     0,C1
15 06645 006123          JSR     @.STEP
16                       RECEIVER
17 06646 020101          LDA     0,RECADR
18 06647 061034          DOA     0,MUX           ;ENABLE RECEIVER
19 06650 126520          SUBZL   1,1
20 06651 067034          DOC     1,MUX           ;START RECEIVER
21                       MUXCLKA C1
22 06652 020235          LDA     0,C1
23 06653 006121          JSR     @ICONT
24 06654 024314          LDA     1,C252
25 06655 066034          DOB     1,MUX
26                       XCLK    C1
27 06656 020235          LDA     0,C1
28 06657 006123          JSR     @.STEP
29                       MUXCLKA C5
30 06660 020241          LDA     0,C5
31 06661 006121          JSR     @ICONT
32                       XCLK    C3
33 06662 020237          LDA     0,C3
34 06663 006123          JSR     @.STEP
35 06664 060434          DIA     0,MUX
36 06665 061434          DIB     0,MUX
37 06666 024307          LDA     1,C200
38 06667 122414          SUB#    1,0,SZR
39                       EHALT                   ;BIT 3 OF SHIFTER,
40 06670 006230          JSR@    IERR?
41 06671 006231          LOOPX                   ;DIB O.C. GATES
42
43               R012:   RCVBIT  5,C100,8.,C252
44 06672 006226          JSR@    IENT?
45 06673 000005          5
46 06674 062677          IORST
47                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
48 06675 006155          JSR@    ITRMT
49 06676 100031 100000+LOOPBACK+NOPARITY+CODE8.
50                       XCLK    C1
51 06677 020235          LDA     0,C1
52 06700 006123          JSR     @.STEP
53                       RECEIVER
54 06701 020101          LDA     0,RECADR
55 06702 061034          DOA     0,MUX           ;ENABLE RECEIVER
56 06703 126520          SUBZL   1,1
57 06704 067034          DOC     1,MUX           ;START RECEIVER
58                       MUXCLKA C1
59 06705 020235          LDA     0,C1
60 06706 006121          JSR     @ICONT
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 0092  PSID
01 06707 024314          LDA     1,C252
02 06710 066034          DOB     1,MUX
03                       XCLK    C1
04 06711 020235          LDA     0,C1
05 06712 006123          JSR     @.STEP
06                       MUXCLKA C5
07 06713 020241          LDA     0,C5
08 06714 006121          JSR     @ICONT
09                       XCLK    C5
10 06715 020241          LDA     0,C5
11 06716 006123          JSR     @.STEP
12 06717 060434          DIA     0,MUX
13 06720 061434          DIB     0,MUX
14 06721 024277          LDA     1,C100
15 06722 122414          SUB#    1,0,SZR
16                       EHALT                   ;BIT 5 OF SHIFTER,
17 06723 006230          JSR@    IERR?
18 06724 006231          LOOPX                   ;DIB O.C. GATES
19
20               R013:   RCVBIT  7,C240,8.,C252
21 06725 006226          JSR@    IENT?
22 06726 000005          5
23 06727 062677          IORST
24                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
25 06730 006155          JSR@    ITRMT
26 06731 100031 100000+LOOPBACK+NOPARITY+CODE8.
27                       XCLK    C1
28 06732 020235          LDA     0,C1
29 06733 006123          JSR     @.STEP
30                       RECEIVER
31 06734 020101          LDA     0,RECADR
32 06735 061034          DOA     0,MUX           ;ENABLE RECEIVER
33 06736 126520          SUBZL   1,1
34 06737 067034          DOC     1,MUX           ;START RECEIVER
35                       MUXCLKA C1
36 06740 020235          LDA     0,C1
37 06741 006121          JSR     @ICONT
38 06742 024314          LDA     1,C252
39 06743 066034          DOB     1,MUX
40                       XCLK    C1
41 06744 020235          LDA     0,C1
42 06745 006123          JSR     @.STEP
43                       MUXCLKA C5
44 06746 020241          LDA     0,C5
45 06747 006121          JSR     @ICONT
46                       XCLK    C7
47 06750 020243          LDA     0,C7
48 06751 006123          JSR     @.STEP
49 06752 060434          DIA     0,MUX
50 06753 061434          DIB     0,MUX
51 06754 024312          LDA     1,C240
52 06755 122414          SUB#    1,0,SZR
53                       EHALT                   ;BIT 7 OF SHIFTER,
54 06756 006230          JSR@    IERR?
55 06757 006231          LOOPX                   ;DIB O.C. GATES
56
57               R014:   RCVBIT  9.,C120,8.,C252
58 06760 006226          JSR@    IENT?
59 06761 000005          5
60 06762 062677          IORST
```

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 0093  PSID
01                      TRANSMIT        LOOPBACK,NOPARITY,CODE8.
02 06763 006155         JSR@    ITRMT
03 06764 100031 100000+LOOPBACK+NOPARITY+CODE8.
04                      XCLK    C1
05 06765 020235         LDA     0,C1
06 06766 006123         JSR     @.STEP
07                      RECEIVER
08 06767 020101         LDA     0,RECADR
09 06770 061034         DOA     0,MUX           ;ENABLE RECEIVER
10 06771 126520         SUBZL   1,1
11 06772 067034         DOC     1,MUX           ;START RECEIVER
12                      MUXCLKA C1
13 06773 020235         LDA     0,C1
14 06774 006121         JSR     @ICONT
15 06775 024314         LDA     1,C252
16 06776 066034         DOB     1,MUX
17                      XCLK    C1
18 06777 020235         LDA     0,C1
19 07000 006123         JSR     @.STEP
20                      MUXCLKA C5
21 07001 020241         LDA     0,C5
22 07002 006121         JSR     @ICONT
23                      XCLK    C9.
24 07003 020245         LDA     0,C9.
25 07004 006123         JSR     @.STEP
26 07005 060434         DIA     0,MUX
27 07006 061434         DIB     0,MUX
28 07007 024300         LDA     1,C120
29 07010 122414         SUB#    1,0,SZR
30                      EHALT                   ;BIT 9. OF SHIFTER,
31 07011 006230         JSR@    IERR?
32 07012 006231         LOOPX                   ;DIB O.C. GATES
33
34              R015:   RCVBIT  11.,C250,8.,C252
35 07013 006226         JSR@    IENT?
36 07014 000005         5
37 07015 062677         IORST
38                      TRANSMIT        LOOPBACK,NOPARITY,CODE8.
39 07016 006155         JSR@    ITRMT
40 07017 100031 100000+LOOPBACK+NOPARITY+CODE8.
41                      XCLK    C1
42 07020 020235         LDA     0,C1
43 07021 006123         JSR     @.STEP
44                      RECEIVER
45 07022 020101         LDA     0,RECADR
46 07023 061034         DOA     0,MUX           ;ENABLE RECEIVER
47 07024 126520         SUBZL   1,1
48 07025 067034         DOC     1,MUX           ;START RECEIVER
49                      MUXCLKA C1
50 07026 020235         LDA     0,C1
51 07027 006121         JSR     @ICONT
52 07030 024314         LDA     1,C252
53 07031 066034         DOB     1,MUX
54                      XCLK    C1
55 07032 020235         LDA     0,C1
56 07033 006123         JSR     @.STEP
57                      MUXCLKA C5
58 07034 020241         LDA     0,C5
59 07035 006121         JSR     @ICONT
60                      XCLK    C11.
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 0094  PSID
01 07036 020247          LDA     0,C11.
02 07037 006123          JSR     @.STEP
03 07040 060434          DIA     0,MUX
04 07041 061434          DIB     0,MUX
05 07042 024313          LDA     1,C250
06 07043 122414          SUB#    1,0,SZR
07                       EHALT                   ;BIT 11. OF SHIFTER,
08 07044 006230          JSR@    IERR?
09 07045 006231          LOOPX                   ;DIB O.C. GATES
10
11               R016:   RCVBIT  13.,C124,8.,C252
12 07046 006226          JSR@    IENT?
13 07047 000005          5
14 07050 062677          IORST
15                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
16 07051 006155          JSR@    ITRMT
17 07052 100031 100000+LOOPBACK+NOPARITY+CODE8.
18                       XCLK    C1
19 07053 020235          LDA     0,C1
20 07054 006123          JSR     @.STEP
21                       RECEIVER
22 07055 020101          LDA     0,RECADR
23 07056 061034          DOA     0,MUX           ;ENABLE RECEIVER
24 07057 126520          SUBZL   1,1
25 07060 067034          DOC     1,MUX           ;START RECEIVER
26                       MUXCLKA C1
27 07061 020235          LDA     0,C1
28 07062 006121          JSR     @ICONT
29 07063 024314          LDA     1,C252
30 07064 066034          DOB     1,MUX
31                       XCLK    C1
32 07065 020235          LDA     0,C1
33 07066 006123          JSR     @.STEP
34                       MUXCLKA C5
35 07067 020241          LDA     0,C5
36 07070 006121          JSR     @ICONT
37                       XCLK    C13.
38 07071 020251          LDA     0,C13.
39 07072 006123          JSR     @.STEP
40 07073 060434          DIA     0,MUX
41 07074 061434          DIB     0,MUX
42 07075 024301          LDA     1,C124
43 07076 122414          SUB#    1,0,SZR
44                       EHALT                   ;BIT 13. OF SHIFTER,
45 07077 006230          JSR@    IERR?
46 07100 006231          LOOPX                   ;DIB O.C. GATES
47
48               R017:   RCVBIT  15.,C252,8.,C252
49 07101 006226          JSR@    IENT?
50 07102 000005          5
51 07103 062677          IORST
52                       TRANSMIT        LOOPBACK,NOPARITY,CODE8.
53 07104 006155          JSR@    ITRMT
54 07105 100031 100000+LOOPBACK+NOPARITY+CODE8.
55                       XCLK    C1
56 07106 020235          LDA     0,C1
57 07107 006123          JSR     @.STEP
58                       RECEIVER
59 07110 020101          LDA     0,RECADR
60 07111 061034          DOA     0,MUX           ;ENABLE RECEIVER
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 0095  PSID
01 07112 126520          SUBZL   1,1
02 07113 067034          DOC     1,MUX           ;START RECEIVER
03                       MUXCLKA C1
04 07114 020235          LDA     0,C1
05 07115 006121          JSR     @ICONT
06 07116 024314          LDA     1,C252
07 07117 066034          DOB     1,MUX
08                       XCLK    C1
09 07120 020235          LDA     0,C1
10 07121 006123          JSR     @.STEP
11                       MUXCLKA C5
12 07122 020241          LDA     0,C5
13 07123 006121          JSR     @ICONT
14                       XCLK    C15.
15 07124 020253          LDA     0,C15.
16 07125 006123          JSR     @.STEP
17 07126 060434          DIA     0,MUX
18 07127 061434          DIB     0,MUX
19 07130 024314          LDA     1,C252
20 07131 122414          SUB#    1,0,SZR
21                       EHALT                   ;BIT 15. OF SHIFTER,
22 07132 006230          JSR@    IERR?
23 07133 006231          LOOPX                   ;DIB O.C. GATES
24
25              R018:    RCVBIT  1,C0,7,C377     ;CHECK 7 LEVEL CODE BLOCKING
26 07134 006226          JSR@    IENT?
27 07135 000005          5
28 07136 062677          IORST
29                       TRANSMIT        LOOPBACK,NOPARITY,CODE7
30 07137 006155          JSR@    ITRMT
31 07140 100021 100000+LOOPBACK+NOPARITY+CODE7
32                       XCLK    C1
33 07141 020235          LDA     0,C1
34 07142 006123          JSR     @.STEP
35                       RECEIVER
36 07143 020101          LDA     0,RECADR
37 07144 061034          DOA     0,MUX           ;ENABLE RECEIVER
38 07145 126520          SUBZL   1,1
39 07146 067034          DOC     1,MUX           ;START RECEIVER
40                       MUXCLKA C1
41 07147 020235          LDA     0,C1
42 07150 006121          JSR     @ICONT
43 07151 024326          LDA     1,C377
44 07152 066034          DOB     1,MUX
45                       XCLK    C1
46 07153 020235          LDA     0,C1
47 07154 006123          JSR     @.STEP
48                       MUXCLKA C5
49 07155 020241          LDA     0,C5
50 07156 006121          JSR     @ICONT
51                       XCLK    C1
52 07157 020235          LDA     0,C1
53 07160 006123          JSR     @.STEP
54 07161 060434          DIA     0,MUX
55 07162 061434          DIB     0,MUX
56 07163 024234          LDA     1,C0
57 07164 122414          SUB#    1,0,SZR
58                       EHALT                   ;BIT 1 OF SHIFTER,
59 07165 006230          JSR@    IERR?
60 07166 006231          LOOPX                   ;DIB O.C. GATES
```

```
 0096  PSID
01                                                  ;LEN1, LEN2 OPEN
02              R019:   RCVBIT  3,C100,7,C377
03 07167 006226         JSR@    IENT?
04 07170 000005         5
05 07171 062677         IORST
06                      TRANSMIT        LOOPBACK,NOPARITY,CODE7
07 07172 006155         JSR@    ITRMT
08 07173 100021 100000+LOOPBACK+NOPARITY+CODE7
09                      XCLK    C1
10 07174 020235         LDA     0,C1
11 07175 006123         JSR     @.STEP
12                      RECEIVER
13 07176 020101         LDA     0,RECADR
14 07177 061034         DOA     0,MUX           ;ENABLE RECEIVER
15 07200 126520         SUBZL   1,1
16 07201 067034         DOC     1,MUX           ;START RECEIVER
17                      MUXCLKA C1
18 07202 020235         LDA     0,C1
19 07203 006121         JSR     @ICONT
20 07204 024326         LDA     1,C377
21 07205 066034         DOB     1,MUX
22                      XCLK    C1
23 07206 020235         LDA     0,C1
24 07207 006123         JSR     @.STEP
25                      MUXCLKA C5
26 07210 020241         LDA     0,C5
27 07211 006121         JSR     @ICONT
28                      XCLK    C3
29 07212 020237         LDA     0,C3
30 07213 006123         JSR     @.STEP
31 07214 060434         DIA     0,MUX
32 07215 061434         DIB     0,MUX
33 07216 024277         LDA     1,C100
34 07217 122414         SUB#    1,0,SZR
35                      EHALT                   ;BIT 3 OF SHIFTER,
36 07220 006230         JSR@    IERR?
37 07221 006231         LOOPX                   ;DIB O.C. GATES
38
39              R020:   RCVBIT  5,C140,7,C377
40 07222 006226         JSR@    IENT?
41 07223 000005         5
42 07224 062677         IORST
43                      TRANSMIT        LOOPBACK,NOPARITY,CODE7
44 07225 006155         JSR@    ITRMT
45 07226 100021 100000+LOOPBACK+NOPARITY+CODE7
46                      XCLK    C1
47 07227 020235         LDA     0,C1
48 07230 006123         JSR     @.STEP
49                      RECEIVER
50 07231 020101         LDA     0,RECADR
51 07232 061034         DOA     0,MUX           ;ENABLE RECEIVER
52 07233 126520         SUBZL   1,1
53 07234 067034         DOC     1,MUX           ;START RECEIVER
54                      MUXCLKA C1
55 07235 020235         LDA     0,C1
56 07236 006121         JSR     @ICONT
57 07237 024326         LDA     1,C377
58 07240 066034         DOB     1,MUX
59                      XCLK    C1
60 07241 020235         LDA     0,C1
```

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 0097  PSID
01 07242 006123          JSR     @.STEP
02                       MUXCLKA C5
03 07243 020241          LDA     0,C5
04 07244 006121          JSR     @ICONT
05                       XCLK    C5
06 07245 020241          LDA     0,C5
07 07246 006123          JSR     @.STEP
08 07247 060434          DIA     0,MUX
09 07250 061434          DIB     0,MUX
10 07251 024304          LDA     1,C140
11 07252 122414          SUB#    1,0,SZR
12                       EHALT                   ;BIT 5 OF SHIFTER,
13 07253 006230          JSR@    IERR?
14 07254 006231          LOOPX                   ;DIB O.C. GATES
15               R021:   RCVBIT  1,C0,6,C377     ;CHECK 6 LEVEL CODE BLOCKING
16 07255 006226          JSR@    IENT?
17 07256 000005          5
18 07257 062677          IORST
19                       TRANSMIT        LOOPBACK,NOPARITY,CODE6
20 07260 006155          JSR@    ITRMT
21 07261 100011 100000+LOOPBACK+NOPARITY+CODE6
22                       XCLK    C1
23 07262 020235          LDA     0,C1
24 07263 006123          JSR     @.STEP
25                       RECEIVER
26 07264 020101          LDA     0,RECADR
27 07265 061034          DOA     0,MUX           ;ENABLE RECEIVER
28 07266 126520          SUBZL   1,1
29 07267 067034          DOC     1,MUX           ;START RECEIVER
30                       MUXCLKA C1
31 07270 020235          LDA     0,C1
32 07271 006121          JSR     @ICONT
33 07272 024326          LDA     1,C377
34 07273 066034          DOB     1,MUX
35                       XCLK    C1
36 07274 020235          LDA     0,C1
37 07275 006123          JSR     @.STEP
38                       MUXCLKA C5
39 07276 020241          LDA     0,C5
40 07277 006121          JSR     @ICONT
41                       XCLK    C1
42 07300 020235          LDA     0,C1
43 07301 006123          JSR     @.STEP
44 07302 060434          DIA     0,MUX
45 07303 061434          DIB     0,MUX
46 07304 024234          LDA     1,C0
47 07305 122414          SUB#    1,0,SZR
48                       EHALT                   ;BIT 1 OF SHIFTER,
49 07306 006230          JSR@    IERR?
50 07307 006231          LOOPX                   ;DIB O.C. GATES
51
52               R022:   RCVBIT  2,C0,6,C377
53 07310 006226          JSR@    IENT?
54 07311 000005          5
55 07312 062677          IORST
56                       TRANSMIT        LOOPBACK,NOPARITY,CODE6
57 07313 006155          JSR@    ITRMT
58 07314 100011 100000+LOOPBACK+NOPARITY+CODE6
59                       XCLK    C1
60 07315 020235          LDA     0,C1
```

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 0098  PSID
01 07316 006123          JSR     @.STEP
02                       RECEIVER
03 07317 020101          LDA     0,RECADR
04 07320 061034          DOA     0,MUX            ;ENABLE RECEIVER
05 07321 126520          SUBZL   1,1
06 07322 067034          DOC     1,MUX            ;START RECEIVER
07                       MUXCLKA C1
08 07323 020235          LDA     0,C1
09 07324 006121          JSR     @ICONT
10 07325 024326          LDA     1,C377
11 07326 066034          DOB     1,MUX
12                       XCLK    C1
13 07327 020235          LDA     0,C1
14 07330 006123          JSR     @.STEP
15                       MUXCLKA C5
16 07331 020241          LDA     0,C5
17 07332 006121          JSR     @ICONT
18                       XCLK    C2
19 07333 020236          LDA     0,C2
20 07334 006123          JSR     @.STEP
21 07335 060434          DIA     0,MUX
22 07336 061434          DIB     0,MUX
23 07337 024234          LDA     1,C0
24 07340 122414          SUB#    1,0,SZR
25                       EHALT                    ;BIT 2 OF SHIFTER,
26 07341 006230          JSR@    IERR?
27 07342 006231          LOOPX                    ;DIB O.C. GATES
28                                                ;LEN1 OPEN
29               R023:   RCVBIT  5,C40,6,C377
30 07343 006226          JSR@    IENT?
31 07344 000005          5
32 07345 062677          IORST
33                       TRANSMIT        LOOPBACK,NOPARITY,CODE6
34 07346 006155          JSR@    ITRMT
35 07347 100011 100000+LOOPBACK+NOPARITY+CODE6
36                       XCLK    C1
37 07350 020235          LDA     0,C1
38 07351 006123          JSR     @.STEP
39                       RECEIVER
40 07352 020101          LDA     0,RECADR
41 07353 061034          DOA     0,MUX            ;ENABLE RECEIVER
42 07354 126520          SUBZL   1,1
43 07355 067034          DOC     1,MUX            ;START RECEIVER
44                       MUXCLKA C1
45 07356 020235          LDA     0,C1
46 07357 006121          JSR     @ICONT
47 07360 024326          LDA     1,C377
48 07361 066034          DOB     1,MUX
49                       XCLK    C1
50 07362 020235          LDA     0,C1
51 07363 006123          JSR     @.STEP
52                       MUXCLKA C5
53 07364 020241          LDA     0,C5
54 07365 006121          JSR     @ICONT
55                       XCLK    C5
56 07366 020241          LDA     0,C5
57 07367 006123          JSR     @.STEP
58 07370 060434          DIA     0,MUX
59 07371 061434          DIB     0,MUX
60 07372 024272          LDA     1,C40
```

```
 0099  PSID
01 07373 122414          SUB#    1,0,SZR
02                       EHALT                   ;BIT 5 OF SHIFTER,
03 07374 006230          JSR@    IERR?
04 07375 006231          LOOPX                   ;DIB O.C. GATES
05
06               R024:   RCVBIT  7,C60,6,C377
07 07376 006226          JSR@    IENT?
08 07377 000005          5
09 07400 062677          IORST
10                       TRANSMIT        LOOPBACK,NOPARITY,CODE6
11 07401 006155          JSR@    ITRMT
12 07402 100011 100000+LOOPBACK+NOPARITY+CODE6
13                       XCLK    C1
14 07403 020235          LDA     0,C1
15 07404 006123          JSR     @.STEP
16                       RECEIVER
17 07405 020101          LDA     0,RECADR
18 07406 061034          DOA     0,MUX           ;ENABLE RECEIVER
19 07407 126520          SUBZL   1,1
20 07410 067034          DOC     1,MUX           ;START RECEIVER
21                       MUXCLKA C1
22 07411 020235          LDA     0,C1
23 07412 006121          JSR     @ICONT
24 07413 024326          LDA     1,C377
25 07414 066034          DOB     1,MUX
26                       XCLK    C1
27 07415 020235          LDA     0,C1
28 07416 006123          JSR     @.STEP
29                       MUXCLKA C5
30 07417 020241          LDA     0,C5
31 07420 006121          JSR     @ICONT
32                       XCLK    C7
33 07421 020243          LDA     0,C7
34 07422 006123          JSR     @.STEP
35 07423 060434          DIA     0,MUX
36 07424 061434          DIB     0,MUX
37 07425 024273          LDA     1,C60
38 07426 122414          SUB#    1,0,SZR
39                       EHALT                   ;BIT 7 OF SHIFTER,
40 07427 006230          JSR@    IERR?
41 07430 006231          LOOPX                   ;DIB O.C. GATES
42 07431 006226 R025:    JSR@    IENT?           ;TRANSMIT CHARACTER
43 07432 000005          5
44 07433 062677          IORST
45                       ADROUT                  ;SET UP NON-ZERO SYNC WORD
46 07434 030101          LDA     2,RECADR        ;ADDRESS CORRECT
47 07435 071034          DOA     2,MUX           ;BOARD
48 07436 024336          LDA     1,C40026
49 07437 067034          DOC     1,MUX
50 07440 151400          INC     2,2
51 07441 071034          DOA     2,MUX
52 07442 067034          DOC     1,MUX
53                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
54 07443 006155          JSR@    ITRMT
55 07444 100031 100000+LOOPBACK+NOPARITY+CODE8
56                       CHARA   125,8.
57 07445 006125          JSR@    ICHRA
58 07446 000125          125
59 07447 000036          4*8.-2
60 07450 000022          2*8.+2+(2*(8.-8.))
```

```
 0100  PSID
01 07451 060434          DIA     0,MUX
02 07452 101232          MOVZR#  0,0,SZC          ;DID RECEIVE SET DONE LAST?
03                       EHALT                    ;XMIT/RECV CLOCKS, SYNC WORD
04 07453 006230          JSR@    IERR?
05 07454 006231          LOOPX                    ;GENERATION, LINE CHARAC-
06                                                ;TERISTICS DECODING,TRANSMIT,
07                                                ;RECEIVE LOGIC
08                                                ;* *ALSO CHECK 12 V POWER
09                                                ; SUPPLY !* * *
10 07455 006226 R026:    JSR@    IENT?            ;CHECK ENTERING CHARMODE
11 07456 000005          5
12 07457 062677          IORST
13                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
14 07460 006155          JSR@    ITRMT
15 07461 100031 100000+LOOPBACK+NOPARITY+CODE8
16                       CHARA   125,8.
17 07462 006125          JSR@    ICHRA
18 07463 000125          125
19 07464 000036          4*8.-2
20 07465 000022          2*8.+2+(2*(8.-8.))
21 07466 060434          DIA     0;MUX
22 07467 061434          DIB     0,MUX
23 07470 024302          LDA     1,C125
24 07471 122414          SUB#    1,0,SZR
25                       EHALT                    ;RECEIVE DATA REGISTER,SHIFT
26 07472 006230          JSR@    IERR?
27 07473 006231          LOOPX                    ;REGISTER
28 07474 006226 R027:    JSR@    IENT?            ;NO CHARMODE W/O RSET
29 07475 000005          5
30 07476 062677          IORST
31                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
32 07477 006155          JSR@    ITRMT
33 07500 100031 100000+LOOPBACK+NOPARITY+CODE8
34                       XCLK    C1
35 07501 020235          LDA     0,C1
36 07502 006123          JSR     @.STEP
37                       RECEIVER
38 07503 020101          LDA     0,RECADR
39 07504 061034          DOA     0,MUX            ;ENABLE RECEIVER
40 07505 126520          SUBZL   1,1
41 07506 067034          DOC     1,MUX            ;START RECEIVER
42                       MUXCLKA C1
43 07507 020235          LDA     0,C1
44 07510 006121          JSR     @ICONT
45                       X.CLK   30.
46 07511 030363          LDA     2,CM30.
47                       XCLK    C1
48 07512 020235          LDA     0,C1
49 07513 006123          JSR     @.STEP
50                       MUXCLKA C5
51 07514 020241          LDA     0,C5
52 07515 006121          JSR     @ICONT
53 07516 151404          INC     2,2,SZR
54 07517 000773          JMP     .-5
55 07520 024302          LDA     1,C125
56 07521 066034          DOB     1,MUX
57                       X.CLK   17.
58 07522 030361          LDA     2,CM17.
59                       XCLK    C1
60 07523 020235          LDA     0,C1
```

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 0101  PSID
01 07524 006123          JSR     @.STEP
02                       MUXCLKA C5
03 07525 020241          LDA     0,C5
04 07526 006121          JSR     @ICONT
05 07527 151404          INC     2,2,SZR
06 07530 000773          JMP     .-5
07                       XCLK    C1
08 07531 020235          LDA     0,C1
09 07532 006123          JSR     @.STEP
10 07533 060434          DIA     0,MUX
11 07534 101233          MOVZR#  0,0,SNC
12                       EHALT                   ;RESET TO RCV-DN
13 07535 006230          JSR@    IERR?
14 07536 006231          LOOPX
15
16 07537 006226 R028:    JSR@    IENT?           ;CHECK BITMODE- OFFSET
17 07540 000005          5
18 07541 062677          IORST
19                                               ;SYNC TRANSMISSION WORD
20                                               ;AND CHECK FOR RECEIVE
21                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
22 07542 006155          JSR@    ITRMT
23 07543 100031 100000+LOOPBACK+NOPARITY+CODE8
24                       XCLK    C1
25 07544 020235          LDA     0,C1
26 07545 006123          JSR     @.STEP
27                       RECEIVER                ;WILL TRANSMIT
28 07546 020101          LDA     0,RECADR
29 07547 061034          DOA     0,MUX           ;ENABLE RECEIVER
30 07550 126520          SUBZL   1,1
31 07551 067034          DOC     1,MUX           ;START RECEIVER
32                       MUXCLKA C1              ;010/10101000/10110000/10110111
33 07552 020235          LDA     0,C1
34 07553 006121          JSR     @ICONT
35 07554 024316          LDA     1,C267          ;SYNC CHARACTER OFFSET 3 BITS
36 07555 066034          DOB     1,MUX
37                       X.CLK   14.
38 07556 030354          LDA     2,CM14.
39                       XCLK    C1
40 07557 020235          LDA     0,C1
41 07560 006123          JSR     @.STEP
42                       MUXCLKA C5
43 07561 020241          LDA     0,C5
44 07562 006121          JSR     @ICONT
45 07563 151404          INC     2,2,SZR
46 07564 000773          JMP     .-5
47 07565 024315          LDA     1,C260
48 07566 066034          DOB     1,MUX
49                       X.CLK   16.
50 07567 030355          LDA     2,CM16.
51                       XCLK    C1
52 07570 020235          LDA     0,C1
53 07571 006123          JSR     @.STEP
54                       MUXCLKA C5
55 07572 020241          LDA     0,C5
56 07573 006121          JSR     @ICONT
57 07574 151404          INC     2,2,SZR
58 07575 000773          JMP     .-5
59 07576 024313          LDA     1,C250
60 07577 066034          DOB     1,MUX
```

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 0102  PSID
01                          X.CLK   16.
02 07600 030355             LDA     2,CM16.
03                          XCLK    C1
04 07601 020235             LDA     0,C1
05 07602 006123             JSR     @.STEP
06                          MUXCLKA C5
07 07603 020241             LDA     0,C5
08 07604 006121             JSR     @ICONT
09 07605 151404             INC     2,2,SZR
10 07606 000773             JMP     .-5
11 07607 024236             LDA     1,C2
12 07610 066034             DOB     1,MUX
13                          X.CLK   8.
14 07611 030351             LDA     2,CM8.
15                          XCLK    C1
16 07612 020235             LDA     0,C1
17 07613 006123             JSR     @.STEP
18                          MUXCLKA C5
19 07614 020241             LDA     0,C5
20 07615 006121             JSR     @ICONT
21 07616 151404             INC     2,2,SZR
22 07617 000773             JMP     .-5
23 07620 060434             DIA     0,MUX
24 07621 101232             MOVZR#  0,0,SZC
25                          EHALT                       ;RECEIVE BITMODE
26 07622 006230             JSR@    IERR?
27 07623 006231             LOOPX
28 07624 006226 R029:       JSR@    IENT?               ;CHECK CHARACTER
29 07625 000005             5
30 07626 062677             IORST
31                          TRANSMIT        LOOPBACK,NOPARITY,CODE8
32 07627 006155             JSR@    ITRMT
33 07630 100031 100000+LOOPBACK+NOPARITY+CODE8
34                          XCLK    C1
35 07631 020235             LDA     0,C1
36 07632 006123             JSR     @.STEP
37                          RECEIVER
38 07633 020101             LDA     0,RECADR
39 07634 061034             DOA     0,MUX               ;ENABLE RECEIVER
40 07635 126520             SUBZL   1,1
41 07636 067034             DOC     1,MUX               ;START RECEIVER
42                          MUXCLKA C1
43 07637 020235             LDA     0,C1
44 07640 006121             JSR     @ICONT
45 07641 024316             LDA     1,C267
46 07642 066034             DOB     1,MUX
47                          X.CLK   14.
48 07643 030354             LDA     2,CM14.
49                          XCLK    C1
50 07644 020235             LDA     0,C1
51 07645 006123             JSR     @.STEP
52                          MUXCLKA C5
53 07646 020241             LDA     0,C5
54 07647 006121             JSR     @ICONT
55 07650 151404             INC     2,2,SZR
56 07651 000773             JMP     .-5
57 07652 024315             LDA     1,C260
58 07653 066034             DOB     1,MUX
59                          X.CLK   16.
60 07654 030355             LDA     2,CM16.
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 0103  PSID
01                      XCLK    C1
02 07655 020235         LDA     0,C1
03 07656 006123         JSR     @.STEP
04                      MUXCLKA C5
05 07657 020241         LDA     0,C5
06 07660 006121         JSR     @ICONT
07 07661 151404         INC     2,2,SZR
08 07662 000773         JMP     .-5
09 07663 024313         LDA     1,C250
10 07664 066034         DOB     1,MUX
11                      X.CLK   16.
12 07665 030355         LDA     2,CM16.
13                      XCLK    C1
14 07666 020235         LDA     0,C1
15 07667 006123         JSR     @.STEP
16                      MUXCLKA C5
17 07670 020241         LDA     0,C5
18 07671 006121         JSR     @ICONT
19 07672 151404         INC     2,2,SZR
20 07673 000773         JMP     .-5
21 07674 024236         LDA     1,C2
22 07675 066034         DOB     1,MUX
23                      X.CLK   8.
24 07676 030351         LDA     2,CM8.
25                      XCLK    C1
26 07677 020235         LDA     0,C1
27 07700 006123         JSR     @.STEP
28                      MUXCLKA C5
29 07701 020241         LDA     0,C5
30 07702 006121         JSR     @ICONT
31 07703 151404         INC     2,2,SZR
32 07704 000773         JMP     .-5
33 07705 060434         DIA     0,MUX
34 07706 061434         DIB     0,MUX
35 07707 024302         LDA     1,C125
36 07710 122414         SUB#    1,0,SZR
37                      EHALT                   ;RECEIVE BITMODE, CHARMODE
38 07711 006230         JSR@    IERR?
39 07712 006231         LOOPX
40 07713 000402         JMP     R030
41 07714 040270 SY270:  40270
42              R030:   SYNC    SY270           ;DO WE ENTER BITMODE  TOO EARLY?
43 07715 006226         JSR@    IENT?
44 07716 000005         5
45 07717 062677         IORST
46                      ADROUT
47 07720 030101         LDA     2,RECADR        ;ADDRESS CORRECT
48 07721 071034         DOA     2,MUX           ;BOARD
49 07722 020772         LDA     0,SY270
50 07723 063034         DOC     0,MUX
51 07724 151400         INC     2,2
52 07725 071034         DOA     2,MUX
53 07726 063034         DOC     0,MUX
54                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
55 07727 006155         JSR@    ITRMT
56 07730 100031 100000+LOOPBACK+NOPARITY+CODE8
57                      XCLK    C1
58 07731 020235         LDA     0,C1
59 07732 006123         JSR     @.STEP
60                      RECEIVER                ;TRANSMIT
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 0104  PSID
01 07733 020101          LDA     0,RECADR
02 07734 061034          DOA     0,MUX              ;ENABLE RECEIVER
03 07735 126520          SUBZL   1,1
04 07736 067034          DOC     1,MUX              ;START RECEIVER
05                       MUXCLKA C1                 ;01010/10110111/00010111---
06 07737 020235          LDA     0,C1
07 07740 006121          JSR     @ICONT
08 07741 024266          LDA     1,C27
09 07742 066034          DOB     1,MUX
10                       X.CLK   14.
11 07743 030354          LDA     2,CM14.
12                       XCLK    C1
13 07744 020235          LDA     0,C1
14 07745 006123          JSR     @.STEP
15                       MUXCLKA C5
16 07746 020241          LDA     0,C5
17 07747 006121          JSR     @ICONT
18 07750 151404          INC     2,2,SZR
19 07751 000773          JMP     .-5
20 07752 024311          LDA     1,C237
21 07753 066034          DOB     1,MUX
22                       X.CLK   16.
23 07754 030355          LDA     2,CM16.
24                       XCLK    C1
25 07755 020235          LDA     0,C1
26 07756 006123          JSR     @.STEP
27                       MUXCLKA C5
28 07757 020241          LDA     0,C5
29 07760 006121          JSR     @ICONT
30 07761 151404          INC     2,2,SZR
31 07762 000773          JMP     .-5
32 07763 024257          LDA     1,C12
33 07764 066034          DOB     1,MUX
34                       X.CLK   12.
35 07765 030353          LDA     2,CM12.
36                       XCLK    C1
37 07766 020235          LDA     0,C1
38 07767 006123          JSR     @.STEP
39                       MUXCLKA C5
40 07770 020241          LDA     0,C5
41 07771 006121          JSR     @ICONT
42 07772 151404          INC     2,2,SZR
43 07773 000773          JMP     .-5
44 07774 060434          DIA     0,MUX
45 07775 101233          MOVZR#  0,0,SNC
46                       EHALT                      ;RECEIVE BITMODE, LATCH
47 07776 006230          JSR@    IERR?
48 07777 006231          LOOPX                      ;COUNTER
49
50 10000 006226 R031:    JSR@    IENT?              ;CHECK THAT RCV-DN DOES NOT SET
51 10001 000005          5
52 10002 062677          IORST
53                                                  ;WHEN SYNC WORD IS TRANSMITTED-
54                                                  ;SYN WORD SHOULD BE STRIPPED
55                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
56 10003 006155          JSR@    ITRMT
57 10004 100031 100000+LOOPBACK+NOPARITY+CODE8
58                       XCLK    C1
59 10005 020235          LDA     0,C1
60 10006 006123          JSR     @.STEP
```

```
 0105  PSID
01                          RECEIVER
02 10007 020101             LDA     0,RECADR
03 10010 061034             DOA     0,MUX           ;ENABLE RECEIVER
04 10011 126520             SUBZL   1,1
05 10012 067034             DOC     1,MUX           ;START RECEIVER
06                          MUXCLKA C1
07 10013 020235             LDA     0,C1
08 10014 006121             JSR     @ICONT
09                          X.CLK   30.
10 10015 030363             LDA     2,CM30.
11                          XCLK    C1
12 10016 020235             LDA     0,C1
13 10017 006123             JSR     @.STEP
14                          MUXCLKA C5
15 10020 020241             LDA     0,C5
16 10021 006121             JSR     @ICONT
17 10022 151404             INC     2,2,SZR
18 10023 000773             JMP     .-5
19 10024 024317             LDA     1,C270
20 10025 066034             DOB     1,MUX
21                          X.CLK   16.
22 10026 030355             LDA     2,CM16.
23                          XCLK    C1
24 10027 020235             LDA     0,C1
25 10030 006123             JSR     @.STEP
26                          MUXCLKA C5
27 10031 020241             LDA     0,C5
28 10032 006121             JSR     @ICONT
29 10033 151404             INC     2,2,SZR
30 10034 000773             JMP     .-5
31 10035 024317             LDA     1,C270
32 10036 066034             DOB     1,MUX
33                          X.CLK   16.
34 10037 030355             LDA     2,CM16.
35                          XCLK    C1
36 10040 020235             LDA     0,C1
37 10041 006123             JSR     @.STEP
38                          MUXCLKA C5
39 10042 020241             LDA     0,C5
40 10043 006121             JSR     @ICONT
41 10044 151404             INC     2,2,SZR
42 10045 000773             JMP     .-5
43 10046 024317             LDA     1,C270
44 10047 066034             DOB     1,MUX
45                          X.CLK   18.
46 10050 030362             LDA     2,CM18.
47                          XCLK    C1
48 10051 020235             LDA     0,C1
49 10052 006123             JSR     @.STEP
50                          MUXCLKA C5
51 10053 020241             LDA     0,C5
52 10054 006121             JSR     @ICONT
53 10055 151404             INC     2,2,SZR
54 10056 000773             JMP     .-5
55 10057 060434             DIA     0,MUX
56 10060 101233             MOVZR#  0,0,SNC
57                          EHALT                   ;I2 STATE NOT ENTERED
58 10061 006230             JSR@    IERR?
59 10062 006231             LOOPX
60 10063 006226 R032:       JSR@    IENT?           ;CHECK CHARMODE ENTERED FROM
```

```
 0106  PSID
01 10064 000005          5
02 10065 062677          IORST
03                                                ;12 STATE- TRANSMIT 4 SYNS,
04                                                ;THEN CHARACTER
05                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
06 10066 006155          JSR@    ITRMT
07 10067 100031 100000+LOOPBACK+NOPARITY+CODE8
08                       XCLK    C1
09 10070 020235          LDA     0,C1
10 10071 006123          JSR     @.STEP
11                       RECEIVER
12 10072 020101          LDA     0,RECADR
13 10073 061034          DOA     0,MUX            ;ENABLE RECEIVER
14 10074 126520          SUBZL   1,1
15 10075 067034          DOC     1,MUX            ;START RECEIVER
16                       MUXCLKA C1
17 10076 020235          LDA     0,C1
18 10077 006121          JSR     @ICONT
19 10100 024317          LDA     1,C270
20 10101 066034          DOB     1,MUX
21                       X.CLK   14.
22 10102 030354          LDA     2,CM14.
23                       XCLK    C1
24 10103 020235          LDA     0,C1
25 10104 006123          JSR     @.STEP
26                       MUXCLKA C5
27 10105 020241          LDA     0,C5
28 10106 006121          JSR     @ICONT
29 10107 151404          INC     2,2,SZR
30 10110 000773          JMP     .-5
31 10111 024317          LDA     1,C270
32 10112 066034          DOB     1,MUX
33                       X.CLK   16.
34 10113 030355          LDA     2,CM16.
35                       XCLK    C1
36 10114 020235          LDA     0,C1
37 10115 006123          JSR     @.STEP
38                       MUXCLKA C5
39 10116 020241          LDA     0,C5
40 10117 006121          JSR     @ICONT
41 10120 151404          INC     2,2,SZR
42 10121 000773          JMP     .-5
43 10122 024317          LDA     1,C270
44 10123 066034          DOB     1,MUX
45                       X.CLK   16.
46 10124 030355          LDA     2,CM16.
47                       XCLK    C1
48 10125 020235          LDA     0,C1
49 10126 006123          JSR     @.STEP
50                       MUXCLKA C5
51 10127 020241          LDA     0,C5
52 10130 006121          JSR     @ICONT
53 10131 151404          INC     2,2,SZR
54 10132 000773          JMP     .-5
55 10133 024317          LDA     1,C270
56 10134 066034          DOB     1,MUX
57                       X.CLK   16.
58 10135 030355          LDA     2,CM16.
59                       XCLK    C1
60 10136 020235          LDA     0,C1
```

```
 0107  PSID
01 10137 006123          JSR     @.STEP
02                       MUXCLKA C5
03 10140 020241          LDA     0,C5
04 10141 006121          JSR     @ICONT
05 10142 151404          INC     2,2,SZR
06 10143 000773          JMP     .-5
07 10144 024302          LDA     1,C125
08 10145 066034          DOB     1,MUX
09                       X.CLK   18.
10 10146 030362          LDA     2,CM18.
11                       XCLK    C1
12 10147 020235          LDA     0,C1
13 10150 006123          JSR     @.STEP
14                       MUXCLKA C5
15 10151 020241          LDA     0,C5
16 10152 006121          JSR     @ICONT
17 10153 151404          INC     2,2,SZR
18 10154 000773          JMP     .-5
19 10155 060434          DIA     0,MUX
20 10156 101232          MOVZR#  0,0,SZC
21                       EHALT                   ;CHARMODE NEVER SET AFTER
22 10157 006230          JSR@    IERR?
23 10160 006231          LOOPX                   ;I2 STATE
24 10161 006226 T012:    JSR@    IENT?           ;TRY TO RECEIVE A CHARACTER
25 10162 000005          5
26 10163 062677          IORST
27                                               ;WITHOUT TURNING ON THE RECEIVER
28                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
29 10164 006155          JSR@    ITRMT
30 10165 100031 100000+LOOPBACK+NOPARITY+CODE8
31                       XCLK    C1
32 10166 020235          LDA     0,C1
33 10167 006123          JSR     @.STEP
34                       MUXCLKA C1
35 10170 020235          LDA     0,C1
36 10171 006121          JSR     @ICONT
37                       X.CLK   30.
38 10172 030363          LDA     2,CM30.
39                       XCLK    C1
40 10173 020235          LDA     0,C1
41 10174 006123          JSR     @.STEP
42                       MUXCLKA C5
43 10175 020241          LDA     0,C5
44 10176 006121          JSR     @ICONT
45 10177 151404          INC     2,2,SZR
46 10200 000773          JMP     .-5
47 10201 126400          SUB     1,1
48 10202 066034          DOB     1,MUX
49                       X.CLK   18.
50 10203 030362          LDA     2,CM18.
51                       XCLK    C1
52 10204 020235          LDA     0,C1
53 10205 006123          JSR     @.STEP
54                       MUXCLKA C5
55 10206 020241          LDA     0,C5
56 10207 006121          JSR     @ICONT
57 10210 151404          INC     2,2,SZR
58 10211 000773          JMP     .-5
59 10212 060434          DIA     0,MUX
60 10213 101233          MOVZR#  0,0,SNC
```

```
 0108  PSID
01                      EHALT                           ;CHECK RON, RESET TO
02 10214 006230         JSR@    IERR?
03 10215 006231         LOOPX                           ;RECEIVE LOGIC
04
05 10216 006226 T013:   JSR@    IENT?                  ;CHECK NO XDAT
06 10217 000005         5
07 10220 062677         IORST
08                                                      ;WITHOUT MUX BD DINC
09                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
10 10221 006155         JSR@    ITRMT
11 10222 100031 100000+LOOPBACK+NOPARITY+CODE8
12                      MUXCLKA C5                      ;SET XDAT HIGH
13 10223 020241         LDA     0,C5
14 10224 006121         JSR     @ICONT
15 10225 060434         DIA     0,MUX
16 10226 126400         SUB     1,1
17 10227 065434         DIB     1,MUX
18 10230 020072         LDA     0,XMSK
19 10231 123414         AND#    1,0,SZR
20                      EHALT                           ;MUX BD DINC ALWAYS ON,
21 10232 006230         JSR@    IERR?
22 10233 006231         LOOPX                           ;DIC O.C. GATE
23 10234 006226 T013A:  JSR@    IENT?                  ;CHECK XDAT WITHOUT MUX BD SEL
24 10235 000005         5
25 10236 062677         IORST
26                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
27 10237 006155         JSR@    ITRMT
28 10240 100031 100000+LOOPBACK+NOPARITY+CODE8
29                      MUXCLKA C5
30 10241 020241         LDA     0,C5
31 10242 006121         JSR     @ICONT
32 10243 060434         DIA     0,MUX
33 10244 126400         SUB     1,1
34 10245 066400         DIC     1,0
35 10246 020072         LDA     0,XMSK
36 10247 123414         AND#    1,0,SZR
37                      EHALT                           ;MUX BD SEL  INPUT TO MUX BD DINC
38 10250 006230         JSR@    IERR?
39 10251 006231         LOOPX                           ;HIGH OR FLOATING
40
41 10252 006226 T014:   JSR@    IENT?                  ;CHECK NO PARITY ERROR,
42 10253 000005         5
43 10254 062677         IORST
44                                                      ;OVERRUN,OR OTHER BITS ON
45                                                      ;DIC ON A GOOD TRANSMISSION
46                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
47 10255 006155         JSR@    ITRMT
48 10256 100031 100000+LOOPBACK+NOPARITY+CODE8
49                      CHARA   377,8.
50 10257 006125         JSR@    ICHRA
51 10260 000377         377
52 10261 000036         4*8.-2
53 10262 000022         2*8.+2+(2*(8.-8.))
54 10263 060434         DIA     0,MUX
55 10264 061434         DIB     0,MUX
56 10265 062434         DIC     0,MUX
57 10266 024267         LDA     1,C30
58 10267 124000         COM     1,1
59 10270 123414         AND#    1,0,SZR
60                      EHALT                           ;CHECK DIC INPUT, PARITY
```

```
 0109  PSID
01 10271 006230          JSR@    IERR?
02 10272 006231          LOOPX                   ;GENERATOR, OVERRUN,
03                                                ;DIC O.C. GATES
04 10273 006226 T015:    JSR@    IENT?           ;TRY TO INPUT DATA WITH DIB 0
05 10274 000005          5
06 10275 062677          IORST
07                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
08 10276 006155          JSR@    ITRMT
09 10277 100031 100000+LOOPBACK+NOPARITY+CODE8
10                       CHARA   377,8.
11 10300 006125          JSR@    ICHRA
12 10301 000377          377
13 10302 000036          4*8.-2
14 10303 000022          2*8.+2+(2*(8.-8.))
15 10304 060434          DIA     0,MUX
16 10305 102400          SUB     0,0
17 10306 061400          DIB     0,0
18 10307 101004          MOV     0,0,SZR
19                                                ;CHECK MUX BD SEL TO RD RCV DATA
20 10310 006230          JSR@    IERR?
21 10311 006231          LOOPX
22
23 10312 006226 T016:    JSR@    IENT?           ;TRY TO INPUT DATA WITH DIC MUX SEL
24 10313 000005          5
25 10314 062677          IORST
26                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
27 10315 006155          JSR@    ITRMT
28 10316 100031 100000+LOOPBACK+NOPARITY+CODE8
29                       CHARA   377,8.
30 10317 006125          JSR@    ICHRA
31 10320 000377          377
32 10321 000036          4*8.-2
33 10322 000022          2*8.+2+(2*(8.-8.))
34 10323 060434          DIA     0,MUX
35 10324 062434          DIC     0,MUX
36 10325 024326          LDA     1,C377
37 10326 122415          SUB#    1,0,SNR
38                                                ;CHECK RD RCV DATA,  O.C. GATES
39 10327 006230          JSR@    IERR?
40 10330 006231          LOOPX
41 10331 006226 T017:    JSR@    IENT?           ;TRY TO OUTPUT LINE CHARAC-
42 10332 000005          5
43 10333 062677          IORST
44                                                ;TERISTICS WITHOUT BIT 0
45                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
46 10334 006155          JSR@    ITRMT
47 10335 100031 100000+LOOPBACK+NOPARITY+CODE8
48                       XCLK    C1              ;SET UP 8 LEVEL CODE
49 10336 020235          LDA     0,C1
50 10337 006123          JSR     @.STEP
51                       RECEIVER
52 10340 020101          LDA     0,RECADR
53 10341 061034          DOA     0,MUX           ;ENABLE RECEIVER
54 10342 126520          SUBZL   1,1
55 10343 067034          DOC     1,MUX           ;START RECEIVER
56                       MUXCLKA C1              ;AND SEND OUT 2 SYNC WORDS
57 10344 020235          LDA     0,C1
58 10345 006121          JSR     @ICONT
59                       X.CLK   30.
60 10346 030363          LDA     2,CM30.
```

```
 0110  PSID
01                      XCLK    C1
02 10347 020235         LDA     0,C1
03 10350 006123         JSR     @.STEP
04                      MUXCLKA C5
05 10351 020241         LDA     0,C5
06 10352 006121         JSR     @ICONT
07 10353 151404         INC     2,2,SZR
08 10354 000773         JMP     .-5
09 10355 024256         LDA     1,C11           ;OUTPUT 6 LEVEL LC'S
10 10356 067034         DOC     1,MUX           ;WITHOUT BIT 0
11 10357 066034         DOB     1,MUX           ;SEND OUT CHARACTER
12                      X.CLK   14.
13 10360 030354         LDA     2,CM14.
14                      XCLK    C1
15 10361 020235         LDA     0,C1
16 10362 006123         JSR     @.STEP
17                      MUXCLKA C5
18 10363 020241         LDA     0,C5
19 10364 006121         JSR     @ICONT
20 10365 151404         INC     2,2,SZR
21 10366 000773         JMP     .-5
22 10367 060434         DIA     0,MUX
23 10370 101233         MOVZR#  0,0,SNC
24                      EHALT                   ;LCST ROM
25 10371 006230         JSR@    IERR?
26 10372 006231         LOOPX
27
28 10373 006226 T018:   JSR@    IENT?           ;OUTPUT LC'S WITH DOB (ILLEGAL)
29 10374 000005         5
30 10375 062677         IORST
31                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
32 10376 006155         JSR@    ITRMT
33 10377 100031 100000+LOOPBACK+NOPARITY+CODE8
34                      XCLK    C1
35 10400 020235         LDA     0,C1
36 10401 006123         JSR     @.STEP
37                      RECEIVER
38 10402 020101         LDA     0,RECADR
39 10403 061034         DOA     0,MUX           ;ENABLE RECEIVER
40 10404 126520         SUBZL   1,1
41 10405 067034         DOC     1,MUX           ;START RECEIVER
42                      MUXCLKA C1
43 10406 020235         LDA     0,C1
44 10407 006121         JSR     @ICONT
45                      X.CLK   30.
46 10410 030363         LDA     2,CM30.
47                      XCLK    C1
48 10411 020235         LDA     0,C1
49 10412 006123         JSR     @.STEP
50                      MUXCLKA C5
51 10413 020241         LDA     0,C5
52 10414 006121         JSR     @ICONT
53 10415 151404         INC     2,2,SZR
54 10416 000773         JMP     .-5
55 10417 024256         LDA     1,C11
56 10420 066034         DOB     1,MUX           ;TRANSMIT AT SAME TIME
57                      X.CLK   14.
58 10421 030354         LDA     2,CM14.
59                      XCLK    C1
60 10422 020235         LDA     0,C1
```

```
 0111  PSID
01 10423 006123          JSR     @.STEP
02                       MUXCLKA C5
03 10424 020241          LDA     0,C5
04 10425 006121          JSR     @ICONT
05 10426 151404          INC     2,2,SZR
06 10427 000773          JMP     .-5
07 10430 060434          DIA     0,MUX
08 10431 101233          MOVZR#  0,0,SNC
09                       EHALT                       ;DOC TO LCST ROM
10 10432 006230          JSR@    IERR?
11 10433 006231          LOOPX
12 10434 006226 T019:    JSR@    IENT?               ;TRY TO OUTPUT LC'S WITH DOC 0
13 10435 000005          5
14 10436 062677          IORST
15                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
16 10437 006155          JSR@    ITRMT
17 10440 100031 100000+LOOPBACK+NOPARITY+CODE8
18                       XCLK    C1
19 10441 020235          LDA     0,C1
20 10442 006123          JSR     @.STEP
21                       RECEIVER
22 10443 020101          LDA     0,RECADR
23 10444 061034          DOA     0,MUX               ;ENABLE RECEIVER
24 10445 126520          SUBZL   1,1
25 10446 067034          DOC     1,MUX               ;START RECEIVER
26                       MUXCLKA C1
27 10447 020235          LDA     0,C1
28 10450 006121          JSR     @ICONT
29                       X.CLK   30.
30 10451 030363          LDA     2,CM30.
31                       XCLK    C1
32 10452 020235          LDA     0,C1
33 10453 006123          JSR     @.STEP
34                       MUXCLKA C5
35 10454 020241          LDA     0,C5
36 10455 006121          JSR     @ICONT
37 10456 151404          INC     2,2,SZR
38 10457 000773          JMP     .-5
39 10460 024340          LDA     1,C100011
40 10461 067000          DOC     1,0
41 10462 126520          SUBZL   1,1
42 10463 066034          DOB     1,MUX               ;TRANSMIT CHARACTER
43                       X.CLK   14.
44 10464 030354          LDA     2,CM14.
45                       XCLK    C1
46 10465 020235          LDA     0,C1
47 10466 006123          JSR     @.STEP
48                       MUXCLKA C5
49 10467 020241          LDA     0,C5
50 10470 006121          JSR     @ICONT
51 10471 151404          INC     2,2,SZR
52 10472 000773          JMP     .-5
53 10473 060434          DIA     0,MUX
54 10474 101233          MOVZR#  0,0,SNC
55                       EHALT                       ;MUX BD SEL TO LCST ROM
56 10475 006230          JSR@    IERR?
57 10476 006231          LOOPX
58
59 10477 006226 T020:    JSR@    IENT?               ;TRY TO TRANSMIT WITH DOC
60 10500 000005          5
```

```
 0112  PSID
01 10501 062677          IORST
02                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
03 10502 006155          JSR@    ITRMT
04 10503 100031 100000+LOOPBACK+NOPARITY+CODE8
05                       XCLK    C1
06 10504 020235          LDA     0,C1
07 10505 006123          JSR     @.STEP
08                       RECEIVER
09 10506 020101          LDA     0,RECADR
10 10507 061034          DOA     0,MUX           ;ENABLE RECEIVER
11 10510 126520          SUBZL   1,1
12 10511 067034          DOC     1,MUX           ;START RECEIVER
13                       MUXCLKA C1
14 10512 020235          LDA     0,C1
15 10513 006121          JSR     @ICONT
16                       X.CLK   30.
17 10514 030363          LDA     2,CM30.
18                       XCLK    C1
19 10515 020235          LDA     0,C1
20 10516 006123          JSR     @.STEP
21                       MUXCLKA C5
22 10517 020241          LDA     0,C5
23 10520 006121          JSR     @ICONT
24 10521 151404          INC     2,2,SZR
25 10522 000773          JMP     .-5
26 10523 024326          LDA     1,C377
27 10524 067034          DOC     1,MUX
28                       X.CLK   18.
29 10525 030362          LDA     2,CM18.
30                       XCLK    C1
31 10526 020235          LDA     0,C1
32 10527 006123          JSR     @.STEP
33                       MUXCLKA C5
34 10530 020241          LDA     0,C5
35 10531 006121          JSR     @ICONT
36 10532 151404          INC     2,2,SZR
37 10533 000773          JMP     .-5
38 10534 060434          DIA     0,MUX
39 10535 061434          DIB     0,MUX           ;SHOULD INPUT SYNC
40 10536 024317          LDA     1,C270          ;CHARACTER =270
41 10537 122414          SUB#    1,0,SZR
42                       EHALT                   ;DOB TO XFILE
43 10540 006230          JSR@    IERR?
44 10541 006231          LOOPX
45 10542 006226 T021:    JSR@    IENT?           ;TRY TO TRANSMIT NORMAL
46 10543 000005          5
47 10544 062677          IORST
48                                               ;CHARACTER WITH BIT 0 SET ON DOB
49                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
50 10545 006155          JSR@    ITRMT
51 10546 100031 100000+LOOPBACK+NOPARITY+CODE8
52                       CHARA   100000,8.
53 10547 006125          JSR@    ICHRA
54 10550 100000          100000
55 10551 000036          4*8.-2
56 10552 000022          2*8.+2+(2*(8.-8.))
57 10553 060434          DIA     0,MUX
58 10554 061434          DIB     0,MUX
59 10555 024317          LDA     1,C270
60 10556 122414          SUB#    1,0,SZR
```

```
 0113  PSID
01                      EHALT                   ;DATA0 INPUT TO XFILE
02 10557 006230         JSR@    IERR?
03 10560 006231         LOOPX
04
05 10561 006226 T022:   JSR@    IENT?          ;TRY TO XMIT NORMAL CHAR-
06 10562 000005         5
07 10563 062677         IORST
08                                             ;ACTER WITH BIT 1 SET
09                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
10 10564 006155         JSR@    ITRMT
11 10565 100031 100000+LOOPBACK+NOPARITY+CODE8
12                      CHARA   40001,8.
13 10566 006125         JSR@    ICHRA
14 10567 040001         40001
15 10570 000036         4*8.-2
16 10571 000022         2*8.+2+(2*(8.-8.))
17 10572 060434         DIA     0,MUX
18 10573 061434         DIB     0,MUX
19 10574 024317         LDA     1,C270
20 10575 122414         SUB#    1,0,SZR
21                      EHALT                   ;DATA1 INPUT TO XFILE
22 10576 006230         JSR@    IERR?
23 10577 006231         LOOPX
24 10600 006226 T023:   JSR@    IENT?          ;OUTPUT XMIT SYNC WITHOUT
25 10601 000005         5
26 10602 062677         IORST
27 10603 020102         LDA     0,TRADR        ;BIT 1- SHOULD NOT WORK
28 10604 061034         DOA     0,MUX
29                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
30 10605 006155         JSR@    ITRMT
31 10606 100031 100000+LOOPBACK+NOPARITY+CODE8
32                      CHARA   1,8.
33 10607 006125         JSR@    ICHRA
34 10610 000001         1
35 10611 000036         4*8.-2
36 10612 000022         2*8.+2+(2*(8.-8.))
37 10613 060434         DIA     0,MUX
38 10614 101232         MOVZR#  0,0,SZC        ;DID XMITTING 1 CAUSE RECVR
39                      EHALT                  ;TO STAY IN I2 STATE?  IF YES,
40 10615 006230         JSR@    IERR?
41 10616 006231         LOOPX                  ;FAILURE- DATA1 TO XFILE
42
43 10617 006226 T024:   JSR@    IENT?          ;OUTPUT XMIT SYN WITH BIT 0-
44 10620 000005         5
45 10621 062677         IORST
46 10622 020101         LDA     0,RECADR       ;STILL SHOULD NOT WORK
47 10623 061034         DOA     0,MUX
48 10624 024343         LDA     1,C140000      ;ZERO SYNC WORD
49 10625 067034         DOC     1,MUX
50 10626 101400         INC     0,0
51 10627 061034         DOA     0,MUX
52 10630 067034         DOC     1,MUX
53                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
54 10631 006155         JSR@    ITRMT
55 10632 100031 100000+LOOPBACK+NOPARITY+CODE8
56                      CHARA   0,8.
57 10633 006125         JSR@    ICHRA
58 10634 000000         0
59 10635 000036         4*8.-2
60 10636 000022         2*8.+2+(2*(8.-8.))
```

```
 0114  PSID
01 10637 060434          DIA     0,MUX
02 10640 101232          MOVZR#  0,0,SZC
03                       EHALT                   ;DATO TO XFILE
04 10641 006230          JSR@    IERR?
05 10642 006231          LOOPX
06                ;CHECK BITS OF SYNC WORD ONE AT A TIME
07
08                T034:  SYNC    SY000
09 10643 006226          JSR@    IENT?
10 10644 000005          5
11 10645 062677          IORST
12                       ADROUT
13 10646 030101          LDA     2,RECADR        ;ADDRESS CORRECT
14 10647 071034          DOA     2,MUX           ;BOARD
15 10650 020366          LDA     0,SY000
16 10651 063034          DOC     0,MUX
17 10652 151400          INC     2,2
18 10653 071034          DOA     2,MUX
19 10654 063034          DOC     0,MUX
20                       DATAOUT 377
21                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
22 10655 006155          JSR@    ITRMT
23 10656 100031 100000+LOOPBACK+NOPARITY+CODE8
24                       CHARA   377,8.
25 10657 006125          JSR@    ICHRA
26 10660 000377          377
27 10661 000036          4*8.-2
28 10662 000022          2*8.+2+(2*(8.-8.))
29 10663 060434          DIA     0,MUX
30 10664 061434          DIB     0,MUX           ;INPUT RECEIVE DATA
31 10665 024326          LDA     1,C377
32 10666 122414          SUB#    1,0,SZR         ;DOES DATA MATCH?
33                       EHALT                   ;NO, CHECK RECEIVER SYNC
34 10667 006230          JSR@    IERR?
35 10670 006231          LOOPX                   ;WORD STORAGE, COMPARATOR
36                T035:  SYNC    SY001
37 10671 006226          JSR@    IENT?
38 10672 000005          5
39 10673 062677          IORST
40                       ADROUT
41 10674 030101          LDA     2,RECADR        ;ADDRESS CORRECT
42 10675 071034          DOA     2,MUX           ;BOARD
43 10676 020450          LDA     0,SY001
44 10677 063034          DOC     0,MUX
45 10700 151400          INC     2,2
46 10701 071034          DOA     2,MUX
47 10702 063034          DOC     0,MUX
48                       DATAOUT 377
49                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
50 10703 006155          JSR@    ITRMT
51 10704 100031 100000+LOOPBACK+NOPARITY+CODE8
52                       CHARA   377,8.
53 10705 006125          JSR@    ICHRA
54 10706 000377          377
55 10707 000036          4*8.-2
56 10710 000022          2*8.+2+(2*(8.-8.))
57 10711 060434          DIA     0,MUX
58 10712 061434          DIB     0,MUX           ;INPUT RECEIVE DATA
59 10713 024326          LDA     1,C377
60 10714 122414          SUB#    1,0,SZR         ;DOES DATA MATCH?
```

```
 0115  PSID
01                      EHALT                   ;NO, CHECK RECEIVER SYNC
02 10715 006230         JSR@    IERR?
03 10716 006231         LOOPX                   ;WORD STORAGE, COMPARATOR
04              T036:   SYNC    SY002
05 10717 006226         JSR@    IENT?
06 10720 000005         5
07 10721 062677         IORST
08                      ADROUT
09 10722 030101         LDA     2,RECADR        ;ADDRESS CORRECT
10 10723 071034         DOA     2,MUX           ;BOARD
11 10724 020423         LDA     0,SY002
12 10725 063034         DOC     0,MUX
13 10726 151400         INC     2,2
14 10727 071034         DOA     2,MUX
15 10730 063034         DOC     0,MUX
16                      DATAOUT 377
17                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
18 10731 006155         JSR@    ITRMT
19 10732 100031 100000+LOOPBACK+NOPARITY+CODE8
20                      CHARA   377,8.
21 10733 006125         JSR@    ICHRA
22 10734 000377         377
23 10735 000036         4*8.-2
24 10736 000022         2*8.+2+(2*(8.-8.))
25 10737 060434         DIA     0,MUX
26 10740 061434         DIB     0,MUX           ;INPUT RECEIVE DATA
27 10741 024326         LDA     1,C377
28 10742 122414         SUB#    1,0,SZR         ;DOES DATA MATCH?
29                      EHALT                   ;NO, CHECK RECEIVER SYNC
30 10743 006230         JSR@    IERR?
31 10744 006231         LOOPX                   ;WORD STORAGE, COMPARATOR
32 10745 000405         JMP     T037
33 10746 040001 SY001:  40001
34 10747 040002 SY002:  40002
35 10750 040004 SY004:  40004
36 10751 040010 SY010:  40010
37              T037:   SYNC    SY004
38 10752 006226         JSR@    IENT?
39 10753 000005         5
40 10754 062677         IORST
41                      ADROUT
42 10755 030101         LDA     2,RECADR        ;ADDRESS CORRECT
43 10756 071034         DOA     2,MUX           ;BOARD
44 10757 020771         LDA     0,SY004
45 10760 063034         DOC     0,MUX
46 10761 151400         INC     2,2
47 10762 071034         DOA     2,MUX
48 10763 063034         DOC     0,MUX
49                      DATAOUT 377
50                      TRANSMIT        LOOPBACK,NOPARITY,CODE8
51 10764 006155         JSR@    ITRMT
52 10765 100031 100000+LOOPBACK+NOPARITY+CODE8
53                      CHARA   377,8.
54 10766 006125         JSR@    ICHRA
55 10767 000377         377
56 10770 000036         4*8.-2
57 10771 000022         2*8.+2+(2*(8.-8.))
58 10772 060434         DIA     0,MUX
59 10773 061434         DIB     0,MUX           ;INPUT RECEIVE DATA
60 10774 024326         LDA     1,C377
```

```
 0116  PSID
01 10775 122414          SUB#    1,0,SZR          ;DOES DATA MATCH?
02                       EHALT                    ;NO, CHECK RECEIVER SYNC
03 10776 006230          JSR@    IERR?
04 10777 006231          LOOPX                    ;WORD STORAGE, COMPARATOR
05                T038:  SYNC    SY010
06 11000 006226          JSR@    IENT?
07 11001 000005          5
08 11002 062677          IORST
09                       ADROUT
10 11003 030101          LDA     2,RECADR         ;ADDRESS CORRECT
11 11004 071034          DOA     2,MUX            ;BOARD
12 11005 020744          LDA     0,SY010
13 11006 063034          DOC     0,MUX
14 11007 151400          INC     2,2
15 11010 071034          DOA     2,MUX
16 11011 063034          DOC     0,MUX
17                       DATAOUT 377
18                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
19 11012 006155          JSR@    ITRMT
20 11013 100031 100000+LOOPBACK+NOPARITY+CODE8
21                       CHARA   377,8.
22 11014 006125          JSR@    ICHRA
23 11015 000377          377
24 11016 000036          4*8.-2
25 11017 000022          2*8.+2+(2*(8.-8.))
26 11020 060434          DIA     0,MUX
27 11021 061434          DIB     0,MUX            ;INPUT RECEIVE DATA
28 11022 024326          LDA     1,C377
29 11023 122414          SUB#    1,0,SZR          ;DOES DATA MATCH?
30                       EHALT                    ;NO, CHECK RECEIVER SYNC
31 11024 006230          JSR@    IERR?
32 11025 006231          LOOPX                    ;WORD STORAGE, COMPARATOR
33                T039:  SYNC    SY020
34 11026 006226          JSR@    IENT?
35 11027 000005          5
36 11030 062677          IORST
37                       ADROUT
38 11031 030101          LDA     2,RECADR         ;ADDRESS CORRECT
39 11032 071034          DOA     2,MUX            ;BOARD
40 11033 020450          LDA     0,SY020
41 11034 063034          DOC     0,MUX
42 11035 151400          INC     2,2
43 11036 071034          DOA     2,MUX
44 11037 063034          DOC     0,MUX
45                       DATAOUT 377
46                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
47 11040 006155          JSR@    ITRMT
48 11041 100031 100000+LOOPBACK+NOPARITY+CODE8
49                       CHARA   377,8.
50 11042 006125          JSR@    ICHRA
51 11043 000377          377
52 11044 000036          4*8.-2
53 11045 000022          2*8.+2+(2*(8.-8.))
54 11046 060434          DIA     0,MUX
55 11047 061434          DIB     0,MUX            ;INPUT RECEIVE DATA
56 11050 024326          LDA     1,C377
57 11051 122414          SUB#    1,0,SZR          ;DOES DATA MATCH?
58                       EHALT                    ;NO, CHECK RECEIVER SYNC
59 11052 006230          JSR@    IERR?
60 11053 006231          LOOPX                    ;WORD STORAGE, COMPARATOR
```

```
 0117  PSID
01                T040:   SYNC    SY040
02  11054 006226          JSR@    IENT?
03  11055 000005          5
04  11056 062677          IORST
05                        ADROUT
06  11057 030101          LDA     2,RECADR        ;ADDRESS CORRECT
07  11060 071034          DOA     2,MUX           ;BOARD
08  11061 020423          LDA     0,SY040
09  11062 063034          DOC     0,MUX
10  11063 151400          INC     2,2
11  11064 071034          DOA     2,MUX
12  11065 063034          DOC     0,MUX
13                        DATAOUT 377
14                        TRANSMIT        LOOPBACK,NOPARITY,CODE8
15  11066 006155          JSR@    ITRMT
16  11067 100031 100000+LOOPBACK+NOPARITY+CODE8
17                        CHARA   377,8.
18  11070 006125          JSR@    ICHRA
19  11071 000377          377
20  11072 000036          4*8.-2
21  11073 000022          2*8.+2+(2*(8.-8.))
22  11074 060434          DIA     0,MUX
23  11075 061434          DIB     0,MUX           ;INPUT RECEIVE DATA
24  11076 024326          LDA     1,C377
25  11077 122414          SUB#    1,0,SZR         ;DOES DATA MATCH?
26                        EHALT                   ;NO, CHECK RECEIVER SYNC
27  11100 006230          JSR@    IERR?
28  11101 006231          LOOPX                   ;WORD STORAGE, COMPARATOR
29  11102 000406          JMP     T041
30  11103 040020 SY020:   40020
31  11104 040040 SY040:   40040
32  11105 040100 SY100:   40100
33  11106 040200 SY200:   40200
34  11107 040052 SY052:   40052
35                T041:   SYNC    SY100
36  11110 006226          JSR@    IENT?
37  11111 000005          5
38  11112 062677          IORST
39                        ADROUT
40  11113 030101          LDA     2,RECADR        ;ADDRESS CORRECT
41  11114 071034          DOA     2,MUX           ;BOARD
42  11115 020770          LDA     0,SY100
43  11116 063034          DOC     0,MUX
44  11117 151400          INC     2,2
45  11120 071034          DOA     2,MUX
46  11121 063034          DOC     0,MUX
47                        DATAOUT 377
48                        TRANSMIT        LOOPBACK,NOPARITY,CODE8
49  11122 006155          JSR@    ITRMT
50  11123 100031 100000+LOOPBACK+NOPARITY+CODE8
51                        CHARA   377,8.
52  11124 006125          JSR@    ICHRA
53  11125 000377          377
54  11126 000036          4*8.-2
55  11127 000022          2*8.+2+(2*(8.-8.))
56  11130 060434          DIA     0,MUX
57  11131 061434          DIB     0,MUX           ;INPUT RECEIVE DATA
58  11132 024326          LDA     1,C377
59  11133 122414          SUB#    1,0,SZR         ;DOES DATA MATCH?
60                        EHALT                   ;NO, CHECK RECEIVER SYNC
```

```
 0118  PSID
01 11134 006230          JSR@    IERR?
02 11135 006231          LOOPX                       ;WORD STORAGE, COMPARATOR
03                T042:  SYNC    SY200
04 11136 006226          JSR@    IENT?
05 11137 000005          5
06 11140 062677          IORST
07                       ADROUT
08 11141 030101          LDA     2,RECADR            ;ADDRESS CORRECT
09 11142 071034          DOA     2,MUX               ;BOARD
10 11143 020743          LDA     0,SY200
11 11144 063034          DOC     0,MUX
12 11145 151400          INC     2,2
13 11146 071034          DOA     2,MUX
14 11147 063034          DOC     0,MUX
15                       DATAOUT 377
16                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
17 11150 006155          JSR@    ITRMT
18 11151 100031 100000+LOOPBACK+NOPARITY+CODE8
19                       CHARA   377,8.
20 11152 006125          JSR@    ICHRA
21 11153 000377          377
22 11154 000036          4*8.-2
23 11155 000022          2*8.+2+(2*(8.-8.))
24 11156 060434          DIA     0,MUX
25 11157 061434          DIB     0,MUX               ;INPUT RECEIVE DATA
26 11160 024326          LDA     1,C377
27 11161 122414          SUB#    1,0,SZR             ;DOES DATA MATCH?
28                       EHALT                       ;NO, CHECK RECEIVER SYNC
29 11162 006230          JSR@    IERR?
30 11163 006231          LOOPX                       ;WORD STORAGE, COMPARATOR
31                ;CHECK PARITY GENERATION
32
33                T046:  SYNC    SY052               ;00 101 010 SYNC WORD
34 11164 006226          JSR@    IENT?
35 11165 000005          5
36 11166 062677          IORST
37                       ADROUT
38 11167 030101          LDA     2,RECADR            ;ADDRESS CORRECT
39 11170 071034          DOA     2,MUX               ;BOARD
40 11171 020716          LDA     0,SY052
41 11172 063034          DOC     0,MUX
42 11173 151400          INC     2,2
43 11174 071034          DOA     2,MUX
44 11175 063034          DOC     0,MUX
45                                                   ;8 LEVEL, EVEN, BIT GENERATED
46                       TRANSMIT        LOOPBACK,EVENPARITY,CODE8
47 11176 006155          JSR@    ITRMT
48 11177 100035 100000+LOOPBACK+EVENPARITY+CODE8
49                       CHARA   177,8.
50 11200 006125          JSR@    ICHRA
51 11201 000177          177
52 11202 000036          4*8.-2
53 11203 000022          2*8.+2+(2*(8.-8.))
54 11204 060434          DIA     0,MUX
55 11205 061434          DIB     0,MUX
56 11206 024326          LDA     1,C377
57 11207 122414          SUB#    1,0,SZR
58                       EHALT                       ;PARITY GENERATOR,
59 11210 006230          JSR@    IERR?
60 11211 006231          LOOPX                       ;LC DECODING
```

```
 0119  PSID
01 11212 006226 T047:   JSR@    IENT?           ;8 LEVEL EVEN NO BIT
02 11213 000005         5
03 11214 062677         IORST
04                      TRANSMIT        LOOPBACK,EVENPARITY,CODE8
05 11215 006155         JSR@    ITRMT
06 11216 100035 100000+LOOPBACK+EVENPARITY+CODE8
07                      DATACHECK       167,8.
08                      CHARA   167,8.
09 11217 006125         JSR@    ICHRA
10 11220 000167         167
11 11221 000036         4*8.-2
12 11222 000022         2*8.+2+(2*(8.-8.))
13 11223 060434         DIA     0,MUX
14 11224 061434         DIB     0,MUX
15 11225 024305         LDA     1,C167
16 11226 122414         SUB#    1,0,SZR         ;DOES RECEIVE WORD MATCH?
17                      EHALT                   ;NO, CHECK TRANSMITTER AND
18 11227 006230         JSR@    IERR?
19 11230 006231         LOOPX                   ;RECEIVER BUFFERS, LC DECODING
20                                              ;PARITY GENERATOR
21
22 11231 006226 T048:   JSR@    IENT?           ;8 LEVEL,ODD, NO BIT
23 11232 000005         5
24 11233 062677         IORST
25                      TRANSMIT        LOOPBACK,ODDPARITY,CODE8
26 11234 006155         JSR@    ITRMT
27 11235 100033 100000+LOOPBACK+ODDPARITY+CODE8
28                      DATACHECK       177,8.
29                      CHARA   177,8.
30 11236 006125         JSR@    ICHRA
31 11237 000177         177
32 11240 000036         4*8.-2
33 11241 000022         2*8.+2+(2*(8.-8.))
34 11242 060434         DIA     0,MUX
35 11243 061434         DIB     0,MUX
36 11244 024306         LDA     1,C177
37 11245 122414         SUB#    1,0,SZR         ;DOES RECEIVE WORD MATCH?
38                      EHALT                   ;NO, CHECK TRANSMITTER AND
39 11246 006230         JSR@    IERR?
40 11247 006231         LOOPX                   ;RECEIVER BUFFERS, LC DECODING
41                                              ;PARITY GENERATOR
42 11250 006226 T049:   JSR@    IENT?           ;8 LEVEL, ODD, BIT GENERATED
43 11251 000005         5
44 11252 062677         IORST
45                      TRANSMIT        LOOPBACK,ODDPARITY,CODE8
46 11253 006155         JSR@    ITRMT
47 11254 100033 100000+LOOPBACK+ODDPARITY+CODE8
48                      CHARA   167,8.
49 11255 006125         JSR@    ICHRA
50 11256 000167         167
51 11257 000036         4*8.-2
52 11260 000022         2*8.+2+(2*(8.-8.))
53 11261 060434         DIA     0,MUX
54 11262 061434         DIB     0,MUX
55 11263 024322         LDA     1,C367
56 11264 122414         SUB#    1,0,SZR
57                      EHALT                   ;PARITY GENERATOR
58 11265 006230         JSR@    IERR?
59 11266 006231         LOOPX
60
```

```
 0120  PSID
01 11267 006226 T050:   JSR@    IENT?           ;7 LEVEL, EVEN, NO BIT
02 11270 000005         5
03 11271 062677         IORST
04                      TRANSMIT        LOOPBACK,EVENPARITY,CODE7
05 11272 006155         JSR@    ITRMT
06 11273 100025 100000+LOOPBACK+EVENPARITY+CODE7
07                      DATACHECK       77,7
08                      CHARA   77,7
09 11274 006125         JSR@    ICHRA
10 11275 000077         77
11 11276 000032         4*7-2
12 11277 000022         2*7+2+(2*(8.-7))
13 11300 060434         DIA     0,MUX
14 11301 061434         DIB     0,MUX
15 11302 024276         LDA     1,C77
16 11303 122414         SUB#    1,0,SZR         ;DOES RECEIVE WORD MATCH?
17                      EHALT                   ;NO, CHECK TRANSMITTER AND
18 11304 006230         JSR@    IERR?
19 11305 006231         LOOPX                   ;RECEIVER BUFFERS, LC DECODING
20                                              ;PARITY GENERATOR
21 11306 006226 T051:   JSR@    IENT?           ;7 LEVEL, EVEN, BIT GENERATED
22 11307 000005         5
23 11310 062677         IORST
24                      TRANSMIT        LOOPBACK,EVENPARITY,CODE7
25 11311 006155         JSR@    ITRMT
26 11312 100025 100000+LOOPBACK+EVENPARITY+CODE7
27                      CHARA   67,7
28 11313 006125         JSR@    ICHRA
29 11314 000067         67
30 11315 000032         4*7-2
31 11316 000022         2*7+2+(2*(8.-7))
32 11317 060434         DIA     0,MUX
33 11320 061434         DIB     0,MUX
34 11321 024305         LDA     1,C167
35 11322 122414         SUB#    1,0,SZR
36                      EHALT                   ;PARITY GENERATOR
37 11323 006230         JSR@    IERR?
38 11324 006231         LOOPX
39 11325 006226 T052:   JSR@    IENT?           ;7 LEVEL, ODD, BIT GENERATED
40 11326 000005         5
41 11327 062677         IORST
42                      TRANSMIT        LOOPBACK,ODDPARITY,CODE7
43 11330 006155         JSR@    ITRMT
44 11331 100023 100000+LOOPBACK+ODDPARITY+CODE7
45                      CHARA   77,7
46 11332 006125         JSR@    ICHRA
47 11333 000077         77
48 11334 000032         4*7-2
49 11335 000022         2*7+2+(2*(8.-7))
50 11336 060434         DIA     0,MUX
51 11337 061434         DIB     0,MUX
52 11340 024306         LDA     1,C177
53 11341 122414         SUB#    1,0,SZR
54                      EHALT                   ;PARITY GENERATOR
55 11342 006230         JSR@    IERR?
56 11343 006231         LOOPX
57
58 11344 006226 T053:   JSR@    IENT?           ;7 LEVEL, ODD, NO BIT
59 11345 000005         5
60 11346 062677         IORST
```

```
 0121  PSID
01                      TRANSMIT        LOOPBACK,ODDPARITY,CODE7
02 11347 006155         JSR@    ITRMT
03 11350 100023 100000+LOOPBACK+ODDPARITY+CODE7
04                      DATACHECK       67,7
05                      CHARA   67,7
06 11351 006125         JSR@    ICHRA
07 11352 000067         67
08 11353 000032         4*7-2
09 11354 000022         2*7+2+(2*(8.-7))
10 11355 060434         DIA     0,MUX
11 11356 061434         DIB     0,MUX
12 11357 024274         LDA     1,C67
13 11360 122414         SUB#    1,0,SZR         ;DOES RECEIVE WORD MATCH?
14                      EHALT                   ;NO, CHECK TRANSMITTER AND
15 11361 006230         JSR@    IERR?
16 11362 006231         LOOPX                   ;RECEIVER BUFFERS, LC DECODING
17                                              ;PARITY GENERATOR
18 11363 006226 T054:   JSR@    IENT?           ;6 LEVEL, EVEN , BIT GENERATED
19 11364 000005         5
20 11365 062677         IORST
21                      TRANSMIT        LOOPBACK,EVENPARITY,CODE6
22 11366 006155         JSR@    ITRMT
23 11367 100015 100000+LOOPBACK+EVENPARITY+CODE6
24                      CHARA   37,6
25 11370 006125         JSR@    ICHRA
26 11371 000037         37
27 11372 000026         4*6-2
28 11373 000022         2*6+2+(2*(8.-6))
29 11374 060434         DIA     0,MUX
30 11375 061434         DIB     0,MUX
31 11376 024276         LDA     1,C77
32 11377 122414         SUB#    1,0,SZR
33                      EHALT                   ;PARITY GENERATOR
34 11400 006230         JSR@    IERR?
35 11401 006231         LOOPX
36
37 11402 006226 T055:   JSR@    IENT?           ;6 LEVEL,EVEN, NO BIT
38 11403 000005         5
39 11404 062677         IORST
40                      TRANSMIT        LOOPBACK,EVENPARITY,CODE6
41 11405 006155         JSR@    ITRMT
42 11406 100015 100000+LOOPBACK+EVENPARITY+CODE6
43                      DATACHECK       27,6
44                      CHARA   27,6
45 11407 006125         JSR@    ICHRA
46 11410 000027         27
47 11411 000026         4*6-2
48 11412 000022         2*6+2+(2*(8.-6))
49 11413 060434         DIA     0,MUX
50 11414 061434         DIB     0,MUX
51 11415 024266         LDA     1,C27
52 11416 122414         SUB#    1,0,SZR         ;DOES RECEIVE WORD MATCH?
53                      EHALT                   ;NO, CHECK TRANSMITTER AND
54 11417 006230         JSR@    IERR?
55 11420 006231         LOOPX                   ;RECEIVER BUFFERS, LC DECODING
56                                              ;PARITY GENERATOR
57 11421 006226 T056:   JSR@    IENT?           ;6 LEVEL,ODD, NO BIT
58 11422 000005         5
59 11423 062677         IORST
60                      TRANSMIT        LOOPBACK,ODDPARITY,CODE6
```

```
 0122  PSID
01 11424 006155          JSR@    ITRMT
02 11425 100013 100000+LOOPBACK+ODDPARITY+CODE6
03                       DATACHECK       37,6
04                       CHARA   37,6
05 11426 006125          JSR@    ICHRA
06 11427 000037          37
07 11430 000026          4*6-2
08 11431 000022          2*6+2+(2*(8.-6))
09 11432 060434          DIA     0,MUX
10 11433 061434          DIB     0,MUX
11 11434 024271          LDA     1,C37
12 11435 122414          SUB#    1,0,SZR         ;DOES RECEIVE WORD MATCH?
13                       EHALT                   ;NO, CHECK TRANSMITTER AND
14 11436 006230          JSR@    IERR?
15 11437 006231          LOOPX                   ;RECEIVER BUFFERS, LC DECODING
16                                               ;PARITY GENERATOR
17
18 11440 006226 T057:    JSR@    IENT?           ;6 LEVEL, ODD, BIT GENERATED
19 11441 000005          5
20 11442 062677          IORST
21                       TRANSMIT        LOOPBACK,ODDPARITY,CODE6
22 11443 006155          JSR@    ITRMT
23 11444 100013 100000+LOOPBACK+ODDPARITY+CODE6
24                       CHARA   27,6
25 11445 006125          JSR@    ICHRA
26 11446 000027          27
27 11447 000026          4*6-2
28 11450 000022          2*6+2+(2*(8.-6))
29 11451 060434          DIA     0,MUX
30 11452 061434          DIB     0,MUX
31 11453 024274          LDA     1,C67
32 11454 122414          SUB#    1,0,SZR
33                       EHALT                   ;PARITY GENERATOR
34 11455 006230          JSR@    IERR?
35 11456 006231          LOOPX
36
37 11457 006226 T57A:    JSR@    IENT?           ;CHECK DATA10 BIT IS NOT
38 11460 000005          5
39 11461 062677          IORST
40                                               ;ALWAYS GENERATED ON PARITY
41                       TRANSMIT        LOOPBACK,ODDPARITY,CODE7
42 11462 006155          JSR@    ITRMT
43 11463 100023 100000+LOOPBACK+ODDPARITY+CODE7
44                       CHARA   27,7
45 11464 006125          JSR@    ICHRA
46 11465 000027          27
47 11466 000032          4*7-2
48 11467 000022          2*7+2+(2*(8.-7))
49 11470 060434          DIA     0,MUX
50 11471 061434          DIB     0,MUX
51 11472 024303          LDA     1,C127
52 11473 122414          SUB#    1,0,SZR
53                       EHALT                   ;DATA10 HIGH TO PARITY
54 11474 006230          JSR@    IERR?
55 11475 006231          LOOPX                   ;GATING
56               ;GENERATE PARITY ERRORS
57
58 11476 006226 T058:    JSR@    IENT?           ;8 LEVEL,EVEN PARITY
59 11477 000005          5
60 11500 062677          IORST
```

```
0123  PSID
01                          TRANSMIT        LOOPBACK,EVENPARITY,CODE8
02 11501 006155             JSR@    ITRMT
03 11502 100035 100000+LOOPBACK+EVENPARITY+CODE8
04                          STATUS          277,8.,C4
05                          CHARA   277,8.
06 11503 006125             JSR@    ICHRA
07 11504 000277             277
08 11505 000036             4*8.-2
09 11506 000022             2*8.+2+(2*(8.-8.))
10 11507 060434             DIA     0,MUX
11 11510 061434             DIB     0,MUX
12 11511 062434             DIC     0,MUX           ;INPUT STATUS WORD
13 11512 024240             LDA     1,C4            ;LOAD MASK
14 11513 123415             AND#    1,0,SNR         ;CHECK STATUS
15                          EHALT                   ;CHECK PARITY LOGIC
16 11514 006230             JSR@    IERR?
17 11515 006231             LOOPX                   ;OR RECEIVER OVERRUN
18
19 11516 006226 T059:       JSR@    IENT?           ;8 LEVEL, ODD PARITY
20 11517 000005             5
21 11520 062677             IORST
22                          TRANSMIT        LOOPBACK,ODDPARITY,CODE8
23 11521 006155             JSR@    ITRMT
24 11522 100033 100000+LOOPBACK+ODDPARITY+CODE8
25                          STATUS          377,8.,C4
26                          CHARA   377,8.
27 11523 006125             JSR@    ICHRA
28 11524 000377             377
29 11525 000036             4*8.-2
30 11526 000022             2*8.+2+(2*(8.-8.))
31 11527 060434             DIA     0,MUX
32 11530 061434             DIB     0,MUX
33 11531 062434             DIC     0,MUX           ;INPUT STATUS WORD
34 11532 024240             LDA     1,C4            ;LOAD MASK
35 11533 123415             AND#    1,0,SNR         ;CHECK STATUS
36                          EHALT                   ;CHECK PARITY LOGIC
37 11534 006230             JSR@    IERR?
38 11535 006231             LOOPX                   ;OR RECEIVER OVERRUN
39
40 11536 006226 T060:       JSR@    IENT?           ;7 LEVEL, EVEN PARITY
41 11537 000005             5
42 11540 062677             IORST
43                          TRANSMIT        LOOPBACK,EVENPARITY,CODE7
44 11541 006155             JSR@    ITRMT
45 11542 100025 100000+LOOPBACK+EVENPARITY+CODE7
46                          STATUS          177,7,C4
47                          CHARA   177,7
48 11543 006125             JSR@    ICHRA
49 11544 000177             177
50 11545 000032             4*7-2
51 11546 000022             2*7+2+(2*(8.-7))
52 11547 060434             DIA     0,MUX
53 11550 061434             DIB     0,MUX
54 11551 062434             DIC     0,MUX           ;INPUT STATUS WORD
55 11552 024240             LDA     1,C4            ;LOAD MASK
56 11553 123415             AND#    1,0,SNR         ;CHECK STATUS
57                          EHALT                   ;CHECK PARITY LOGIC
58 11554 006230             JSR@    IERR?
59 11555 006231             LOOPX                   ;OR RECEIVER OVERRUN
60 11556 006226 T061:       JSR@    IENT?           ;7 LEVEL, ODD PARITY
```

```
 0124  PSID
01 11557 000005          5
02 11560 062677          IORST
03                       TRANSMIT        LOOPBACK,ODDPARITY,CODE7
04 11561 006155          JSR@    ITRMT
05 11562 100023 100000+LOOPBACK+ODDPARITY+CODE7
06                       STATUS          167,7,C4
07                       CHARA   167,7
08 11563 006125          JSR@    ICHRA
09 11564 000167          167
10 11565 000032          4*7-2
11 11566 000022          2*7+2+(2*(8.-7))
12 11567 060434          DIA     0,MUX
13 11570 061434          DIB     0,MUX
14 11571 062434          DIC     0,MUX           ;INPUT STATUS WORD
15 11572 024240          LDA     1,C4            ;LOAD MASK
16 11573 123415          AND#    1,0,SNR         ;CHECK STATUS
17                       EHALT                   ;CHECK PARITY LOGIC
18 11574 006230          JSR@    IERR?
19 11575 006231          LOOPX                   ;OR RECEIVER OVERRUN
20
21 11576 006226 T062:    JSR@    IENT?           ;6 LEVEL, EVEN PARITY
22 11577 000005          5
23 11600 062677          IORST
24                       TRANSMIT        LOOPBACK,EVENPARITY,CODE6
25 11601 006155          JSR@    ITRMT
26 11602 100015 100000+LOOPBACK+EVENPARITY+CODE6
27                       STATUS          67,6,C4
28                       CHARA   67,6
29 11603 006125          JSR@    ICHRA
30 11604 000067          67
31 11605 000026          4*6-2
32 11606 000022          2*6+2+(2*(8.-6))
33 11607 060434          DIA     0,MUX
34 11610 061434          DIB     0,MUX
35 11611 062434          DIC     0,MUX           ;INPUT STATUS WORD
36 11612 024240          LDA     1,C4            ;LOAD MASK
37 11613 123415          AND#    1,0,SNR         ;CHECK STATUS
38                       EHALT                   ;CHECK PARITY LOGIC
39 11614 006230          JSR@    IERR?
40 11615 006231          LOOPX                   ;OR RECEIVER OVERRUN
41 11616 006226 T063:    JSR@    IENT?           ;6 LEVEL, ODD PARITY
42 11617 000005          5
43 11620 062677          IORST
44                       TRANSMIT        LOOPBACK,ODDPARITY,CODE6
45 11621 006155          JSR@    ITRMT
46 11622 100013 100000+LOOPBACK+ODDPARITY+CODE6
47                       STATUS          77,6,C4
48                       CHARA   77,6
49 11623 006125          JSR@    ICHRA
50 11624 000077          77
51 11625 000026          4*6-2
52 11626 000022          2*6+2+(2*(8.-6))
53 11627 060434          DIA     0,MUX
54 11630 061434          DIB     0,MUX
55 11631 062434          DIC     0,MUX           ;INPUT STATUS WORD
56 11632 024240          LDA     1,C4            ;LOAD MASK
57 11633 123415          AND#    1,0,SNR         ;CHECK STATUS
58                       EHALT                   ;CHECK PARITY LOGIC
59 11634 006230          JSR@    IERR?
60 11635 006231          LOOPX                   ;OR RECEIVER OVERRUN
```

```
 0125  PSID
01
02 11636 006226 T63A:   JSR@    IENT?           ;CHECK PARITY ERROR INPUT
03 11637 000005         5
04 11640 062677         IORST
05                                              ;WITHOUT MUX BD DINC
06                      TRANSMIT        LOOPBACK,ODDPARITY,CODE6
07 11641 006155         JSR@    ITRMT
08 11642 100013 100000+LOOPBACK+ODDPARITY+CODE6
09                      CHARA   53,6
10 11643 006125         JSR@    ICHRA
11 11644 000053         53
12 11645 000026         4*6-2
13 11646 000022         2*6+2+(2*(8.-6))
14 11647 060434         DIA     0,MUX
15 11650 061434         DIB     0,MUX
16 11651 024240         LDA     1,C4
17 11652 123414         AND#    1,0,SZR
18                      EHALT                   ;DIC O.C. GATE (PARER)
19 11653 006230         JSR@    IERR?
20 11654 006231         LOOPX
21              ;CHECK REMAINING BITS OF PARITY GENERATOR
22              ;FOR HIGH OR FLOATING INPUTS
23
24 11655 006226 T064:   JSR@    IENT?           ;DATA11
25 11656 000005         5
26 11657 062677         IORST
27                      TRANSMIT        LOOPBACK,EVENPARITY,CODE8
28 11660 006155         JSR@    ITRMT
29 11661 100035 100000+LOOPBACK+EVENPARITY+CODE8
30                      STATUS  357,8.,C4
31                      CHARA   357,8.
32 11662 006125         JSR@    ICHRA
33 11663 000357         357
34 11664 000036         4*8.-2
35 11665 000022         2*8.+2+(2*(8.-8.))
36 11666 060434         DIA     0,MUX
37 11667 061434         DIB     0,MUX
38 11670 062434         DIC     0,MUX           ;INPUT STATUS WORD
39 11671 024240         LDA     1,C4            ;LOAD MASK
40 11672 123415         AND#    1,0,SNR         ;CHECK STATUS
41                      EHALT                   ;CHECK PARITY LOGIC
42 11673 006230         JSR@    IERR?
43 11674 006231         LOOPX                   ;OR RECEIVER OVERRUN
44
45 11675 006226 T64A:   JSR@    IENT?           ;DATA13
46 11676 000005         5
47 11677 062677         IORST
48                      TRANSMIT        LOOPBACK,EVENPARITY,CODE8
49 11700 006155         JSR@    ITRMT
50 11701 100035 100000+LOOPBACK+EVENPARITY+CODE8
51                      STATUS  373,8.,C4
52                      CHARA   373,8.
53 11702 006125         JSR@    ICHRA
54 11703 000373         373
55 11704 000036         4*8.-2
56 11705 000022         2*8.+2+(2*(8.-8.))
57 11706 060434         DIA     0,MUX
58 11707 061434         DIB     0,MUX
59 11710 062434         DIC     0,MUX           ;INPUT STATUS WORD
60 11711 024240         LDA     1,C4            ;LOAD MASK
```

```
 0126  PSID
01 11712 123415          AND#    1,0,SNR          ;CHECK STATUS
02                       EHALT                    ;CHECK PARITY LOGIC
03 11713 006230          JSR@    IERR?
04 11714 006231          LOOPX                    ;OR RECEIVER OVERRUN
05 11715 006226 T64B:    JSR@    IENT?            ;DATA14
06 11716 000005          5
07 11717 062677          IORST
08                       TRANSMIT        LOOPBACK,EVENPARITY,CODE8
09 11720 006155          JSR@    ITRMT
10 11721 100035 100000+LOOPBACK+EVENPARITY+CODE8
11                       STATUS  375,8.,C4
12                       CHARA   375,8.
13 11722 006125          JSR@    ICHRA
14 11723 000375          375
15 11724 000036          4*8.-2
16 11725 000022          2*8.+2+(2*(8.-8.))
17 11726 060434          DIA     0,MUX
18 11727 061434          DIB     0,MUX
19 11730 062434          DIC     0,MUX            ;INPUT STATUS WORD
20 11731 024240          LDA     1,C4             ;LOAD MASK
21 11732 123415          AND#    1,0,SNR          ;CHECK STATUS
22                       EHALT                    ;CHECK PARITY LOGIC
23 11733 006230          JSR@    IERR?
24 11734 006231          LOOPX                    ;OR RECEIVER OVERRUN
25
26 11735 006226 T64C:    JSR@    IENT?            ;DATA15
27 11736 000005          5
28 11737 062677          IORST
29                       TRANSMIT        LOOPBACK,EVENPARITY,CODE8
30 11740 006155          JSR@    ITRMT
31 11741 100035 100000+LOOPBACK+EVENPARITY+CODE8
32                       STATUS  376,8.,C4
33                       CHARA   376,8.
34 11742 006125          JSR@    ICHRA
35 11743 000376          376
36 11744 000036          4*8.-2
37 11745 000022          2*8.+2+(2*(8.-8.))
38 11746 060434          DIA     0,MUX
39 11747 061434          DIB     0,MUX
40 11750 062434          DIC     0,MUX            ;INPUT STATUS WORD
41 11751 024240          LDA     1,C4             ;LOAD MASK
42 11752 123415          AND#    1,0,SNR          ;CHECK STATUS
43                       EHALT                    ;CHECK PARITY LOGIC
44 11753 006230          JSR@    IERR?
45 11754 006231          LOOPX                    ;OR RECEIVER OVERRUN
46 11755 006226 T64D:    JSR@    IENT?            ;GENERATE PARITY ERROR
47 11756 000005          5
48 11757 062677          IORST
49                                                ;AND CHECK -(GENPAR) ALWAYS
50                                                ;DRIVING BUS
51                       TRANSMIT        LOOPBACK,EVENPARITY,CODE8
52 11760 006155          JSR@    ITRMT
53 11761 100035 100000+LOOPBACK+EVENPARITY+CODE8
54                       CHARA   376,8.
55 11762 006125          JSR@    ICHRA
56 11763 000376          376
57 11764 000036          4*8.-2
58 11765 000022          2*8.+2+(2*(8.-8.))
59 11766 060434          DIA     0,MUX            ;DATA8 WILL BE DRIVEN ON
60 11767 061434          DIB     0,MUX            ;A DIC MUX BD SEL IF GENPAR
```

```
 0127  PSID
01 11770 062434          DIC     0,MUX           ;IS ALWAYS TRUE TO ENABLE
02 11771 024307          LDA     1,C200          ;GATES OF PARITY- MASK OUT
03 11772 123414          AND#    1,0,SZR         ;PARITY ERROR BIT
04                       EHALT                   ;-(GENPAR) ALWAYS
05 11773 006230          JSR@    IERR?
06 11774 006231          LOOPX                   ;ENABLING PARITY BUS
07 11775 006226 T065:    JSR@    IENT?           ;CREATE OVERRUN ON RECEIVER
08 11776 000005          5
09 11777 062677          IORST
10                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
11 12000 006155          JSR@    ITRMT
12 12001 100031 100000+LOOPBACK+NOPARITY+CODE8
13                       XCLK    C1
14 12002 020235          LDA     0,C1
15 12003 006123          JSR     @.STEP
16                       RECEIVER
17 12004 020101          LDA     0,RECADR
18 12005 061034          DOA     0,MUX           ;ENABLE RECEIVER
19 12006 126520          SUBZL   1,1
20 12007 067034          DOC     1,MUX           ;START RECEIVER
21                       MUXCLKA C1
22 12010 020235          LDA     0,C1
23 12011 006121          JSR     @ICONT
24                       X.CLK   30.
25 12012 030363          LDA     2,CM30.
26                       XCLK    C1
27 12013 020235          LDA     0,C1
28 12014 006123          JSR     @.STEP
29                       MUXCLKA C5
30 12015 020241          LDA     0,C5
31 12016 006121          JSR     @ICONT
32 12017 151404          INC     2,2,SZR
33 12020 000773          JMP     .-5
34 12021 024302          LDA     1,C125          ;TRANSMIT ONCE
35 12022 066034          DOB     1,MUX
36                       X.CLK   16.
37 12023 030355          LDA     2,CM16.
38                       XCLK    C1
39 12024 020235          LDA     0,C1
40 12025 006123          JSR     @.STEP
41                       MUXCLKA C5
42 12026 020241          LDA     0,C5
43 12027 006121          JSR     @ICONT
44 12030 151404          INC     2,2,SZR
45 12031 000773          JMP     .-5
46 12032 024302          LDA     1,C125
47 12033 066034          DOB     1,MUX           ;TRANSMIT AGAIN
48                       X.CLK   18.
49 12034 030362          LDA     2,CM18.
50                       XCLK    C1
51 12035 020235          LDA     0,C1
52 12036 006123          JSR     @.STEP
53                       MUXCLKA C5
54 12037 020241          LDA     0,C5
55 12040 006121          JSR     @ICONT
56 12041 151404          INC     2,2,SZR
57 12042 000773          JMP     .-5
58 12043 060434          DIA     0,MUX
59 12044 061434          DIB     0,MUX
60 12045 062434          DIC     0,MUX
```

```
 0128  PSID
01 12046 024236          LDA     1,C2
02 12047 123415          AND#    1,0,SNR
03                       EHALT                   ;CHECK OVERRUN FROM RECEIVER,
04 12050 006230          JSR@    IERR?
05 12051 006231          LOOPX                   ;DIC INPUT REGISTER
06
07 12052 006226 T65B:    JSR@    IENT?           ;CHECK OVERRUN INPUT
08 12053 000005          5
09 12054 062677          IORST
10                                               ;WITHOUT MUX BD DINC
11                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
12 12055 006155          JSR@    ITRMT
13 12056 100031 100000+LOOPBACK+NOPARITY+CODE8
14                       XCLK    C1
15 12057 020235          LDA     0,C1
16 12060 006123          JSR     @.STEP
17                       RECEIVER
18 12061 020101          LDA     0,RECADR
19 12062 061034          DOA     0,MUX           ;ENABLE RECEIVER
20 12063 126520          SUBZL   1,1
21 12064 067034          DOC     1,MUX           ;START RECEIVER
22                       MUXCLKA C1
23 12065 020235          LDA     0,C1
24 12066 006121          JSR     @ICONT
25                       X.CLK   30.
26 12067 030363          LDA     2,CM30.
27                       XCLK    C1
28 12070 020235          LDA     0,C1
29 12071 006123          JSR     @.STEP
30                       MUXCLKA C5
31 12072 020241          LDA     0,C5
32 12073 006121          JSR     @ICONT
33 12074 151404          INC     2,2,SZR
34 12075 000773          JMP     .-5
35 12076 024302          LDA     1,C125
36 12077 066034          DOB     1,MUX
37                       X.CLK   16.
38 12100 030355          LDA     2,CM16.
39                       XCLK    C1
40 12101 020235          LDA     0,C1
41 12102 006123          JSR     @.STEP
42                       MUXCLKA C5
43 12103 020241          LDA     0,C5
44 12104 006121          JSR     @ICONT
45 12105 151404          INC     2,2,SZR
46 12106 000773          JMP     .-5
47 12107 024302          LDA     1,C125
48 12110 066034          DOB     1,MUX
49                       X.CLK   18.
50 12111 030362          LDA     2,CM18.
51                       XCLK    C1
52 12112 020235          LDA     0,C1
53 12113 006123          JSR     @.STEP
54                       MUXCLKA C5
55 12114 020241          LDA     0,C5
56 12115 006121          JSR     @ICONT
57 12116 151404          INC     2,2,SZR
58 12117 000773          JMP     .-5
59 12120 060434          DIA     0,MUX
60 12121 061434          DIB     0,MUX
```

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 0129  PSID
01 12122 060034          NIO     MUX
02 12123 024236          LDA     1,C2
03 12124 123414          AND#    1,0,SZR
04                       EHALT                   ;MUX BD DINC O.C. GATE (OVERRUN)
05 12125 006230          JSR@    IERR?
06 12126 006231          LOOPX
07                                               ;XMIT AND RECEIVE A  CHARACTER
08               T066:   SYNC    SY026           ;ONLINE
09 12127 006226          JSR@    IENT?
10 12130 000005          5
11 12131 062677          IORST
12                       ADROUT
13 12132 030101          LDA     2,RECADR        ;ADDRESS CORRECT
14 12133 071034          DOA     2,MUX           ;BOARD
15 12134 020365          LDA     0,SY026
16 12135 063034          DOC     0,MUX
17 12136 151400          INC     2,2
18 12137 071034          DOA     2,MUX
19 12140 063034          DOC     0,MUX
20                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
21 12141 006155          JSR@    ITRMT
22 12142 100031 100000+LOOPBACK+NOPARITY+CODE8
23 12143 020101          LDA     0,RECADR
24 12144 061034          DOA     0,MUX
25 12145 126520          SUBZL   1,1
26 12146 067234          DOCC    1,MUX
27 12147 125404          INC     1,1,SZR
28 12150 000777          JMP     .-1
29 12151 060634          DIAC    0,MUX
30 12152 066034          DOB     1,MUX
31 12153 102400          SUB     0,0
32 12154 101404          INC     0,0,SZR
33 12155 000777          JMP     .-1             ;DELAY LOOPX
34 12156 060434          DIA     0,MUX
35 12157 101232          MOVZR#  0,0,SZC
36                       EHALT
37 12160 006230          JSR@    IERR?
38 12161 006231          LOOPX                   ;ONLINE TO XMIT CLOCK
39 12162 000401          JMP     T067
40 12163 006226 T067:    JSR@    IENT?           ;DOES RCV-DN GET RESET?
41 12164 000005          5
42 12165 062677          IORST
43                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
44 12166 006155          JSR@    ITRMT
45 12167 100031 100000+LOOPBACK+NOPARITY+CODE8
46 12170 020101          LDA     0,RECADR
47 12171 061034          DOA     0,MUX
48 12172 126520          SUBZL   1,1
49 12173 067234          DOCC    1,MUX
50 12174 125404          INC     1,1,SZR
51 12175 000777          JMP     .-1
52 12176 060434          DIA     0,MUX
53 12177 066234          DOBC    1,MUX
54 12200 101000          MOV     0,0
55 12201 063634          SKPDN   MUX             ;WAIT FOR RECEIVER TO SET DONE
56 12202 000777          JMP     .-1
57 12203 060434          DIA     0,MUX           ;CLEAR RECEIVE DONE- DOES
58 12204 101222          MOVZR   0,0,SZC
59 12205 000772          JMP     .-6
60 12206 061634          DIBC    0,MUX           ;"DIB" CLEARS RECEIVER
```

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 0130  PSID
01 12207 063634          SKPDN   MUX             ;WAIT FOR DONE TO SET AGAIN
02 12210 000777          JMP     .-1
03 12211 060434          DIA     0,MUX
04 12212 101233          MOVZR#  0,0,SNC         ;SHOULD BE XMIT DONE
05                       EHALT                   ;YES- -(REC) DOES NOT
06 12213 006230          JSR@    IERR?
07 12214 006231          LOOPX                   ;RESET -(RCV-DN)
08 12215 006226 T068:    JSR@    IENT?           ;DOES OVERRUN GET RESET?
09 12216 000005          5
10 12217 062677          IORST
11                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
12 12220 006155          JSR@    ITRMT
13 12221 100031 100000+LOOPBACK+NOPARITY+CODE8
14 12222 020101          LDA     0,RECADR
15 12223 061034          DOA     0,MUX
16 12224 126520          SUBZL   1,1
17 12225 067234          DOCC    1,MUX
18 12226 125404          INC     1,1,SZR
19 12227 000777          JMP     .-1
20 12230 060434          DIA     0,MUX
21 12231 066234          DOBC    1,MUX
22 12232 063634          SKPDN   MUX             ;WAIT FOR RECEIVE INTERRUPT
23 12233 000777          JMP     .-1
24 12234 060434          DIA     0,MUX
25 12235 101222          MOVZR   0,0,SZC
26 12236 000773          JMP     .-5
27 12237 060634          DIAC    0,MUX
28 12240 125404          INC     1,1,SZR
29 12241 000777          JMP     .-1
30 12242 063634          SKPDN   MUX
31 12243 000777          JMP     .-1
32 12244 060534          DIAS    0,MUX           ; RESET  RECEIVER
33 12245 061434          DIB     0,MUX
34 12246 062434          DIC     0,MUX
35 12247 024236          LDA     1,C2
36 12250 123414          AND#    1,0,SZR
37                       EHALT                   ;-(RECO) TO OVERRUN
38 12251 006230          JSR@    IERR?
39 12252 006231          LOOPX
40 12253 006226 T069:    JSR@    IENT?           ;CHECK LATCH ONLINE
41 12254 000005          5
42 12255 062677          IORST
43 12256 020102          LDA     0,TRADR
44 12257 061234          DOAC    0,MUX           ;GO ON LINE
45                       LCS     LOOPBACK,NOPARITY,CODE8
46 12260 006120          JSR     @.LINCH         ;OUTPUT LINE CHARACTERISTICS
47 12261 100031          100000+LOOPBACK+NOPARITY+CODE8
48 12262 102520          SUBZL   0,0
49 12263 063034          DOC     0,MUX           ;START TRANSMITTER
50                       RECEIVER
51 12264 020101          LDA     0,RECADR
52 12265 061034          DOA     0,MUX           ;ENABLE RECEIVER
53 12266 126520          SUBZL   1,1
54 12267 067034          DOC     1,MUX           ;START RECEIVER
55 12270 125404          INC     1,1,SZR
56 12271 000777          JMP     .-1
57 12272 060634          DIAC    0,MUX
58 12273 024302          LDA     1,C125
59 12274 066034          DOB     1,MUX
60 12275 063634          SKPDN   MUX
```

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 0131  PSID
01 12276 000777          JMP     .-1
02 12277 060434          DIA     0,MUX
03 12300 101222          MOVZR   0,0,SZC
04 12301 000774          JMP     .-4
05 12302 020102          LDA     0,TRADR
06 12303 061034          DOA     0,MUX
07 12304 102400          SUB     0,0
08 12305 063034          DOC     0,MUX
09 12306 020241          LDA     0,C5
10 12307 040100          STA     0,TEMP
11 12310 024302          LDA     1,C125
12 12311 061434          DIB     0,MUX
13 12312 122414          SUB#    1,0,SZR
14                       EHALT                   ;LATCH IS ALWAYS ON, OR
15 12313 006230          JSR@    IERR?
16 12314 014100          DSZ     TEMP            ;NEVER ON
17 12315 000774          JMP     .-4
18 12316 006231          LOOPX
19 12317 006226 T070:    JSR@    IENT?           ;CHECK PARITY IS GENERATED
20 12320 000005          5
21 12321 062677          IORST
22                       ADROUT                  ;WHEN SYNC WORD IS OUTPUTTED
23 12322 030101          LDA     2,RECADR        ;ADDRESS CORRECT
24 12323 071034          DOA     2,MUX           ;BOARD
25                       LCS     LOOPBACK,EVENPARITY,CODE8
26 12324 006120          JSR     @.LINCH         ;OUTPUT LINE CHARACTERISTICS
27 12325 100035          100000+LOOPBACK+EVENPARITY+CODE8
28 12326 020336          LDA     0,C40026        ;THIS SYNC WORD WILL SET PARITY BIT
29 12327 063034          DOC     0,MUX
30 12330 151400          INC     2,2
31 12331 071034          DOA     2,MUX
32 12332 063034          DOC     0,MUX
33                       TRANSMIT        LOOPBACK,EVENPARITY,CODE8
34 12333 006155          JSR@    ITRMT
35 12334 100035 100000+LOOPBACK+EVENPARITY+CODE8
36                       XCLK    C1
37 12335 020235          LDA     0,C1
38 12336 006123          JSR     @.STEP
39                       RECEIVER
40 12337 020101          LDA     0,RECADR
41 12340 061034          DOA     0,MUX           ;ENABLE RECEIVER
42 12341 126520          SUBZL   1,1
43 12342 067034          DOC     1,MUX           ;START RECEIVER
44                       MUXCLKA C1
45 12343 020235          LDA     0,C1
46 12344 006121          JSR     @ICONT
47 12345 024265          LDA     1,C26           ;TRANSMIT SYNC WORD
48 12346 066034          DOB     1,MUX
49                       X.CLK   14.
50 12347 030354          LDA     2,CM14.
51                       XCLK    C1
52 12350 020235          LDA     0,C1
53 12351 006123          JSR     @.STEP
54                       MUXCLKA C5
55 12352 020241          LDA     0,C5
56 12353 006121          JSR     @ICONT
57 12354 151404          INC     2,2,SZR
58 12355 000773          JMP     .-5
59 12356 024265          LDA     1,C26           ;AGAIN
60 12357 066034          DOB     1,MUX
```

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 0132  PSID
01                          X.CLK   16.
02 12360 030355             LDA     2,CM16.
03                          XCLK    C1
04 12361 020235             LDA     0,C1
05 12362 006123             JSR     @.STEP
06                          MUXCLKA C5
07 12363 020241             LDA     0,C5
08 12364 006121             JSR     @ICONT
09 12365 151404             INC     2,2,SZR
10 12366 000773             JMP     .-5
11 12367 024306             LDA     1,C177          ;NORMAL DATA
12 12370 066034             DOB     1,MUX
13                          X.CLK   18.             ;IF GENPAR WENT TRUE, THEN
14 12371 030362             LDA     2,CM18.
15                          XCLK    C1
16 12372 020235             LDA     0,C1
17 12373 006123             JSR     @.STEP
18                          MUXCLKA C5
19 12374 020241             LDA     0,C5
20 12375 006121             JSR     @ICONT
21 12376 151404             INC     2,2,SZR
22 12377 000773             JMP     .-5
23 12400 060434             DIA     0,MUX           ;DONE SHOULD SET FOR RECVR
24 12401 101232             MOVZR#  0,0,SZC
25                          EHALT                   ;-(GENPAR) TO PARITY
26 12402 006230             JSR@    IERR?
27 12403 006231             LOOPX                   ;LOGIC, DOC ROM
28 12404 006226 T071:       JSR@    IENT?           ;TEST GENPAR FOR DLE WORD
29 12405 000005             5
30 12406 062677             IORST
31                          ADROUT
32 12407 030101             LDA     2,RECADR        ;ADDRESS CORRECT
33 12410 071034             DOA     2,MUX           ;BOARD
34                          TRANSMIT        LOOPBACK,EVENPARITY,CODE8
35 12411 006155             JSR@    ITRMT
36 12412 100035 100000+LOOPBACK+EVENPARITY+CODE8
37 12413 020454             LDA     0,C1.413                ;THIS GENERATES PARITY BIT
38 12414 063034             DOC     0,MUX
39                          XCLK    C1
40 12415 020235             LDA     0,C1
41 12416 006123             JSR     @.STEP
42                          RECEIVER
43 12417 020101             LDA     0,RECADR
44 12420 061034             DOA     0,MUX           ;ENABLE RECEIVER
45 12421 126520             SUBZL   1,1
46 12422 067034             DOC     1,MUX           ;START RECEIVER
47                          MUXCLKA C1
48 12423 020235             LDA     0,C1
49 12424 006121             JSR     @ICONT
50 12425 024265             LDA     1,C26           ;SYNC WORD
51 12426 066034             DOB     1,MUX
52                          X.CLK   14.
53 12427 030354             LDA     2,CM14.
54                          XCLK    C1
55 12430 020235             LDA     0,C1
56 12431 006123             JSR     @.STEP
57                          MUXCLKA C5
58 12432 020241             LDA     0,C5
59 12433 006121             JSR     @ICONT
60 12434 151404             INC     2,2,SZR
```

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 0133  PSID
01 12435 000773          JMP     .-5
02 12436 024265          LDA     1,C26           ;AGAIN
03 12437 066034          DOB     1,MUX
04                       X.CLK   16.
05 12440 030355          LDA     2,CM16.
06                       XCLK    C1
07 12441 020235          LDA     0,C1
08 12442 006123          JSR     @.STEP
09                       MUXCLKA C5
10 12443 020241          LDA     0,C5
11 12444 006121          JSR     @ICONT
12 12445 151404          INC     2,2,SZR
13 12446 000773          JMP     .-5
14 12447 024421          LDA     1,C3.017        ;XMIT AND ENTER XPARENCY
15 12450 066034          DOB     1,MUX
16                       X.CLK   18.             ;TRANSMITTER OUTPUTTED DLE,
17 12451 030362          LDA     2,CM18.
18                       XCLK    C1
19 12452 020235          LDA     0,C1
20 12453 006123          JSR     @.STEP
21                       MUXCLKA C5
22 12454 020241          LDA     0,C5
23 12455 006121          JSR     @ICONT
24 12456 151404          INC     2,2,SZR
25 12457 000773          JMP     .-5
26 12460 060434          DIA     0,MUX           ;IT SHOULD HAVE PARITY BIT ON IT
27 12461 065434          DIB     1,MUX
28 12462 020310          LDA     0,C213
29 12463 122414          SUB#    1,0,SZR
30                       EHALT                   ;-(GENPAR) TO PARITY LOGIC
31 12464 006230          JSR@    IERR?
32 12465 006231          LOOPX                   ;DOC ROM
33 12466 000404          JMP     T072
34 12467 140013 C1.413:  140013
35 12470 030177 C3.017:  30177
36 12471 040000 C40K:    40000
37 12472 006226 T072:    JSR@    IENT?           ;CHECK BDEN IS NOT
38 12473 000005          5
39 12474 062677          IORST
40 12475 030101          LDA     2,RECADR        ;ALWAYS SET BY LOADING
41 12476 024272          LDA     1,C40           ;NEW SYNC WORD TO ANOTHER
42 12477 133000          ADD     1,2             ;BOARD AND VERIFYING IT DID NOT
43 12500 071034          DOA     2,MUX           ;GET TO THIS ONE.
44 12501 020770          LDA     0,C40K          ;PRESENT SYNC WORD IS "026"
45 12502 063034          DOC     0,MUX           ;NEW "FAKE" ONE IS "0"
46 12503 151400          INC     2,2
47 12504 071034          DOA     2,MUX
48 12505 063034          DOC     0,MUX
49                       ADROUT
50 12506 030101          LDA     2,RECADR        ;ADDRESS CORRECT
51 12507 071034          DOA     2,MUX           ;BOARD
52                       TRANSMIT        LOOPBACK,NOPARITY,CODE8
53 12510 006155          JSR@    ITRMT
54 12511 100031 100000+LOOPBACK+NOPARITY+CODE8
55                       XCLK    C1
56 12512 020235          LDA     0,C1
57 12513 006123          JSR     @.STEP
58                       RECEIVER
59 12514 020101          LDA     0,RECADR
60 12515 061034          DOA     0,MUX           ;ENABLE RECEIVER
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 0134  PSID
01 12516 126520          SUBZL   1,1
02 12517 067034          DOC     1,MUX           ;START RECEIVER
03                       MUXCLKA C1
04 12520 020235          LDA     0,C1
05 12521 006121          JSR     @ICONT
06                       X.CLK   30.
07 12522 030363          LDA     2,CM30.
08                       XCLK    C1
09 12523 020235          LDA     0,C1
10 12524 006123          JSR     @.STEP
11                       MUXCLKA C5
12 12525 020241          LDA     0,C5
13 12526 006121          JSR     @ICONT
14 12527 151404          INC     2,2,SZR
15 12530 000773          JMP     .-5
16 12531 126520          SUBZL   1,1             ;XMIT CHAR. IS 1
17 12532 066034          DOB     1,MUX
18                       X.CLK   18.
19 12533 030362          LDA     2,CM18.
20                       XCLK    C1
21 12534 020235          LDA     0,C1
22 12535 006123          JSR     @.STEP
23                       MUXCLKA C5
24 12536 020241          LDA     0,C5
25 12537 006121          JSR     @ICONT
26 12540 151404          INC     2,2,SZR
27 12541 000773          JMP     .-5
28 12542 060434          DIA     0,MUX
29 12543 024101          LDA     1,RECADR
30 12544 122414          SUB#    1,0,SZR
31                       EHALT                   ;BDEN ALWAYS SET FOR THIS BOARD
32 12545 006230          JSR@    IERR?
33 12546 006231          LOOPX
34              ;MODEM TESTING
35
36 12547 006226 M000:    JSR@    IENT?           ;DOES DONE SET WHEN
37 12550 000005          5
38 12551 062677          IORST
39                       ADROUT                  ;CLOCK IS RUN?
40 12552 030101          LDA     2,RECADR        ;ADDRESS CORRECT
41 12553 071034          DOA     2,MUX           ;BOARD
42                       MUXCLKA C4
43 12554 020240          LDA     0,C4
44 12555 006121          JSR     @ICONT
45 12556 063734          SKPDZ   MUX
46                       EHALT                   ;YES, CHECK MUX CLKA TO MDM DN
47 12557 006230          JSR@    IERR?
48 12560 006231          LOOPX                   ;FLOP- MODEM STORAGE LOGIC
49
50 12561 006226 M002:    JSR@    IENT?           ;SET DONE WITH MODEM
51 12562 000005          5
52 12563 062677          IORST
53                       MODEM   DTR             ;DTR SIGNAL
54 12564 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
55 12565 061034          DOA     0,MUX           ;WORD
56 12566 024066          LDA     1,DTR
57 12567 066034          DOB     1,MUX
58                       MUXCLKA C4
59 12570 020240          LDA     0,C4
60 12571 006121          JSR     @ICONT
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 0135  PSID
01 12572 063634          SKPDN   MUX
02                       EHALT                   ;CHECK MDM DN, PRIORITY
03 12573 006230          JSR@    IERR?
04 12574 006231          LOOPX                   ;LOGIC MODEM COMPARATOR
05
06 12575 006226 M02A:    JSR@    IENT?           ;CHECK THAT DONE STAYS SET
07 12576 000005          5
08 12577 062677          IORST
09                       MODEM   OFF
10 12600 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
11 12601 061034          DOA     0,MUX           ;WORD
12 12602 024067          LDA     1,OFF
13 12603 066034          DOB     1,MUX
14 12604 062677          IORST
15                       MODEM   DTR
16 12605 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
17 12606 061034          DOA     0,MUX           ;WORD
18 12607 024066          LDA     1,DTR
19 12610 066034          DOB     1,MUX
20                       MUXCLKA C4
21 12611 020240          LDA     0,C4
22 12612 006121          JSR     @ICONT
23 12613 063634          SKPDN   MUX
24                       EHALT                   ;MODEM DONE FLOP NOT LATCHED
25 12614 006230          JSR@    IERR?
26 12615 006231          LOOPX
27
28 12616 006226 M003:    JSR@    IENT?           ;MAKE SURE THAT MODEM DONE IS
29 12617 000005          5
30 12620 062677          IORST
31                       MODEM   DTR             ;RESET
32 12621 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
33 12622 061034          DOA     0,MUX           ;WORD
34 12623 024066          LDA     1,DTR
35 12624 066034          DOB     1,MUX
36                       MUXCLKA C1
37 12625 020235          LDA     0,C1
38 12626 006121          JSR     @ICONT
39                       MODEM   OFF
40 12627 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
41 12630 061034          DOA     0,MUX           ;WORD
42 12631 024067          LDA     1,OFF
43 12632 066034          DOB     1,MUX
44 12633 062677          IORST
45                       ADROUT
46 12634 030101          LDA     2,RECADR        ;ADDRESS CORRECT
47 12635 071034          DOA     2,MUX           ;BOARD
48                       MUXCLKA C4
49 12636 020240          LDA     0,C4
50 12637 006121          JSR     @ICONT
51 12640 063734          SKPDZ   MUX
52                       EHALT                   ;-(RESET) TO MDM DN
53 12641 006230          JSR@    IERR?
54 12642 006231          LOOPX
55
56 12643 006226 M004:    JSR@    IENT?           ;CHECK MODEM BIT IN
57 12644 000005          5
58 12645 062677          IORST
59                       MODEM   DTR             ;DIC WORD IS SET
60 12646 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
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 0136  PSID
01 12647 061034          DOA     0,MUX           ;WORD
02 12650 024066          LDA     1,DTR
03 12651 066034          DOB     1,MUX
04                       MUXCLKA C4
05 12652 020240          LDA     0,C4
06 12653 006121          JSR     @ICONT
07 12654 060434          DIA     0,MUX
08 12655 062434          DIC     0,MUX
09 12656 101233          MOVZR#  0,0,SNC
10                       EHALT                   ;CHECK MUX BD DINC, MODEM BIT,
11 12657 006230          JSR@    IERR?
12 12660 006231          LOOPX                   ;O.C. GATE
13 12661 006226 M04A:    JSR@    IENT?           ;CHECK MODEM INPUT
14 12662 000005          5
15 12663 062677          IORST
16                       MODEM   OFF             ;WITHOUT MUX BD DINC
17 12664 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
18 12665 061034          DOA     0,MUX           ;WORD
19 12666 024067          LDA     1,OFF
20 12667 066034          DOB     1,MUX
21 12670 062677          IORST
22                       MODEM   DTR
23 12671 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
24 12672 061034          DOA     0,MUX           ;WORD
25 12673 024066          LDA     1,DTR
26 12674 066034          DOB     1,MUX
27                       MUXCLKA C4
28 12675 020240          LDA     0,C4
29 12676 006121          JSR     @ICONT
30 12677 060434          DIA     0,MUX
31 12700 061434          DIB     0,MUX
32 12701 101232          MOVZR#  0,0,SZC
33                       EHALT                   ;MUX BD DINC O.C. GATE (BIT 15)
34 12702 006230          JSR@    IERR?
```

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!0137  PSID
01 12703 006231          LOOPX
02
03 12704 006226 M005:    JSR@    IENT?          ;CHECK RING (AND CTS IF PSI/U) IS SET
04 12705 000005          5
05 12706 062677          IORST
06                       MODEM   OFF
07 12707 020101          LDA     0,RECADR       ;OUTPUT MODEM CONTROL
08 12710 061034          DOA     0,MUX          ;WORD
09 12711 024067          LDA     1,OFF
10 12712 066034          DOB     1,MUX
11 12713 062677          IORST
12                       MODEM   DTR
13 12714 020101          LDA     0,RECADR       ;OUTPUT MODEM CONTROL
14 12715 061034          DOA     0,MUX          ;WORD
15 12716 024066          LDA     1,DTR
16 12717 066034          DOB     1,MUX
17                       MUXCLKA C4
18 12720 020240          LDA     0,C4
19 12721 006121          JSR     @ICONT
20 12722 060434          DIA     0,MUX
21 12723 062434          DIC     0,MUX
22 12724 024237          LDA     1,C3
23 12725 030117          LDA     2,UFLAG
24 12726 151005          MOV     2,2,SNR                ;PSI/U?
25 12727 024260          LDA     1,C13                  ;YES, INCLUDE CTS WITH RING AND MODEM
26 12730 122414          SUB#    1,0,SZR
27                       EHALT                  ;RING INPUT GATE, MODEM
28 12731 006230          JSR@    IERR?
29 12732 006231          LOOPX                  ;MEMORY, MUX BD DINC O.C. GATE
30
31 12733 006226 M006:    JSR@    IENT?          ;MAKE SURE MODEM MEMORY IS
32 12734 000005          5
33 12735 062677          IORST
34                       MODEM   DTR            ;RESET
35 12736 020101          LDA     0,RECADR       ;OUTPUT MODEM CONTROL
36 12737 061034          DOA     0,MUX          ;WORD
37 12740 024066          LDA     1,DTR
38 12741 066034          DOB     1,MUX
39                       MUXCLKA C4
40 12742 020240          LDA     0,C4
41 12743 006121          JSR     @ICONT
42                       MODEM   OFF
43 12744 020101          LDA     0,RECADR       ;OUTPUT MODEM CONTROL
44 12745 061034          DOA     0,MUX          ;WORD
45 12746 024067          LDA     1,OFF
46 12747 066034          DOB     1,MUX
47 12750 062677          IORST
48                       MUXCLKA C4
49 12751 020240          LDA     0,C4
50 12752 006121          JSR     @ICONT
51 12753 062434          DIC     0,MUX
52 12754 101234          MOVZR#  0,0,SZR
53                       EHALT                  ;-(RESET) TO MODEM MEMORY,
54 12755 006230          JSR@    IERR?
55 12756 006231          LOOPX                  ;DIC REGISTER
56 12757 006226 M007:    JSR@    IENT?          ;NO MODEM SIGNAL WITHOUT
57 12760 000005          5
58 12761 062677          IORST
59                       ADROUT                 ;MODEM BIT
60 12762 030101          LDA     2,RECADR       ;ADDRESS CORRECT
```

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 0138  PSID
01 12763 071034          DOA     2,MUX           ;BOARD
02 12764 102520          SUBZL   0,0             ;DTR WITHOUT BIT 0
03 12765 062034          DOB     0,MUX
04                       MUXCLKA C4
05 12766 020240          LDA     0,C4
06 12767 006121          JSR     @ICONT
07 12770 063734          SKPDZ   MUX
08                       EHALT                   ;CHECK MCON DECODER
09 12771 006230          JSR@    IERR?
10 12772 006231          LOOPX                   ;WITH BIT 0
11
12 12773 006226 M008:    JSR@    IENT?           ;NO MODEM SIGNAL WITH
13 12774 000005          5
14 12775 062677          IORST
15                       ADROUT                  ;DATA1
16 12776 030101          LDA     2,RECADR        ;ADDRESS CORRECT
17 12777 071034          DOA     2,MUX           ;BOARD
18 13000 020346          LDA     0,C14.1
19 13001 062034          DOB     0,MUX
20                       MUXCLKA C4
21 13002 020240          LDA     0,C4
22 13003 006121          JSR     @ICONT
23 13004 063734          SKPDZ   MUX
24                       EHALT                   ;CHECK DATA1 INPUT TO
25 13005 006230          JSR@    IERR?
26 13006 006231          LOOPX                   ;DOB MODEM DECODER
27
28 13007 006226 M009:    JSR@    IENT?           ;MODEM DTR WITHOUT
29 13010 000005          5
30 13011 062677          IORST
31                       ADROUT                  ;DATA15
32 13012 030101          LDA     2,RECADR        ;ADDRESS CORRECT
33 13013 071034          DOA     2,MUX           ;BOARD
34 13014 102620          SUBZR   0,0
35 13015 062034          DOB     0,MUX
36                       MUXCLKA C4
37 13016 020240          LDA     0,C4
38 13017 006121          JSR     @ICONT
39 13020 063734          SKPDZ   MUX
40                       EHALT                   ;-(DATA15) OPEN TO
41 13021 006230          JSR@    IERR?
42 13022 006231          LOOPX                   ; MODEM DECODER
43
44 13023 006226 M010:    JSR@    IENT?           ;CHECK BIT 15 NOT SET ON DIA
45 13024 000005          5
46 13025 062677          IORST
47                       MODEM   OFF
48 13026 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
49 13027 061034          DOA     0,MUX           ;WORD
50 13030 024067          LDA     1,OFF
51 13031 066034          DOB     1,MUX
52 13032 062677          IORST
53                       MODEM   DTR
54 13033 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
55 13034 061034          DOA     0,MUX           ;WORD
56 13035 024066          LDA     1,DTR
57 13036 066034          DOB     1,MUX
58                       MUXCLKA C4
59 13037 020240          LDA     0,C4
60 13040 006121          JSR     @ICONT
```

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 0139  PSID
01 13041 060434          DIA     0,MUX
02 13042 101232          MOVZR#  0,0,SZC
03                       EHALT                   ;DIA INPUT O.C. GATE, STORAGE
04 13043 006230          JSR@    IERR?
05 13044 006231          LOOPX                   ;FOR MODEM INTERRUPT
06 13045 006226 M011:    JSR@    IENT?           ;SEE THAT MODEM WILL RESET
07 13046 000005          5
08 13047 062677          IORST
09                       MODEM   OFF             ;ON A CLEAR PULSE
10 13050 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
11 13051 061034          DOA     0,MUX           ;WORD
12 13052 024067          LDA     1,OFF
13 13053 066034          DOB     1,MUX
14 13054 062677          IORST
15                       MODEM   DTR
16 13055 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
17 13056 061034          DOA     0,MUX           ;WORD
18 13057 024066          LDA     1,DTR
19 13060 066034          DOB     1,MUX
20                       MUXCLKA C4
21 13061 020240          LDA     0,C4
22 13062 006121          JSR     @ICONT
23 13063 060434          DIA     0,MUX
24 13064 062634          DICC    0,MUX           ;STROBE MODEM MEMORY
25 13065 101100          MOVL    0,0             ;DUMMY INSTRUCTION
26 13066 063734          SKPDZ   MUX
27                       EHALT                   ;CHECK -(MCLR) TO
28 13067 006230          JSR@    IERR?
29 13070 006231          LOOPX                   ;MDM DN FLOP
30
31 13071 006226 M012:    JSR@    IENT?           ;RESET MODEM BIT,SEE
32 13072 000005          5
33 13073 062677          IORST
34                       MODEM   OFF             ;THAT DONE SETS AGAIN
35 13074 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
36 13075 061034          DOA     0,MUX           ;WORD
37 13076 024067          LDA     1,OFF
38 13077 066034          DOB     1,MUX
39 13100 062677          IORST
40                       MODEM   DTR
41 13101 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
42 13102 061034          DOA     0,MUX           ;WORD
43 13103 024066          LDA     1,DTR
44 13104 066034          DOB     1,MUX
45                       MUXCLKA C4
46 13105 020240          LDA     0,C4
47 13106 006121          JSR     @ICONT
48 13107 060434          DIA     0,MUX
49 13110 062634          DICC    0,MUX
50                       MODEM   OFF
51 13111 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
52 13112 061034          DOA     0,MUX           ;WORD
53 13113 024067          LDA     1,OFF
54 13114 066034          DOB     1,MUX
55 13115 101100          MOVL    0,0             ;DUMMY INSTRUCTION
56 13116 063634          SKPDN   MUX
57                       EHALT                   ;MODEM RING TO COMPARATOR
58 13117 006230          JSR@    IERR?
59 13120 006231          LOOPX
60 13121 006226 M013:    JSR@    IENT?           ;CHECK THAT COMPARATOR
```

```
 0140  PSID
01 13122 000005          5
02 13123 062677          IORST
03                       MODEM   DTR             ;MATCHES AGAIN
04 13124 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
05 13125 061034          DOA     0,MUX           ;WORD
06 13126 024066          LDA     1,DTR
07 13127 066034          DOB     1,MUX
08                       MUXCLKA C4
09 13130 020240          LDA     0,C4
10 13131 006121          JSR     @ICONT
11 13132 060434          DIA     0,MUX
12 13133 062634          DICC    0,MUX
13                       MODEM   OFF
14 13134 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
15 13135 061034          DOA     0,MUX           ;WORD
16 13136 024067          LDA     1,OFF
17 13137 066034          DOB     1,MUX
18 13140 063634          SKPDN   MUX
19 13141 000777          JMP     .-1
20 13142 060434          DIA     0,MUX
21 13143 062434          DIC     0,MUX
22 13144 126520          SUBZL   1,1
23 13145 122414          SUB#    1,0,SZR
24                       EHALT                   ;MODEM MEMORY
25 13146 006230          JSR@    IERR?
26 13147 006231          LOOPX
27
28 13150 006226 M13A:    JSR@    IENT?           ;IF MDM DN IS RESET,
29 13151 000005          5
30 13152 062677          IORST
31                                               ;MEMORY (LATCH) WILL NOT BE
32                                               ;WRITTEN AND DONE WILL
33                       MODEM   OFF             ;SET AGAIN
34 13153 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
35 13154 061034          DOA     0,MUX           ;WORD
36 13155 024067          LDA     1,OFF
37 13156 066034          DOB     1,MUX
38 13157 062677          IORST
39                       MODEM   DTR
40 13160 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
41 13161 061034          DOA     0,MUX           ;WORD
42 13162 024066          LDA     1,DTR
43 13163 066034          DOB     1,MUX
44                       MUXCLKA C4
45 13164 020240          LDA     0,C4
46 13165 006121          JSR     @ICONT
47 13166 060634          DIAC    0,MUX           ;CLEAR DONE BEFORE DIC
48 13167 062434          DIC     0,MUX
49 13170 101100          MOVL    0,0
50 13171 063634          SKPDN   MUX
51                       EHALT                   ;MDM DN TO MODEM DIC
52 13172 006230          JSR@    IERR?
53 13173 006231          LOOPX                   ;LATCH (MEMORY)
54
55 13174 006226 M014:    JSR@    IENT?           ;SET DONE WITH MODEM
56 13175 000005          5
57 13176 062677          IORST
58                       MODEM   RTS             ;RTS SIGNAL
59 13177 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
60 13200 061034          DOA     0,MUX           ;WORD
```

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 0141  PSID
01 13201 024065          LDA     1,RTS
02 13202 066034          DOB     1,MUX
03                       MUXCLKA C4
04 13203 020240          LDA     0,C4
05 13204 006121          JSR     @ICONT
06 13205 063634          SKPDN   MUX
07                       EHALT                   ;CHECK MDM DN, PRIORITY
08 13206 006230          JSR@    IERR?
09 13207 006231          LOOPX                   ;LOGIC MODEM COMPARATOR
10 13210 006226 M015:    JSR@    IENT?           ;CHECK DSR (AND CD IF PSI/U) IS SET
11 13211 000005          5
12 13212 062677          IORST
13                       MODEM   OFF
14 13213 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
15 13214 061034          DOA     0,MUX           ;WORD
16 13215 024067          LDA     1,OFF
17 13216 066034          DOB     1,MUX
18 13217 062677          IORST
19                       MODEM   RTS
20 13220 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
21 13221 061034          DOA     0,MUX           ;WORD
22 13222 024065          LDA     1,RTS
23 13223 066034          DOB     1,MUX
24                       MUXCLKA C4
25 13224 020240          LDA     0,C4
26 13225 006121          JSR     @ICONT
27 13226 060434          DIA     0,MUX
28 13227 062434          DIC     0,MUX
29 13230 024241          LDA     1,C5
30 13231 030117          LDA     2,UFLAG
31 13232 151005          MOV     2,2,SNR                 ;PSI/U?
32 13233 024264          LDA     1,C25                   ;YES, INCLUDE CD WITH DSR AND MODEM
33 13234 122414          SUB#    1,0,SZR
34                       EHALT                   ;DSR INPUT GATE, MODEM
35 13235 006230          JSR@    IERR?
36 13236 006231          LOOPX                   ;MEMORY, MUX BD DINC O.C. GATE
37
38 13237 006226 M016:    JSR@    IENT?           ;RESET MODEM BIT, SEE
39 13240 000005          5
40 13241 062677          IORST
41                       MODEM   RTS             ;THAT DONE SETS AGAIN
42 13242 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
43 13243 061034          DOA     0,MUX           ;WORD
44 13244 024065          LDA     1,RTS
45 13245 066034          DOB     1,MUX
46                       MUXCLKA C4
47 13246 020240          LDA     0,C4
48 13247 006121          JSR     @ICONT
49 13250 060434          DIA     0,MUX
50 13251 062434          DIC     0,MUX           ;THIS CLOCKS MODEM MEMORY
51                       MODEM   OFF
52 13252 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
53 13253 061034          DOA     0,MUX           ;WORD
54 13254 024067          LDA     1,OFF
55 13255 066034          DOB     1,MUX
56 13256 060634          DIAC    0,MUX
57 13257 101100          MOVL    0,0
58 13260 063634          SKPDN   MUX
59                       EHALT                   ;MODEM MEMORY
60 13261 006230          JSR@    IERR?
```

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 0142  PSID
01 13262 006231          LOOPX
02 13263 006226 M017:    JSR@    IENT?           ;CHECK THAT COMPARATOR
03 13264 000005          5
04 13265 062677          IORST
05                       MODEM   RTS             ;MATCHES AGAIN
06 13266 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
07 13267 061034          DOA     0,MUX           ;WORD
08 13270 024065          LDA     1,RTS
09 13271 066034          DOB     1,MUX
10                       MUXCLKA C4
11 13272 020240          LDA     0,C4
12 13273 006121          JSR     @ICONT
13 13274 060434          DIA     0,MUX
14 13275 062634          DICC    0,MUX
15                       MODEM   OFF
16 13276 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
17 13277 061034          DOA     0,MUX           ;WORD
18 13300 024067          LDA     1,OFF
19 13301 066034          DOB     1,MUX
20 13302 063634          SKPDN   MUX
21 13303 000777          JMP     .-1
22 13304 060434          DIA     0,MUX
23 13305 062434          DIC     0,MUX
24 13306 126520          SUBZL   1,1
25 13307 122414          SUB#    1,0,SZR
26                       EHALT                   ;MODEM COMPARATOR
27 13310 006230          JSR@    IERR?
28 13311 006231          LOOPX
29
30 13312 030117          LDA     2,UFLAG
31 13313 151005          MOV     2,2,SNR         ;PSI/U?
32 13314 002402          JMP     @.+2            ;YES
33 13315 000402          JMP     .+2
34 13316 013637          M026                    ;PSI/U TESTS
35 13317 006226 M018:    JSR@    IENT?           ;CHECK SPA GENERATES
36 13320 000005          5
37 13321 062677          IORST
38                       MODEM   OFF             ;CD MODEM INTERRUPT
39 13322 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
40 13323 061034          DOA     0,MUX           ;WORD
41 13324 024067          LDA     1,OFF
42 13325 066034          DOB     1,MUX
43 13326 062677          IORST
44                       MODEM   SPA
45 13327 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
46 13330 061034          DOA     0,MUX           ;WORD
47 13331 024070          LDA     1,SPA
48 13332 066034          DOB     1,MUX
49                       MUXCLKA C4
50 13333 020240          LDA     0,C4
51 13334 006121          JSR     @ICONT
52 13335 063634          SKPDN   MUX
53                       EHALT                   ;SPA OUTPUT, CD INPUT GATES
54 13336 006230          JSR@    IERR?
55 13337 006231          LOOPX
56 13340 006226 M019:    JSR@    IENT?           ;CHECK FOR CORRECT MODEM BIT
57 13341 000005          5
58 13342 062677          IORST
59                       MODEM   OFF
60 13343 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
```

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 0143  PSID
01 13344 061034          DOA     0,MUX           ;WORD
02 13345 024067          LDA     1,OFF
03 13346 066034          DOB     1,MUX
04 13347 062677          IORST
05                       MODEM   SPA
06 13350 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
07 13351 061034          DOA     0,MUX           ;WORD
08 13352 024070          LDA     1,SPA
09 13353 066034          DOB     1,MUX
10                       MUXCLKA C4
11 13354 020240          LDA     0,C4
12 13355 006121          JSR     @ICONT
13 13356 060434          DIA     0,MUX
14 13357 062434          DIC     0,MUX
15 13360 024263          LDA     1,C21
16 13361 122414          SUB#    1,0,SZR
17                       EHALT                   ;DIC REGISTER, O.C. GATES
18 13362 006230          JSR@    IERR?
19 13363 006231          LOOPX
20
21 13364 006226 M019A:   JSR@    IENT?           ;CHECK CD INPUT WITHOUT MUX BD DINC
22 13365 000005          5
23 13366 062677          IORST
24                       MODEM   OFF
25 13367 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
26 13370 061034          DOA     0,MUX           ;WORD
27 13371 024067          LDA     1,OFF
28 13372 066034          DOB     1,MUX
29 13373 062677          IORST
30                       MODEM   SPA
31 13374 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
32 13375 061034          DOA     0,MUX           ;WORD
33 13376 024070          LDA     1,SPA
34 13377 066034          DOB     1,MUX
35                       MUXCLKA C4
36 13400 020240          LDA     0,C4
37 13401 006121          JSR     @ICONT
38 13402 060434          DIA     0,MUX
39 13403 061434          DIB     0,MUX
40 13404 024262          LDA     1,C20
41 13405 123414          AND#    1,0,SZR
42                       EHALT                   ;DIC O.C. GATE (CD)
43 13406 006230          JSR@    IERR?
44 13407 006231          LOOPX
45 13410 006226 M020:    JSR@    IENT?           ;RESET MODEM BIT, SEE
46 13411 000005          5
47 13412 062677          IORST
48                       MODEM   OFF             ;THAT DONE SETS AGAIN
49 13413 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
50 13414 061034          DOA     0,MUX           ;WORD
51 13415 024067          LDA     1,OFF
52 13416 066034          DOB     1,MUX
53 13417 062677          IORST
54                       MODEM   SPA
55 13420 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
56 13421 061034          DOA     0,MUX           ;WORD
57 13422 024070          LDA     1,SPA
58 13423 066034          DOB     1,MUX
59                       MUXCLKA C4
60 13424 020240          LDA     0,C4
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 0144  PSID
01 13425 006121          JSR     @ICONT
02 13426 060434          DIA     0,MUX
03 13427 062634          DICC    0,MUX
04                       MODEM   OFF
05 13430 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
06 13431 061034          DOA     0,MUX           ;WORD
07 13432 024067          LDA     1,OFF
08 13433 066034          DOB     1,MUX
09 13434 101100          MOVL    0,0
10 13435 063634          SKPDN   MUX
11                       EHALT                   ;MODEM MEMORY
12 13436 006230          JSR@    IERR?
13 13437 006231          LOOPX
14
15 13440 006226 M021:    JSR@    IENT?           ;CHECK THAT COMPARATOR
16 13441 000005          5
17 13442 062677          IORST
18                       MODEM   SPA             ;MATCHES AGAIN
19 13443 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
20 13444 061034          DOA     0,MUX           ;WORD
21 13445 024070          LDA     1,SPA
22 13446 066034          DOB     1,MUX
23                       MUXCLKA C4
24 13447 020240          LDA     0,C4
25 13450 006121          JSR     @ICONT
26 13451 060434          DIA     0,MUX
27 13452 062634          DICC    0,MUX
28                       MODEM   OFF
29 13453 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
30 13454 061034          DOA     0,MUX           ;WORD
31 13455 024067          LDA     1,OFF
32 13456 066034          DOB     1,MUX
33 13457 063634          SKPDN   MUX
34 13460 000777          JMP     .-1
35 13461 060434          DIA     0,MUX
36 13462 062434          DIC     0,MUX
37 13463 126520          SUBZL   1,1
38 13464 122414          SUB#    1,0,SZR
39                       EHALT                   ;MODEM COMPARATOR
40 13465 006230          JSR@    IERR?
41 13466 006231          LOOPX
42 13467 006226 M022:    JSR@    IENT?           ;CHECK THAT SPB GENERATES
43 13470 000005          5
44 13471 062677          IORST
45                       MODEM   OFF             ;CTS MODEM INTERRUPT
46 13472 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
47 13473 061034          DOA     0,MUX           ;WORD
48 13474 024067          LDA     1,OFF
49 13475 066034          DOB     1,MUX
50 13476 062677          IORST
51                       MODEM   SPB
52 13477 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
53 13500 061034          DOA     0,MUX           ;WORD
54 13501 024071          LDA     1,SPB
55 13502 066034          DOB     1,MUX
56                       MUXCLKA C4
57 13503 020240          LDA     0,C4
58 13504 006121          JSR     @ICONT
59 13505 063634          SKPDN   MUX
60                       EHALT                   ;SPB OUTPUT, CTS  INPUT GATES
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 0145  PSID
01 13506 006230          JSR@    IERR?
02 13507 006231          LOOPX
03
04 13510 006226 M023:    JSR@    IENT?           ;CHECK FOR CORRECT MODEM BIT
05 13511 000005          5
06 13512 062677          IORST
07                       MODEM   OFF
08 13513 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
09 13514 061034          DOA     0,MUX           ;WORD
10 13515 024067          LDA     1,OFF
11 13516 066034          DOB     1,MUX
12 13517 062677          IORST
13                       MODEM   SPB
14 13520 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
15 13521 061034          DOA     0,MUX           ;WORD
16 13522 024071          LDA     1,SPB
17 13523 066034          DOB     1,MUX
18                       MUXCLKA C4
19 13524 020240          LDA     0,C4
20 13525 006121          JSR     @ICONT
21 13526 060434          DIA     0,MUX
22 13527 062434          DIC     0,MUX
23 13530 024256          LDA     1,C11
24 13531 122414          SUB#    1,0,SZR
25                       EHALT                   ;DIC REGISTERS, O.C. GATES
26 13532 006230          JSR@    IERR?
27 13533 006231          LOOPX
28
29 13534 006226 M024:    JSR@    IENT?           ;RESET MODEM BIT, SEE
30 13535 000005          5
31 13536 062677          IORST
32                       MODEM   OFF
33 13537 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
34 13540 061034          DOA     0,MUX           ;WORD
35 13541 024067          LDA     1,OFF
36 13542 066034          DOB     1,MUX
37 13543 062677          IORST                   ;THAT DONE SETS AGAIN
38                       MODEM   SPB
39 13544 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
40 13545 061034          DOA     0,MUX           ;WORD
41 13546 024071          LDA     1,SPB
42 13547 066034          DOB     1,MUX
43                       MUXCLKA C4
44 13550 020240          LDA     0,C4
45 13551 006121          JSR     @ICONT
46 13552 060434          DIA     0,MUX
47 13553 062634          DICC    0,MUX
48                       MODEM   OFF
49 13554 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
50 13555 061034          DOA     0,MUX           ;WORD
51 13556 024067          LDA     1,OFF
52 13557 066034          DOB     1,MUX
53 13560 101100          MOVL    0,0
54 13561 063634          SKPDN   MUX
55                       EHALT                   ;MODEM MEMORY
56 13562 006230          JSR@    IERR?
57 13563 006231          LOOPX
58
59 13564 006226 M025:    JSR@    IENT?           ;CHECK THAT COMPARATOR
60 13565 000005          5
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 0146  PSID
01 13566 062677          IORST
02                       MODEM   SPB             ;MATCHES AGAIN
03 13567 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
04 13570 061034          DOA     0,MUX           ;WORD
05 13571 024071          LDA     1,SPB
06 13572 066034          DOB     1,MUX
07                       MUXCLKA C4
08 13573 020240          LDA     0,C4
09 13574 006121          JSR     @ICONT
10 13575 060434          DIA     0,MUX
11 13576 062634          DICC    0,MUX
12                       MODEM   OFF
13 13577 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
14 13600 061034          DOA     0,MUX           ;WORD
15 13601 024067          LDA     1,OFF
16 13602 066034          DOB     1,MUX
17 13603 063634          SKPDN   MUX
18 13604 000777          JMP     .-1
19 13605 060434          DIA     0,MUX
20 13606 062434          DIC     0,MUX
21 13607 126520          SUBZL   1,1
22 13610 122414          SUB#    1,0,SZR
23                       EHALT                   ;MODEM COMPARATOR
24 13611 006230          JSR@    IERR?
25 13612 006231          LOOPX
26 13613 020112 SWAP:    LDA     0,NLINE         ;IF ONLY ONE LINE,
27 13614 101232          MOVZR#  0,0,SZC         ;FORGET PRIORITY TESTS
28 13615 002417          JMP     @,XCRC1
29 13616 020101          LDA     0,RECADR        ;TWO LINES IN SYSTEM
30 13617 024103          LDA     1,ORADR
31 13620 040103          STA     0,ORADR
32 13621 044101          STA     1,RECADR
33 13622 101400          INC     0,0
34 13623 040104          STA     0,OTADR
35 13624 125400          INC     1,1
36 13625 044102          STA     1,TRADR
37 13626 020105          LDA     0,SWITCH
38 13627 101004          MOV     0,0,SZR
39 13630 000446          JMP     T082            ;CONTINUE
40 13631 102000          ADC     0,0
41 13632 040105          STA     0,SWITCH
42 13633 002402          JMP     @,XA006         ;GO BACK TO REPEAT FOR LINE 1
43
44 13634 014634 XCRC1:CRC1
45 13635 001032 XA006:A006
46 13636 040200 SZ200:40200
47 13637 006226 M026:    JSR@    IENT?           ;DON'T SET DONE WITH MODEM SECTION TURNED OFF
48 13640 000005          5
49 13641 062677          IORST
50                       OFFMDM  DTR             ;DTR SIGNAL
51 13642 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
52 13643 061034          DOA     0,MUX   ;WORD
53 13644 030063          LDA     2,COFF          ;TURN MODEM SECTION OFF
54 13645 073034          DOC     2,MUX           ;WORD
55 13646 024066          LDA     1,DTR
56 13647 066034          DOB     1,MUX
57                       MUXCLKA C4
58 13650 020240          LDA     0,C4
59 13651 006121          JSR     @ICONT
60 13652 063734          SKPDZ   MUX
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 0147  PSID
01                      EHALT                           ;YES, BIT 2 DECODE ON DOC
02 13653 006230         JSR@    IERR?
03 13654 006231         LOOPX
04
05 13655 006226 M027:   JSR@    IENT?                  ;SET DONE WITH MODEM SECTION TURNED ON
06 13656 000005         5
07 13657 062677         IORST
08                      OFFMDM  DTR                     ;DTR SIGNAL
09 13660 020101         LDA     0,RECADR               ;OUTPUT MODEM CONTROL
10 13661 061034         DOA     0,MUX   ;WORD
11 13662 030063         LDA     2,COFF                 ;TURN MODEM SECTION OFF
12 13663 073034         DOC     2,MUX                  ;WORD
13 13664 024066         LDA     1,DTR
14 13665 066034         DOB     1,MUX
15 13666 030064         LDA     2,CON
16 13667 073034         DOC     2,MUX                  ;MODEM SECTION ON
17                      MUXCLKA C4
18 13670 020240         LDA     0,C4
19 13671 006121         JSR     @ICONT
20 13672 063634         SKPDN   MUX
21                      EHALT                           ;BIT 2 AND BIT 15 ON DOC
22 13673 006230         JSR@    IERR?
23 13674 006231         LOOPX
24
25 13675 002737         JMP     @,XCRC1                ;PSI/U IS ONLY ONE LINE
26                                                      ;FORGET PRIORTY TESTS
27              T082:   SYNC    SZ200
28 13676 006226         JSR@    IENT?
29 13677 000005         5
30 13700 062677         IORST
31                      ADROUT
32 13701 030101         LDA     2,RECADR               ;ADDRESS CORRECT
33 13702 071034         DOA     2,MUX                  ;BOARD
34 13703 020733         LDA     0,SZ200
35 13704 063034         DOC     0,MUX
36 13705 151400         INC     2,2
37 13706 071034         DOA     2,MUX
38 13707 063034         DOC     0,MUX
39 13710 006226         JSR@    IENT?                          ;CHECK THAT NOLOOP WORKS
40 13711 000005         5
41 13712 062677         IORST
42                                                      ;(LOOPBACK OFF)
43                      TRANSMIT        NOLOOP,NOPARITY,CODE8
44 13713 006155         JSR@    ITRMT
45 13714 100030 100000+NOLOOP+NOPARITY+CODE8
46 13715 020103         LDA     0,ORADR                ;SET UP OPPOSITE
47 13716 061034         DOA     0,MUX                  ;RECEIVER
48                      LCS     NOLOOP,NOPARITY,CODE8
49 13717 006120         JSR     @.LINCH                ;OUTPUT LINE CHARACTERISTICS
50 13720 100030         100000+NOLOOP+NOPARITY+CODE8
51 13721 024715         LDA     1,SZ200 ;SYNC WORD
52 13722 067034         DOC     1,MUX
53 13723 020104         LDA     0,OTADR
54 13724 061034         DOA     0,MUX
55 13725 067034         DOC     1,MUX
56                      MODEM   SPB
57 13726 020101         LDA     0,RECADR               ;OUTPUT MODEM CONTROL
58 13727 061034         DOA     0,MUX                  ;WORD
59 13730 024071         LDA     1,SPB
60 13731 066034         DOB     1,MUX
```

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 0148  PSID
01                          XCLK    C1
02 13732 020235             LDA     0,C1
03 13733 006123             JSR     @.STEP
04 13734 020103             LDA     0,ORADR         ;TURN ON OPPOSITE
05 13735 061034             DOA     0,MUX           ;RECEIVER
06 13736 126520             SUBZL   1,1
07 13737 067034             DOC     1,MUX
08                          MUXCLKA 1
09 13740 020001             LDA     0,1
10 13741 006121             JSR     @ICONT
11                          X.CLK   30.
12 13742 030363             LDA     2,CM30.
13                          XCLK    C1
14 13743 020235             LDA     0,C1
15 13744 006123             JSR     @.STEP
16                          MUXCLKA C5
17 13745 020241             LDA     0,C5
18 13746 006121             JSR     @ICONT
19 13747 151404             INC     2,2,SZR
20 13750 000773             JMP     .-5
21 13751 020102             LDA     0,TRADR
22 13752 061034             DOA     0,MUX
23 13753 024326             LDA     1,C377
24 13754 066034             DOB     1,MUX
25                          X.CLK   18.
26 13755 030362             LDA     2,CM18.
27                          XCLK    C1
28 13756 020235             LDA     0,C1
29 13757 006123             JSR     @.STEP
30                          MUXCLKA C5
31 13760 020241             LDA     0,C5
32 13761 006121             JSR     @ICONT
33 13762 151404             INC     2,2,SZR
34 13763 000773             JMP     .-5
35 13764 060434             DIA     0,MUX
36 13765 024103             LDA     1,ORADR
37 13766 122414             SUB#    1,0,SZR
38                          EHALT                   ;LOOPBACK,EXTERNAL XMIT, RECV
39 13767 006230             JSR@    IERR?
40 13770 006231             LOOPX                   ;CLOCKS- IF MODEM, CTS TO
41                                                  ;XMITTER, DTR
42
43 13771 006226 T083:       JSR@    IENT?           ;MAKE SURE MODEM IS
44 13772 000005             5
45 13773 062677             IORST
46                                                  ;NOT UP ON NOLOOP
47                          MODEM   OFF
48 13774 020101             LDA     0,RECADR        ;OUTPUT MODEM CONTROL
49 13775 061034             DOA     0,MUX           ;WORD
50 13776 024067             LDA     1,OFF
51 13777 066034             DOB     1,MUX
52                          TRANSMIT        NOLOOP,NOPARITY,CODE8
53 14000 006155             JSR@    ITRMT
54 14001 100030 100000+NOLOOP+NOPARITY+CODE8
55 14002 020103             LDA     0,ORADR
56 14003 061034             DOA     0,MUX
57 14004 126520             SUBZL   1,1
58 14005 067034             DOC     1,MUX
59                          MUXCLKA 1
60 14006 020001             LDA     0,1
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 0149  PSID
01 14007 006121          JSR     @ICONT
02                       X.CLK   30.
03 14010 030363          LDA     2,CM30.
04                       XCLK    C1
05 14011 020235          LDA     0,C1
06 14012 006123          JSR     @.STEP
07                       MUXCLKA C5
08 14013 020241          LDA     0,C5
09 14014 006121          JSR     @ICONT
10 14015 151404          INC     2,2,SZR
11 14016 000773          JMP     .-5
12 14017 020102          LDA     0,TRADR
13 14020 061034          DOA     0,MUX
14 14021 024326          LDA     1,C377
15 14022 066034          DOB     1,MUX
16                       X.CLK   18.
17 14023 030362          LDA     2,CM18.
18                       XCLK    C1
19 14024 020235          LDA     0,C1
20 14025 006123          JSR     @.STEP
21                       MUXCLKA C5
22 14026 020241          LDA     0,C5
23 14027 006121          JSR     @ICONT
24 14030 151404          INC     2,2,SZR
25 14031 000773          JMP     .-5
26 14032 060434          DIA     0,MUX
27 14033 101233          MOVZR#  0,0,SNC          ;CHECK RECEIVER DID NOT
28                       EHALT                    ;SET DONE- MODEM CTS TO
29 14034 006230          JSR@    IERR?
30 14035 006231          LOOPX                    ;XMITTER, DTR ALWAYS ON
31 14036 006226 T084:    JSR@    IENT?            ;SWITCH LINES AND REPEAT TESTS
32 14037 000005          5
33 14040 062677          IORST
34 14041 020104          LDA     0,OTADR
35 14042 061034          DOA     0,MUX
36                       LCS     NOLOOP,NOPARITY,CODE8
37 14043 006120          JSR     @.LINCH          ;OUTPUT LINE CHARACTERISTICS
38 14044 100030          100000+NOLOOP+NOPARITY+CODE8
39 14045 126520          SUBZL   1,1
40 14046 067034          DOC     1,MUX
41 14047 020101          LDA     0,RECADR
42 14050 061034          DOA     0,MUX
43                       LCS     NOLOOP,NOPARITY,CODE8
44 14051 006120          JSR     @.LINCH          ;OUTPUT LINE CHARACTERISTICS
45 14052 100030          100000+NOLOOP+NOPARITY+CODE8
46 14053 020103          LDA     0,ORADR
47 14054 061034          DOA     0,MUX
48 14055 024071          LDA     1,SPB
49 14056 066034          DOB     1,MUX
50                       XCLK    C1
51 14057 020235          LDA     0,C1
52 14060 006123          JSR     @.STEP
53 14061 020101          LDA     0,RECADR
54 14062 061034          DOA     0,MUX
55 14063 126520          SUBZL   1,1
56 14064 067034          DOC     1,MUX
57                       MUXCLKA C1
58 14065 020235          LDA     0,C1
59 14066 006121          JSR     @ICONT
60                       X.CLK   30.
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 0150  PSID
01 14067 030363          LDA     2,CM30.
02                       XCLK    C1
03 14070 020235          LDA     0,C1
04 14071 006123          JSR     @.STEP
05                       MUXCLKA C5
06 14072 020241          LDA     0,C5
07 14073 006121          JSR     @ICONT
08 14074 151404          INC     2,2,SZR
09 14075 000773          JMP     .-5
10 14076 020104          LDA     0,OTADR
11 14077 061034          DOA     0,MUX
12 14100 024326          LDA     1,C377
13 14101 066034          DOB     1,MUX
14                       X.CLK   18.
15 14102 030362          LDA     2,CM18.
16                       XCLK    C1
17 14103 020235          LDA     0,C1
18 14104 006123          JSR     @.STEP
19                       MUXCLKA C5
20 14105 020241          LDA     0,C5
21 14106 006121          JSR     @ICONT
22 14107 151404          INC     2,2,SZR
23 14110 000773          JMP     .-5
24 14111 060434          DIA     0,MUX
25 14112 024101          LDA     1,RECADR
26 14113 122414          SUB#    1,0,SZR
27                       EHALT                   ;LOOPBACK, EXTERNAL XMIT, RECV
28 14114 006230          JSR@    IERR?
29 14115 006231          LOOPX                   ;CLOCKS- IF MODEM, CTS TO
30                                               ;XMITTER, DTR
31 14116 006226 T085:    JSR@    IENT?           ;OTHER MODEM NOT UP ON NOLOOP
32 14117 000005          5
33 14120 062677          IORST
34 14121 020103          LDA     0,ORADR
35 14122 061034          DOA     0,MUX
36 14123 024067          LDA     1,OFF
37 14124 066034          DOB     1,MUX
38 14125 020104          LDA     0,OTADR
39 14126 061034          DOA     0,MUX
40                       LCS     NOLOOP,NOPARITY,CODE8
41 14127 006120          JSR     @.LINCH         ;OUTPUT LINE CHARACTERISTICS
42 14130 100030          100000+NOLOOP+NOPARITY+CODE8
43 14131 126520          SUBZL   1,1
44 14132 067034          DOC     1,MUX
45 14133 020101          LDA     0,RECADR
46 14134 061034          DOA     0,MUX
47 14135 067034          DOC     1,MUX
48                       MUXCLKA C1
49 14136 020235          LDA     0,C1
50 14137 006121          JSR     @ICONT
51                       X.CLK   30.
52 14140 030363          LDA     2,CM30.
53                       XCLK    C1
54 14141 020235          LDA     0,C1
55 14142 006123          JSR     @.STEP
56                       MUXCLKA C5
57 14143 020241          LDA     0,C5
58 14144 006121          JSR     @ICONT
59 14145 151404          INC     2,2,SZR
60 14146 000773          JMP     .-5
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 0151  PSID
01 14147 020104          LDA     0,OTADR
02 14150 061034          DOA     0,MUX
03 14151 024326          LDA     1,C377
04 14152 066034          DOB     1,MUX
05                       X.CLK   18.
06 14153 030362          LDA     2,CM18.
07                       XCLK    C1
08 14154 020235          LDA     0,C1
09 14155 006123          JSR     @.STEP
10                       MUXCLKA C5
11 14156 020241          LDA     0,C5
12 14157 006121          JSR     @ICONT
13 14160 151404          INC     2,2,SZR
14 14161 000773          JMP     .-5
15 14162 060434          DIA     0,MUX
16 14163 101233          MOVZR#  0,0,SNC          ;CHECK RECEIVER DID NOT
17                       EHALT                    ;SET DONE- MODEM CTS TO XMITTER
18 14164 006230          JSR@    IERR?
19 14165 006231          LOOPX                    ;DTR ALWAYS ON
20              ;CHECK PRIORITY LOGIC
21
22 14166 006226 T086:    JSR@    IENT?            ;MODEM 0 OVER MODEM 1
23 14167 000005          5
24 14170 062677          IORST
25                       MODEM   RTS
26 14171 020101          LDA     0,RECADR         ;OUTPUT MODEM CONTROL
27 14172 061034          DOA     0,MUX            ;WORD
28 14173 024065          LDA     1,RTS
29 14174 066034          DOB     1,MUX
30 14175 020103          LDA     0,ORADR
31 14176 061034          DOA     0,MUX
32 14177 066034          DOB     1,MUX
33                       MUXCLKA C4
34 14200 020240          LDA     0,C4
35 14201 006121          JSR     @ICONT
36 14202 060434          DIA     0,MUX
37 14203 024075          LDA     1,BDADR
38 14204 122414          SUB#    1,0,SZR
39                       EHALT                    ;PRIORITY LOGIC
40 14205 006230          JSR@    IERR?
41 14206 006231          LOOPX
42
43 14207 006226 T087:    JSR@    IENT?            ;XMIT 1 OVER MODEM 0
44 14210 000005          5
45 14211 062677          IORST
46                       MODEM   RTS
47 14212 020101          LDA     0,RECADR         ;OUTPUT MODEM CONTROL
48 14213 061034          DOA     0,MUX            ;WORD
49 14214 024065          LDA     1,RTS
50 14215 066034          DOB     1,MUX
51 14216 020103          LDA     0,ORADR
52 14217 061034          DOA     0,MUX
53 14220 066034          DOB     1,MUX
54 14221 024104          LDA     1,OTADR
55 14222 065034          DOA     1,MUX
56 14223 102520          SUBZL   0,0
57 14224 063034          DOC     0,MUX
58                       MUXCLKA C4
59 14225 020240          LDA     0,C4
60 14226 006121          JSR     @ICONT
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 0152  PSID
01 14227 060434          DIA     0,MUX
02 14230 122414          SUB#    1,0,SZR
03                       EHALT                   ;PRIORITY LOGIC
04 14231 006230          JSR@    IERR?
05 14232 006231          LOOPX
06
07 14233 006226 T088:    JSR@    IENT?           ;XMIT 0 OVER XMIT 1
08 14234 000005          5
09 14235 062677          IORST
10                       MODEM   RTS             ;MODEM 0
11 14236 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
12 14237 061034          DOA     0,MUX           ;WORD
13 14240 024065          LDA     1,RTS
14 14241 066034          DOB     1,MUX
15 14242 020103          LDA     0,ORADR         ;MODEM 1
16 14243 061034          DOA     0,MUX
17 14244 066034          DOB     1,MUX
18 14245 020102          LDA     0,TRADR         ;XMITTER 0
19 14246 126520          SUBZL   1,1
20 14247 061034          DOA     0,MUX
21 14250 067034          DOC     1,MUX
22 14251 020104          LDA     0,OTADR         ;TRANSMITTER 1
23 14252 061034          DOA     0,MUX
24 14253 067034          DOC     1,MUX
25                       MUXCLKA C4
26 14254 020240          LDA     0,C4
27 14255 006121          JSR     @ICONT
28 14256 060434          DIA     0,MUX
29 14257 024102          LDA     1,TRADR
30 14260 122414          SUB#    1,0,SZR
31                       EHALT                   ;PRIORITY LOGIC
32 14261 006230          JSR@    IERR?
33 14262 006231          LOOPX
34               T089:   SYNC    SY026           ;SET UP SYNC WORD FOR BOTH LINES
35 14263 006226          JSR@    IENT?
36 14264 000005          5
37 14265 062677          IORST
38                       ADROUT
39 14266 030101          LDA     2,RECADR        ;ADDRESS CORRECT
40 14267 071034          DOA     2,MUX           ;BOARD
41 14270 020365          LDA     0,SY026
42 14271 063034          DOC     0,MUX
43 14272 151400          INC     2,2
44 14273 071034          DOA     2,MUX
45 14274 063034          DOC     0,MUX
46 14275 006226          JSR@    IENT?           ;RECV 1 OVER XMIT 0
47 14276 000005          5
48 14277 062677          IORST
49 14300 030103          LDA     2,ORADR
50 14301 071034          DOA     2,MUX
51 14302 063034          DOC     0,MUX
52 14303 151400          INC     2,2
53 14304 071034          DOA     2,MUX
54 14305 063034          DOC     0,MUX
55                       MODEM   RTS             ;MODEM 0
56 14306 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
57 14307 061034          DOA     0,MUX           ;WORD
58 14310 024065          LDA     1,RTS
59 14311 066034          DOB     1,MUX
60 14312 020103          LDA     0,ORADR
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 0153  PSID
01 14313 061034          DOA     0,MUX
02 14314 066034          DOB     1,MUX           ;MODEM 1
03 14315 020102          LDA     0,TRADR         ;XMITTER 0
04 14316 061034          DOA     0,MUX
05 14317 152520          SUBZL   2,2
06 14320 073034          DOC     2,MUX
07 14321 020104          LDA     0,OTADR         ;XMITTER 1
08 14322 061034          DOA     0,MUX
09 14323 073034          DOC     2,MUX
10                       LCS     LOOPBACK,NOPARITY,CODE8
11 14324 006120          JSR     @.LINCH         ;OUTPUT LINE CHARACTERISTICS
12 14325 100031          100000+LOOPBACK+NOPARITY+CODE8
13                       XCLK    C1
14 14326 020235          LDA     0,C1
15 14327 006123          JSR     @.STEP
16 14330 020103          LDA     0,ORADR
17 14331 061034          DOA     0,MUX
18 14332 073034          DOC     2,MUX           ;RECEIVER 1
19                       MUXCLKA C1
20 14333 020235          LDA     0,C1
21 14334 006121          JSR     @ICONT
22                       X.CLK   30.
23 14335 030363          LDA     2,CM30.
24                       XCLK    C1
25 14336 020235          LDA     0,C1
26 14337 006123          JSR     @.STEP
27                       MUXCLKA C5
28 14340 020241          LDA     0,C5
29 14341 006121          JSR     @ICONT
30 14342 151404          INC     2,2,SZR
31 14343 000773          JMP     .-5
32 14344 020104          LDA     0,OTADR
33 14345 061034          DOA     0,MUX
34 14346 024314          LDA     1,C252
35 14347 066034          DOB     1,MUX
36                       X.CLK   18.
37 14350 030362          LDA     2,CM18.
38                       XCLK    C1
39 14351 020235          LDA     0,C1
40 14352 006123          JSR     @.STEP
41                       MUXCLKA C5
42 14353 020241          LDA     0,C5
43 14354 006121          JSR     @ICONT
44 14355 151404          INC     2,2,SZR
45 14356 000773          JMP     .-5
46 14357 060434          DIA     0,MUX
47 14360 024103          LDA     1,ORADR
48 14361 122414          SUB#    1,0,SZR
49                       EHALT                   ;PRIORITY LOGIC
50 14362 006230          JSR@    IERR?
51 14363 006231          LOOPX
52 14364 006226 T090:    JSR@    IENT?           ;RECV 0 OVER RECV 1
53 14365 000005          5
54 14366 062677          IORST
55                       MODEM   RTS             ;MODEM 0
56 14367 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
57 14370 061034          DOA     0,MUX           ;WORD
58 14371 024065          LDA     1,RTS
59 14372 066034          DOB     1,MUX
60 14373 020103          LDA     0,ORADR
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 0154  PSID
01 14374 061034          DOA     0,MUX
02 14375 066034          DOB     1,MUX           ;MODEM 1
03 14376 020102          LDA     0,TRADR
04 14377 061034          DOA     0,MUX
05 14400 152520          SUBZL   2,2
06 14401 073034          DOC     2,MUX           ;XMITTER 0
07                       LCS     LOOPBACK,NOPARITY,CODE8
08 14402 006120          JSR     @.LINCH         ;OUTPUT LINE CHARACTERISTICS
09 14403 100031          100000+LOOPBACK+NOPARITY+CODE8
10 14404 020104          LDA     0,OTADR
11 14405 061034          DOA     0,MUX           ;TRANSMITTER 1
12 14406 073034          DOC     2,MUX
13                       LCS     LOOPBACK,NOPARITY,CODE8
14 14407 006120          JSR     @.LINCH         ;OUTPUT LINE CHARACTERISTICS
15 14410 100031          100000+LOOPBACK+NOPARITY+CODE8
16                       XCLK    C1
17 14411 020235          LDA     0,C1
18 14412 006123          JSR     @.STEP
19                       RECEIVER                ;RECEIVER 0
20 14413 020101          LDA     0,RECADR
21 14414 061034          DOA     0,MUX           ;ENABLE RECEIVER
22 14415 126520          SUBZL   1,1
23 14416 067034          DOC     1,MUX           ;START RECEIVER
24 14417 020103          LDA     0,ORADR
25 14420 061034          DOA     0,MUX
26 14421 067034          DOC     1,MUX           ;RECEIVER 1
27                       MUXCLKA C1
28 14422 020235          LDA     0,C1
29 14423 006121          JSR     @ICONT
30                       X.CLK   30.
31 14424 030363          LDA     2,CM30.
32                       XCLK    C1
33 14425 020235          LDA     0,C1
34 14426 006123          JSR     @.STEP
35                       MUXCLKA C5
36 14427 020241          LDA     0,C5
37 14430 006121          JSR     @ICONT
38 14431 151404          INC     2,2,SZR
39 14432 000773          JMP     .-5
40 14433 020104          LDA     0,OTADR
41 14434 061034          DOA     0,MUX
42 14435 024314          LDA     1,C252
43 14436 066034          DOB     1,MUX
44 14437 020102          LDA     0,TRADR
45 14440 061034          DOA     0,MUX
46 14441 066034          DOB     1,MUX
47                       X.CLK   18.
48 14442 030362          LDA     2,CM18.
49                       XCLK    C1
50 14443 020235          LDA     0,C1
51 14444 006123          JSR     @.STEP
52                       MUXCLKA C5
53 14445 020241          LDA     0,C5
54 14446 006121          JSR     @ICONT
55 14447 151404          INC     2,2,SZR
56 14450 000773          JMP     .-5
57 14451 060434          DIA     0,MUX
58 14452 024101          LDA     1,RECADR
59 14453 122414          SUB#    1,0,SZR
60                       EHALT                   ;PRIORITY LOGIC
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 0155  PSID
01 14454 006230          JSR@    IERR?
02 14455 006231          LOOPX
03 14456 006226 T091:    JSR@    IENT?           ;SET DONE ON RECEIVER 0 AND
04 14457 000005          5
05 14460 062677          IORST
06                       MODEM   OFF
07 14461 020101          LDA     0,RECADR        ;OUTPUT MODEM CONTROL
08 14462 061034          DOA     0,MUX           ;WORD
09 14463 024067          LDA     1,OFF
10 14464 066034          DOB     1,MUX
11 14465 020103          LDA     0,ORADR
12 14466 061034          DOA     0,MUX
13 14467 020067          LDA     0,OFF
14 14470 062034          DOB     0,MUX
15 14471 020102          LDA     0,TRADR         ;RECEIVER 1- SEE THAT BOTH DO
16 14472 061034          DOA     0,MUX           ;NOT CLEAR WHEN RECO CLEARED
17 14473 152520          SUBZL   2,2
18 14474 073034          DOC     2,MUX
19                       LCS     LOOPBACK,NOPARITY,CODE8
20 14475 006120          JSR     @.LINCH         ;OUTPUT LINE CHARACTERISTICS
21 14476 100031          100000+LOOPBACK+NOPARITY+CODE8
22 14477 020104          LDA     0,OTADR
23 14500 061034          DOA     0,MUX
24 14501 073034          DOC     2,MUX
25                       LCS     LOOPBACK,NOPARITY,CODE8
26 14502 006120          JSR     @.LINCH         ;OUTPUT LINE CHARACTERISTICS
27 14503 100031          100000+LOOPBACK+NOPARITY+CODE8
28                       XCLK    C1
29 14504 020235          LDA     0,C1
30 14505 006123          JSR     @.STEP
31                       RECEIVER
32 14506 020101          LDA     0,RECADR
33 14507 061034          DOA     0,MUX           ;ENABLE RECEIVER
34 14510 126520          SUBZL   1,1
35 14511 067034          DOC     1,MUX           ;START RECEIVER
36 14512 020103          LDA     0,ORADR
37 14513 061034          DOA     0,MUX
38 14514 067034          DOC     1,MUX
39                       MUXCLKA C1
40 14515 020235          LDA     0,C1
41 14516 006121          JSR     @ICONT
42                       X.CLK   30.
43 14517 030363          LDA     2,CM30.
44                       XCLK    C1
45 14520 020235          LDA     0,C1
46 14521 006123          JSR     @.STEP
47                       MUXCLKA C5
48 14522 020241          LDA     0,C5
49 14523 006121          JSR     @ICONT
50 14524 151404          INC     2,2,SZR
51 14525 000773          JMP     .-5
52 14526 020104          LDA     0,OTADR
53 14527 061034          DOA     0,MUX
54 14530 024314          LDA     1,C252
55 14531 066034          DOB     1,MUX
56 14532 020102          LDA     0,TRADR
57 14533 061034          DOA     0,MUX
58 14534 066034          DOB     1,MUX
59                       X.CLK   18.
60 14535 030362          LDA     2,CM18.
```

```
 0156  PSID
01                        XCLK    C1
02 14536 020235           LDA     0,C1
03 14537 006123           JSR     @.STEP
04                        MUXCLKA C5
05 14540 020241           LDA     0,C5
06 14541 006121           JSR     @ICONT
07 14542 151404           INC     2,2,SZR
08 14543 000773           JMP     .-5
09 14544 060434           DIA     0,MUX
10 14545 065634           DIBC    1,MUX
11 14546 101100           MOVL    0,0             ;DUMMY INSTRUCTION
12 14547 060434           DIA     0,MUX
13 14550 101232           MOVZR#  0,0,SZC         ;NEXT DONE SHOULD BE OTHER
14                                                ;RECEIVER
15                        EHALT                   ;CHECK SCAN ADDR 7 AND -(SCAN ADDR 7) TO
16 14551 006230           JSR@    IERR?
17 14552 006231           LOOPX                   ; REC0 AND REC1
18 14553 006226 T093:     JSR@    IENT?           ;CHECK OPPOSITE LINE CODING
19 14554 000005           5
20 14555 062677           IORST
21                        XMIT                    ;SET DONE ON LINE 0
22 14556 020102           LDA     0,TRADR         ;TURN ON TRANSMITTER
23 14557 061034           DOA     0,MUX
24 14560 102520           SUBZL   0,0             ;THIS SETS DONE
25 14561 063034           DOC     0,MUX
26                        MUXCLKA C1
27 14562 020235           LDA     0,C1
28 14563 006121           JSR     @ICONT
29 14564 060634           DIAC    0,MUX
30 14565 101000           MOV     0,0
31 14566 063734           SKPDZ   MUX             ;ANY DONES LEFT?
32                        EHALT                   ;YES, SCAN ADDR 7 TO XMT SEL 1
33 14567 006230           JSR@    IERR?
34 14570 006231           LOOPX
35
36 14571 006226 T094:     JSR@    IENT?           ;CHECK MODEM IS NOT CLEARED
37 14572 000005           5
38 14573 062677           IORST
39                                                ;WHEN RECEIVER SHOULD BE
40                        TRANSMIT        LOOPBACK,NOPARITY,CODE8
41 14574 006155           JSR@    ITRMT
42 14575 100031 100000+LOOPBACK+NOPARITY+CODE8
43 14576 030101           LDA     2,RECADR
44 14577 071034           DOA     2,MUX
45 14600 063234           DOCC    0,MUX
46 14601 126400           SUB     1,1
47 14602 125404           INC     1,1,SZR
48 14603 000777           JMP     .-1
49 14604 063634           SKPDN   MUX
50 14605 000777           JMP     .-1
51 14606 060434           DIA     0,MUX           ;CLEAR TRANSMITTER
52 14607 024314           LDA     1,C252
53 14610 066234           DOBC    1,MUX
54 14611 101100           MOVL    0,0             ;DUMMY INSTRUCTION
55 14612 063634           SKPDN   MUX
56 14613 000777           JMP     .-1
57 14614 060434           DIA     0,MUX
58 14615 101222           MOVZR   0,0,SZC
59 14616 000772           JMP     .-6
60 14617 024066           LDA     1,DTR           ;SET MODEM DONE
```

```
 0157  PSID
01 14620 066034          DOB     1,MUX
02 14621 061634          DIBC    0,MUX           ;CLEAR RECEIVER
03 14622 063634          SKPDN   MUX
04 14623 000777          JMP     .-1
05 14624 060634          DIAC    0,MUX
06 14625 101222          MOVZR   0,0,SZC         ;WAIT FOR NON-XMIT DONE
07 14626 000774          JMP     .-4
08 14627 061434          DIB     0,MUX
09 14630 062434          DIC     0,MUX
10 14631 101233          MOVZR#  0,0,SNC
11                       EHALT                   ;RCV STAT TO MCLR,
12 14632 006230          JSR@    IERR?
13 14633 006231          LOOPX
14 14634 020114 CRC1:    LDA     0,CRCOP
15 14635 101005          MOV     0,0,SNR         ;IS CRC OPTION SELECTED?
16 14636 002402          JMP@    .+2             ;NO
17 14637 000402          JMP     .+2             ;YES
18 14640 016033          ENDC
19 14641 024103          LDA     1,ORADR
20 14642 065034          DOA     1,MUX           ;SETUP ALTERNATE LINE CHARACTER.
21 14643 024341          LDA     1,C100K
22 14644 067034          DOC     1,MUX
23 14645 024075          LDA     1,BDADR         ;GET THE PRESENT
24 14646 065034          DOA     1,MUX           ;BOARD ADDRESS.
25 14647 024342          LDA     1,C101K
26 14650 067034          DOC     1,MUX
27
28
29 14651 006226 CRC2:    JSR@    IENT?           ;TEST REMAINDER REGISTERS
30 14652 000005          5
31 14653 062677          IORST
32 14654 102000          ADC     0,0             ;DOA & DIB BY LOADING
33 14655 126000          ADC     1,1             ;AND UNLOADING 1'S.
34 14656 066035          DOB     1,CRC
35 14657 071435          DIB     2,CRC
36 14660 151005          MOV     2,2,SNR
37                       EHALT                   ;EITHER (DOB) OR (DIB) ON CRC
38 14661 006230          JSR@    IERR?
39                                               ;FAILED TO ASSERT OR 4015
40                                               ;REGISTERS FAILED TO FORCE LOAD.
41                                               ;CHECK OC GATES AND DRIVER LINES.
42 14662 006231          LOOPX
43
44
45 14663 006226 CRC3:    JSR@    IENT?           ;TEST REMAINDER REGISTERS
46 14664 000005          5
47 14665 062677          IORST
48 14666 102000          ADC     0,0             ;BY LOADING & UNLOADING 1'S.
49 14667 126000          ADC     1,1
50 14670 060235          NIOC    CRC
51 14671 066035          DOB     1,CRC
52 14672 071435          DIB     2,CRC
53 14673 132414          SUB#    1,2,SZR
54                       EHALT                   ;BITS LO IN AC2 ARE REMAINDER
55 14674 006230          JSR@    IERR?
56                                               ;BITS HELD LO ON CRC.
57                                               ;CHECK 4015 LINES,
58                                               ;INPUT AND OUTPUT LINES.
59 14675 006231          LOOPX
60
```

```
 0158  PSID
01 14676 006226 CRC4:   JSR@    IENT?           ;CHECK IF CRC CLEAR WORKS.
02 14677 000005         5
03 14700 062677         IORST
04 14701 102000         ADC     0,0
05 14702 126000         ADC     1,1
06 14703 066035         DOB     1,CRC
07 14704 060235         NIOC    CRC
08 14705 071435         DIB     2,CRC
09 14706 151004         MOV     2,2,SZR
10                      EHALT                   ;NIOC   FAILED TO CLEAR
11 14707 006230         JSR@    IERR?
12                                              ;CRC REMAINDER REGISTER.
13                                              ;AC2 CONTAINS DATA IN (SHOULD = 0)
14                                              ;CHECK (FCLEAR) OC DRIVER & LINES.
15                                              ;(DOB)HELD LOW,
16                                              ;DATA BITS HELD HIGH.
17 14710 006231         LOOPX
18
19 14711 006226 CRC4A:  JSR@    IENT?           ;CHECK THAT CLEAR TO ANOTHER
20 14712 000005         5
21 14713 062677         IORST
22 14714 102000         ADC     0,0             ;DEVICE WON'T CLEAR CRC.
23 14715 126000         ADC     1,1
24 14716 066035         DOB     1,CRC
25 14717 060234         NIOC    MUX
26 14720 071435         DIB     2,CRC
27 14721 151005         MOV     2,2,SNR
28                      EHALT                   ;CLEAR TO MUX SEL CLEARED CRC.
29 14722 006230         JSR@    IERR?
30                                              ;CHECK OC GATES AND (CRC).
31                                              ;TRACE BACK LINES DRIVEN.
32 14723 006231         LOOPX
33
34 14724 006226 CRC5:   JSR@    IENT?           ;CHECK BUSY OPERATION
35 14725 000005         5
36 14726 062677         IORST
37 14727 102000         ADC     0,0
38 14730 126440         SUBO    1,1
39 14731 066135         DOBS    1,CRC
40 14732 060335         NIOP    CRC
41 14733 063435         SKPBN   CRC
42                      EHALT                   ;BUSY FAILED TO SET ON
43 14734 006230         JSR@    IERR?
44                                              ;START OF CRC.
45                                              ;CHECK (COMPUTE) SETS.
46                                              ;CHECK OC DRIVER, FF
47                                              ;AND SR OF (MUX CLKA).
48 14735 006231         LOOPX
49
50 14736 006226 CRC6:   JSR@    IENT?           ;CHECK MUX CLKA OPERATES CRC
51 14737 000005         5
52 14740 062677         IORST
53 14741 024351         LDA     1,CM8.          ;AT ALL.
54 14742 020074         LDA     0,RBYT
55 14743 060235         NIOC    CRC
56 14744 062034         DOB     0,MUX
57 14745 102000         ADC     0,0
58 14746 060135         NIOS    CRC
59 14747 060335 CRC6A:  NIOP    CRC
60 14750 125404         INC     1,1,SZR
```

```
 0159  PSID
01 14751 000776          JMP     CRC6A
02 14752 071435          DIB     2,CRC
03 14753 151005          MOV     2,2,SNR
04                       EHALT                   ;DATA FAILED TO REACH
05 14754 006230          JSR@    IERR?
06                                               ;CRC REMAINDER REGISTER
07                                               ;AT ALL.
08                                               ;CHECK S/L & CKINH INPUT
09                                               ;ON 74165,
10                                               ;CHECK CP ON 4015'S.
11                                               ;CHECK (FEED), ITS FF,
12                                               ;DRIVER XOR, (MUX CLKA),
13                                               ;& 74165 DATA BUFFER OUT.
14 14755 006231          LOOPX
15
16
17
18
19 14756 006226 CRC7:    JSR@    IENT?           ;SEND OUT ALL 1'S TO
20 14757 000005          5
21 14760 062677          IORST
22 14761 000402          JMP     .+2     ;CRC DATA BUFFER.
23 14762 000000          0
24 14763 020255          LDA     0,C10
25 14764 040776          STA     0,CRC7+4
26 14765 020074          LDA     0,RBYT
27 14766 126440          SUBO    1,1
28 14767 060235          NIOC    CRC
29 14770 062034          DOB     0,MUX
30 14771 060135          NIOS    CRC
31 14772 024341          LDA     1,C100K
32 14773 102440          SUBO    0,0
33 14774 060335          NIOP    CRC
34 14775 060335 CRC7A:   NIOP    CRC
35 14776 101400          INC     0,0
36 14777 071435          DIB     2,CRC
37 15000 060235          NIOC    CRC
38 15001 133415          AND#    1,2,SNR
39                       EHALT                   ;SOME 1'S FAILED TO MAKE CRC
40 15002 006230          JSR@    IERR?
41                                               ;REMAINDER REGISTER.
42                                               ;AC0 = XTH SHIFT OF 8 FAILING
43                                               ;1 = BIT 8, 2=9, 3=10, 4=11, 5=12,
44                                               ; 6=13, 7=14, 8=15
45                                               ;AC2 = BIT RECEIVED
46                                               ;CHECK 74165 DATA LINES OPEN
47                                               ;AND OUTPUT LINES OPEN.
48                                               ;CHECK XOR 1,4,11,14 LINES OPEN.
49                                               ;IF 2'ND SHIFT FAILED
50                                               ;CHECK (POLY 0) HELD LOW.
51
52 15003 014757          DSZ     CRC7+4
53 15004 000402          JMP     .+2
54 15005 000404          JMP     .+4
55 15006 063435          SKPBN   CRC
56                       EHALT                   ;BUSY CLEARED BEFORE CRC
57 15007 006230          JSR@    IERR?
58                                               ;WAS DONE 8 CYCLES.
59                                               ;CHECK COMPUTE & ASSOCIATED
60                                               ;GATES & DRIVERS.
```

```
 0160  PSID
01 15010 000765          JMP     CRC7A
02 15011 063535          SKPBZ   CRC
03                       EHALT                   ;BUSY FAILED TO CLEAR
04 15012 006230          JSR@    IERR?
05                                               ;AT END OF 8 CYCLES
06                                               ;OF MUX CLKA.
07                                               ;CHECK COMPUTE OR CRC
08                                               ;HELD HI.
09 15013 102000          ADC     0,0
10 15014 006231          LOOPX
11 15015 000403          JMP     CRC8
12 15016 125252 CRK12:   125252
13 15017 052525 CRK15:   52525
14
15
16
17
18 15020 006226 CRC8:    JSR@    IENT?           ;SEND OUT ALL 0'S TO
19 15021 000005          5
20 15022 062677          IORST
21 15023 000402          JMP     .+2             ;CRC DATA BUFFER.
22 15024 000000          0
23 15025 020255          LDA     0,C10
24 15026 040776          STA     0,CRC8+4
25 15027 102440          SUBO    0,0
26 15030 126440          SUBO    1,1
27 15031 060235          NIOC    CRC
28 15032 062034          DOB     0,MUX
29 15033 060135          NIOS    CRC
30 15034 060335 CRC8A:   NIOP    CRC
31 15035 024341          LDA     1,C100K
32 15036 101400          INC     0,0
33 15037 071435          DIB     2,CRC
34 15040 060235          NIOC    CRC
35 15041 133414          AND#    1,2,SZR
36                       EHALT                   ;SOME 0'S FAILED TO MAKE
37 15042 006230          JSR@    IERR?
38                                               ;CRC REMAINDER REGISTER
39                                               ;AC2 SHOULD = 0
40                                               ;AC0 = XTH SHIFT OF 8 FAILING
41                                               ;1 = BIT 8, 2=9, 3=10, ETC.
42                                               ;CHECK 74165 OPERATION FOR DATA
43                                               ;INPUT LINES HELD HI.
44                                               ;CHECK (FEED) HELD HIGH.
45 15043 014761          DSZ     CRC8+4
46 15044 000770          JMP     CRC8A
47 15045 102000          ADC     0,0
48 15046 006231          LOOPX
49
50 15047 006226 CRC9:    JSR@    IENT?           ;CHECK CRC REMAINDER REGISTER
51 15050 000005          5
52 15051 062677          IORST
53 15052 020744          LDA     0,CRK12         ;WILL SHIFT PROPERLY ON MUX CLKA.
54 15053 024744          LDA     1,CRK15
55 15054 152440          SUBO    2,2
56 15055 060235          NIOC    CRC
57 15056 072034          DOB     2,MUX
58 15057 062135          DOBS    0,CRC
59 15060 060335          NIOP    CRC
60 15061 060335          NIOP    CRC
```

```
 0161  PSID
01 15062 071435          DIB     2,CRC
02 15063 132415          SUB#    1,2,SNR
03 15064 000403          JMP     .+3
04 15065 143400          AND     2,0
05                       EHALT           ;CRC REMAINDER REGISTER FAILED
06 15066 006230          JSR@    IERR?
07                               ;TO SHIFT PROPERLY.
08                               ;AC2 CONTAINS DATA READ BACK
09                               ;AC0 CONTAINS BITS NOT SHIFTED PROPERLY
10                               ;CHECK CROSS COUPLING OF (T1)-(T15)
11                               ;(XOR1,11) = 0, (XOR4,14) = 1 ON SHIFT
12                               ;IF NOT THESE CHECK (T15) = 0
13                               ;AND (FEED) = 0.
14 15067 006231          LOOPX
15
16
17
18
19 15070 006226 CRC9A:   JSR@    IENT?           ;CHECK (MUX CLKA) SHIFTS
20 15071 000005          5
21 15072 062677          IORST
22 15073 000402          JMP     .+2     ;ON 40165 WITH
23 15074 000000          0               ;ALTERNATING 1'S & 0'S.
24 15075 024240          LDA     1,C4
25 15076 044776          STA     1,CRC9A+4
26 15077 024302          LDA     1,C125
27 15100 102440          SUBO    0,0
28 15101 060235          NIOC    CRC
29 15102 066034          DOB     1,MUX
30 15103 062135          DOBS    0,CRC
31 15104 060335          NIOP    CRC
32 15105 060335 CR9A:    NIOP    CRC
33 15106 071435          DIB     2,CRC
34 15107 151005          MOV     2,2,SNR
35                       EHALT           ;CRC FAILED ON SHIFTING
36 15110 006230          JSR@    IERR?
37                               ;A 1 TO CRC REMAINDER
38                               ;REGISTER.
39                               ;CHECK 74165 DATA LINES.
40 15111 060235          NIOC    CRC
41 15112 060335          NIOP    CRC
42 15113 071435          DIB     2,CRC
43 15114 060235          NIOC    CRC
44 15115 151004          MOV     2,2,SZR
45                       EHALT           ;CRC FAILED ON SHIFTING
46 15116 006230          JSR@    IERR?
47                               ;A 0 TO CRC REMAINDER
48                               ;REGISTER.
49                               ;CHECK (MUX CLKA) IS OPERATING
50                               ;ON 74165 TO IMPLEMENT SHIFT.
51                               ;CHECK DATA LINES ON 74165 WORK.
52 15117 014755          DSZ     CRC9A+4
53 15120 000765          JMP     CR9A
54 15121 102000          ADC     0,0
55 15122 006231          LOOPX
56
57
58
59
60 15123 006226 CRC10:   JSR@    IENT?           ;CHECK ALGORITHM WITH 0'S
```

```
 0162  PSID
01 15124 000005          5
02 15125 062677          IORST
03 15126 000402          JMP     .+2      ;TO BOTH DATA REGISTER AND
04 15127 000000          0                ;REMAINDER REGISTER
05 15130 024347          LDA     1,CM2
06 15131 044423          STA     1,CR10B+3
07 15132 030341          LDA     2,C100K
08 15133 102440          SUBO    0,0
09 15134 024255          LDA     1,C10
10 15135 044772          STA     1,CRC10+4
11 15136 126440          SUBO    1,1
12 15137 073034          DOC     2,MUX
13 15140 066034          DOB     1,MUX
14 15141 060235          NIOC    CRC
15 15142 060135          NIOS    CRC
16 15143 060335          NIOP    CRC
17 15144 060335 CR10A:   NIOP    CRC
18 15145 101400          INC     0,0
19 15146 065435          DIB     1,CRC
20 15147 125004          MOV     1,1,SZR
21                       EHALT            ;ALGORITHM FAILED ON 0'S
22 15150 006230          JSR@    IERR?
23                                        ;AC1 CONTAINS RESULT IN
24                                        ;CRC REMAINDER REGISTER.
25                                        ;AC0 CONTAINS XTH SHIFT OF
26                                        ;8 IN WHICH FAILURE OCCURRED.
27                                        ;CHECK FAILING BITS AGAINST
28                                        ;CRC XOR GATES AND CODES.
29 15151 014756 CR10B:   DSZ     CRC10+4
30 15152 000772          JMP     CR10A
31 15153 000402          JMP     .+2
32 15154 000000          0
33 15155 010777          ISZ     .-1
34 15156 000402          JMP     .+2
35 15157 000403          JMP     .+3
36 15160 030342          LDA     2,C101K
37 15161 000752          JMP     CR10A-11
38 15162 102000          ADC     0,0
39 15163 006231          LOOPX
40 15164 000402          JMP     CRC11
41
42
43
44
45 15165 015175          CRC1Q+4
46 15166 006226 CRC11:   JSR@    IENT?            ;CHECK ALGORITHM WITH 0'S
47 15167 000005          5
48 15170 062677          IORST
49 15171 000403 CRC1Q:   JMP     .+3      ;FOR REMAINDER REGISTER
50 15172 000000          0                ;& 1'S FOR DATA REGISTER.
51 15173 000000          0
52 15174 000421          JMP     .+21
53                                        ;1'ST STACK POLYN 0
54 15175 120001          120001           ;1 010 000 000 000 001
55 15176 050000          050000           ;0 101 000 000 000 000
56 15177 104001          104001           ;1 000 100 000 000 001
57 15200 042000          042000           ;0 100 010 000 000 000
58 15201 101001          101001           ;1 000 001 000 000 001
59 15202 040400          040400           ;0 100 000 100 000 000
60 15203 100201          100201           ;1 000 000 010 000 001
```

```
 0163  PSID
01 15204 040100          040100          ;0 100 000 001 000 000
02                                       ;2'ND STACK POLYN 1
03 15205 102010          102010          ;1 000 010 000 001 000
04 15206 143014          143014          ;1 100 011 000 001 100
05 15207 163416          163416          ;1 110 011 100 001 110
06 15210 173617          173617          ;1 111 011 110 001 111
07 15211 075707          075707          ;0 111 101 111 000 111
08 15212 036743          036743          ;0 011 110 111 100 011
09 15213 017361          017361          ;0 001 111 011 110 001
10 15214 007570          007570          ;0 000 111 101 111 000
11
12
13
14
15
16
17 15215 024750          LDA     1,CRC11-1
18 15216 044755          STA     1,CRC1Q+2
19 15217 030347          LDA     2,CM2
20 15220 050437          STA     2,CR11B+4
21 15221 030341          LDA     2,C100K
22 15222 102440          SUBO    0,0
23 15223 024074          LDA     1,RBYT
24 15224 073034          DOC     2,MUX
25 15225 066034          DOB     1,MUX
26 15226 060235          NIOC    CRC
27 15227 060135          NIOS    CRC
28 15230 030255          LDA     2,C10
29 15231 050741          STA     2,CRC1Q+1
30 15232 060335          NIOP    CRC
31 15233 060335 CR11A:   NIOP    CRC
32 15234 101400          INC     0,0
33 15235 071435          DIB     2,CRC
34 15236 026735          LDA     1,@CRC1Q+2
35 15237 132415          SUB#    1,2,SNR
36 15240 000413          JMP     .+13
37 15241 000403          JMP     .+3
38 15242 000000          0
39 15243 000000          0
40 15244 040777          STA     0,.-1
41 15245 044775          STA     1,.-3
42 15246 141000          MOV     2,0
43                       XOR.
44 15247 006124          JSR     @.XOR           ;"XOR" AC0 WITH AC1
45 15250 020773          LDA     0,.-5
46 15251 030771          LDA     2,.-7
47
48                       EHALT           ;ALGORITHM FAILED ON 1'S
49 15252 006230          JSR@    IERR?
50                                       ;SHIFTING FROM DATA REGISTER.
51                                       ;AC0 = XTH OF 8 CYCLES.
52                                       ;AC1 = BITS IN ERROR.
53                                       ;AC2 CONTAINS DATA EXPECTED.
54                                       ;CHECK XOR GATES AND
55                                       ;DATA LINES FEEDING
56                                       ;TO AND FROM THEM.
57                                       ;(SEE ABOVE TABLES FOR THE
58                                       ;FOLLOWING IF ERROR = 022011)
59                                       ;IF ON 1'ST # OF 1'ST STACK POLYN 0
60                                       ;CHECK (POLY 0) HELD HIGH.
```

```
 0164  PSID
01                                        ;IF ON 1'ST # OF 2'ND STACK POLYN 1
02                                        ;CHECK (POLY 0) HELD LOW.
03 15253 010720 CR11B:  ISZ     CRC1Q+2
04 15254 014716         DSZ     CRC1Q+1
05 15255 000756         JMP     CR11A
06 15256 000402         JMP     .+2
07 15257 000000         0
08 15260 010777         ISZ     .-1
09 15261 000402         JMP     .+2
10 15262 000403         JMP     .+3
11 15263 030342         LDA     2,C101K
12 15264 000736         JMP     CR11A-11
13 15265 006231         LOOPX
14 15266 000402         JMP     CRC12
15
16 15267 015277         CRC2Q+4
17 15270 006226 CRC12:  JSR@    IENT?   ;CHECK ALGORITHM WITH 1'S
18 15271 000005         5
19 15272 062677         IORST
20 15273 000403 CRC2Q:  JMP     .+3     ;FOR REMAINDER REGISTER
21 15274 000000         0               ;& 0'S FOR DATA REGISTER.
22 15275 000000         0
23 15276 000421         JMP     .+21
24                                        ;1'ST STACK POLYN 0
25 15277 157776         157776          ;1 101 111 111 111 110
26 15300 067777         067777          ;0 110 111 111 111 111
27 15301 113776         113776          ;1 001 011 111 111 110
28 15302 045777         045777          ;0 100 101 111 111 111
29 15303 102776         102776          ;1 000 010 111 111 110
30 15304 041377         041377          ;0 100 001 011 111 111
31 15305 100576         100576          ;1 000 000 101 111 110
32 15306 040277         040277          ;0 100 000 010 111 111
33                                        ;2'ND STACK POLYN 1
34 15307 175767         175767          ;1 111 101 111 110 111
35 15310 174763         174763          ;1 111 100 111 110 011
36 15311 174361         174361          ;1 111 100 011 110 001
37 15312 174160         174160          ;1 111 100 001 110 000
38 15313 076070         076070          ;0 111 110 000 111 000
39 15314 037034         037034          ;0 011 111 000 011 100
40 15315 017416         017416          ;0 001 111 100 001 110
41 15316 007607         007607          ;0 000 111 110 000 111
42
43
44 15317 024750         LDA     1,CRC12-1
45 15320 044755         STA     1,CRC2Q+2
46 15321 030347         LDA     2,CM2
47 15322 050433         STA     2,CR12B+4
48 15323 030341         LDA     2,C100K
49 15324 102440         SUBO    0,0
50 15325 126000         ADC     1,1
51 15326 073034         DOC     2,MUX
52 15327 062034         DOB     0,MUX
53 15330 066135         DOBS    1,CRC
54 15331 030255         LDA     2,C10
55 15332 050742         STA     2,CRC2Q+1
56 15333 060335         NIOP    CRC
57 15334 060335 CR12A:  NIOP    CRC
58 15335 101400         INC     0,0
59 15336 071435         DIB     2,CRC
60 15337 026736         LDA     1,@CRC2Q+2
```

```
 0165  PSID
01 15340 132415          SUB#    1,2,SNR
02 15341 000410          JMP     .+10
03 15342 000402          JMP     .+2
04 15343 000000          0
05 15344 040777          STA     0,.-1
06 15345 141000          MOV     2,0
07                       XOR.
08 15346 006124          JSR     @.XOR           ;"XOR" AC0 WITH AC1
09 15347 020774          LDA     0,.-4
10                       EHALT           ;ALGORITHM FAILED ON 0'S
11 15350 006230          JSR@    IERR?
12                                       ;SHIFTING FROM DATA REGISTER.
13                                       ;AC0 = XTH OF 8 CYCLES.
14                                       ;AC1 = BITS IN ERROR.
15                                       ;CHECK XOR  GATES AND
16                                       ;DATA LINES FEEDING
17                                       ;TO & FROM THEM.
18 15351 010724 CR12B:   ISZ     CRC2Q+2
19 15352 014722          DSZ     CRC2Q+1
20 15353 000761          JMP     CR12A
21 15354 000402          JMP     .+2
22 15355 000000          0
23 15356 010777          ISZ     .-1
24 15357 000402          JMP     .+2
25 15360 000403          JMP     .+3
26 15361 030342          LDA     2,C101K
27 15362 000742          JMP     CR12A-10
28 15363 006231          LOOPX
29
30
31 15364 000402          JMP     CRC13
32 15365 015375          CRC3Q+4
33 15366 006226 CRC13:   JSR@    IENT?           ;CHECK ALGORITHM WITH 1'S
34 15367 000005          5
35 15370 062677          IORST
36 15371 000403 CRC3Q:   JMP     .+3     ;TO BOTH REMAINDER REGISTER
37 15372 000000          0               ;AND DATA REGISTER.
38 15373 000000          0
39 15374 000421          JMP     .+21
40                                       ;1'ST STACK POLYN 0
41 15375 077777          077777          ;0 111 111 111 111 111
42 15376 037777          037777          ;0 011 111 111 111 111
43 15377 017777          017777          ;0 001 111 111 111 111
44 15400 007777          007777          ;0 000 111 111 111 111
45 15401 003777          003777          ;0 000 011 111 111 111
46 15402 001777          001777          ;0 000 001 111 111 111
47 15403 000777          000777          ;0 000 000 111 111 111
48 15404 000377          000377          ;0 000 000 011 111 111
49                                       ;2'ND STACK POLYN 1
50 15405 077777          077777
51 15406 037777          037777
52 15407 017777          017777
53 15410 007777          007777
54 15411 003777          003777
55 15412 001777          001777
56 15413 000777          000777
57 15414 000377          000377
58
59
60
```

```
 0166  PSID
01 15415 024750          LDA     1,CRC13-1
02 15416 044755          STA     1,CRC3Q+2
03 15417 030347          LDA     2,CM2
04 15420 050434          STA     2,CR13B+4
05 15421 030341          LDA     2,C100K
06 15422 073034          DOC     2,MUX
07 15423 024074          LDA     1,RBYT
08 15424 066034          DOB     1,MUX
09 15425 102000          ADC     0,0
10 15426 062135          DOBS    0,CRC
11 15427 030255          LDA     2,C10
12 15430 050742          STA     2,CRC3Q+1
13 15431 102440          SUBO    0,0
14 15432 060335          NIOP    CRC
15 15433 060335 CR13A:   NIOP    CRC
16 15434 101400          INC     0,0
17 15435 071435          DIB     2,CRC
18 15436 026735          LDA     1,@CRC3Q+2
19 15437 132415          SUB#    1,2,SNR
20 15440 000410          JMP     .+10
21 15441 000402          JMP     .+2
22 15442 000000          0
23 15443 040777          STA     0,.-1
24 15444 141000          MOV     2,0
25                       XOR.
26 15445 006124          JSR     @.XOR           ;"XOR" AC0 WITH AC1
27 15446 020774          LDA     0,.-4
28                       EHALT           ;ALGORITHM FAILED ON 1'S
29 15447 006230          JSR@    IERR?
30                                       ;SHIFTING FROM DATA REGISTER.
31                                       ;AC0 = XTH OF 8 CYCLES.
32                                       ;AC1 = BITS IN ERROR.
33                                       ;CHECK XOR GATES AND
34                                       ;DATA LINES FEEDING
35                                       ;TO & FROM THEM.
36 15450 010723 CR13B:   ISZ     CRC3Q+2
37 15451 014721          DSZ     CRC3Q+1
38 15452 000761          JMP     CR13A
39 15453 000402          JMP     .+2
40 15454 000000          0
41 15455 010777          ISZ     .-1
42 15456 000402          JMP     .+2
43 15457 000403          JMP     .+3
44 15460 030342          LDA     2,C101K
45 15461 000741          JMP     CR13A-11
46 15462 006231          LOOPX
47
48
49
50 15463 006226 CRC14:   JSR@    IENT?           ;RUN ALGORITHM ON LINE
51 15464 000005          5
52 15465 062677          IORST
53 15466 024347          LDA     1,CM2   ;0'S IN BOTH REGISTERS.
54 15467 044415          STA     1,CR14A+1
55 15470 102000          ADC     0,0
56 15471 030341          LDA     2,C100K
57 15472 126440          SUBO    1,1
58 15473 060234          NIOC    MUX
59 15474 073034          DOC     2,MUX
60 15475 066034          DOB     1,MUX
```

```
 0167  PSID
01 15476 066235          DOBC    1,CRC           ;FOR DUAL AND SINGLE PORT
02 15477 060135          NIOS    CRC
03 15500 071435          DIB     2,CRC
04 15501 151004          MOV     2,2,SZR
05                       EHALT           ;ALGORITHM FAILED ON 0'S
06 15502 006230          JSR@    IERR?
07                               ;SHIFTED OUT.
08                               ;IF NO EARLIER FAILURES OFF LINE
09                               ;CHECK ( MUX CLKA) PULSES PILING UP
10                               ;XOR GATES FAILING IN TIME RESPONSE.
11 15503 000402 CR14A:   JMP     .+2
12 15504 000000          0
13 15505 010777          ISZ     .-1
14 15506 000402          JMP     .+2
15 15507 000403          JMP     .+3
16 15510 030342          LDA     2,C101K
17 15511 000761          JMP     CR14A-11
18 15512 102000          ADC     0,0
19 15513 006231          LOOPX
20 15514 000403          JMP     CRC15
21 15515 016000 YCR20:   CRC20
22 15516 015524          CRC5Q+2
23
24 15517 006226 CRC15:   JSR@    IENT?           ;RUN ALGORITHM ON LINE
25 15520 000005          5
26 15521 062677          IORST
27 15522 000404 CRC5Q:   JMP     .+4     ;WITH 0'S IN REMAINDER REGISTER
28 15523 000000          0               ;& 1'S IN DATA REGISTER.
29 15524 040100          040100
30 15525 007570          007570
31 15526 024770          LDA     1,CRC15-1
32 15527 044774          STA     1,CRC5Q+1
33 15530 024347          LDA     1,CM2
34 15531 044420          STA     1,CR15A+1
35 15532 030341          LDA     2,C100K
36 15533 020074          LDA     0,RBYT
37 15534 126440          SUBO    1,1
38 15535 060234          NIOC    MUX
39 15536 073034          DOC     2,MUX
40 15537 062034          DOB     0,MUX
41 15540 066235          DOBC    1,CRC           ;FOR DUAL AND SINGLE PORT
42 15541 060135          NIOS    CRC
43 15542 063535          SKPBZ   CRC             ;WAIT FOR CRC
44 15543 000777          JMP     .-1
45 15544 071435          DIB     2,CRC
46 15545 026756          LDA     1,@CRC5Q+1
47 15546 132414          SUB#    1,2,SZR
48
49
50
51
52
53                       EHALT           ;ALGORITHM FAILED ON 1'S
54 15547 006230          JSR@    IERR?
55                               ;SHIFTED OUT OF DATA REGISTER.
56                               ;AC1 = EXPECTED DATA
57                               ;AC2 = RECEIVED DATA
58                               ;CHECK (MUX CLKA) AND
59                               ;XOR GATES & LINES.
60 15550 000402 CR15A:   JMP     .+2
```

```
 0168  PSID
01 15551 000000          0
02 15552 010777          ISZ     .-1
03 15553 000402          JMP     .+2
04 15554 000404          JMP     .+4
05 15555 030342          LDA     2,C101K
06 15556 010745          ISZ     CRC15+4
07 15557 000754          JMP     CR15A-15
08 15560 006231          LOOPX
09
10
11 15561 020112          LDA     0,NLINE         ;SKIP IF ONE LINE ONLY
12 15562 101232          MOVZR#  0,0,SZC
13 15563 002732          JMP@    YCR20
14
15 15564 024342          LDA     1,C101K
16 15565 067034          DOC     1,MUX
17 15566 024103          LDA     1,ORADR
18 15567 065034          DOA     1,MUX
19 15570 000402          JMP     .+2
20
21 15571 015577 CX16:    CRC16+5
22 15572 006226 CRC16:   JSR@    IENT?           ;CHECK LINE 2 NOT FAILING.
23 15573 000005          5
24 15574 062677          IORST
25 15575 000404          JMP     .+4
26 15576 000000          0
27 15577 040100          040100
28 15600 007570          007570
29 15601 024770          LDA     1,CX16
30 15602 044774          STA     1,CRC16+4
31 15603 024347          LDA     1,CM2
32 15604 044420          STA     1,CR16A+1
33 15605 030341          LDA     2,C100K
34 15606 020074          LDA     0,RBYT
35 15607 126440          SUBO    1,1
36 15610 060234          NIOC    MUX
37 15611 073034          DOC     2,MUX
38 15612 062034          DOB     0,MUX
39 15613 066235          DOBC    1,CRC           ;FOR DUAL AND SINGLE PORT
40 15614 060135          NIOS    CRC
41 15615 063535          SKPBZ   CRC             ;WAIT FOR CRC
42 15616 000777          JMP     .-1
43 15617 071435          DIB     2,CRC
44 15620 026756          LDA     1,@CRC16+4
45 15621 132414          SUB#    1,2,SZR
46                       EHALT           ;CHECK (SCAN ADDR  7) HELD HIGH.
47 15622 006230          JSR@    IERR?
48                               ;CHECK LINES & SELECTION
49                               ;REGISTER TO POLYNOMIAL GATE.
50
51
52
53 15623 000402 CR16A:   JMP     .+2
54 15624 000000          0
55 15625 010777          ISZ     .-1
56 15626 000402          JMP     .+2
57 15627 000404          JMP     .+4
58 15630 030342          LDA     2,C101K
59 15631 010745          ISZ     CRC16+4
60 15632 000754          JMP     CR16A-15
```

```
 0169  PSID
01 15633 006231          LOOPX
02 15634 000402          JMP     .+2
03
04
05 15635 015643 CX17:    CRC17+5
06 15636 006226 CRC17:   JSR@    IENT?          ;CHECK LINE 2 NOT FAILING.
07 15637 000005          5
08 15640 062677          IORST
09 15641 000404          JMP     .+4
10 15642 000000          0
11 15643 040100          040100
12 15644 007570          007570
13 15645 024770          LDA     1,CX17
14 15646 044774          STA     1,CRC17+4
15 15647 024347          LDA     1,CM2
16 15650 044420          STA     1,CR17A+1
17 15651 030341          LDA     2,C100K
18 15652 020074          LDA     0,RBYT
19 15653 126440          SUBO    1,1
20 15654 060234          NIOC    MUX
21 15655 073034          DOC     2,MUX
22 15656 062034          DOB     0,MUX
23 15657 066235          DOBC    1,CRC          ;FOR DUAL AND SINGLE PORT
24 15660 060135          NIOS    CRC
25 15661 063535          SKPBZ   CRC            ;WAIT FOR CRC
26 15662 000777          JMP     .-1
27 15663 071435          DIB     2,CRC
28 15664 026756          LDA     1,@CRC17+4
29 15665 132414          SUB#    1,2,SZR
30                       EHALT           ;CHECK -(SCAN ADDR  7) HELD HIGH.
31 15666 006230          JSR@    IERR?
32                               ;CHECK LINES & SELECTION
33                               ;REGISTER TO POLYNOMIAL GATE.
34                               ;IF AC1 = 7570,
35                               ;CHECK (POLY 1) HELD LOW.
36                               ;IF AC1 = 40100,
37                               ;CHECK (POLY 1) HELD HIGH.
38 15667 000402 CR17A:   JMP     .+2
39 15670 000000          0
40 15671 010777          ISZ     .-1
41 15672 000402          JMP     .+2
42 15673 000404          JMP     .+4
43 15674 030342          LDA     2,C101K
44 15675 010745          ISZ     CRC17+4
45 15676 000754          JMP     CR17A-15
46                       LOOP
47 15677 006227          JSR     @ICYC?E        ;END OF SUBTEST
48
49 15700 000402          JMP     .+2
50
51
52
53 15701 015707 CX18:    CRC18+5
54 15702 006226 CRC18:   JSR@    IENT?          ;RUN ALGORITHM ON LINE
55 15703 000005          5
56 15704 062677          IORST
57 15705 000404          JMP     .+4
58 15706 000000          0
59 15707 040277          40277
60 15710 007607          7607
```

```
 0170  PSID
01 15711 024770          LDA     1,CX18
02 15712 044774          STA     1,CRC18+4
03 15713 024347          LDA     1,CM2
04 15714 044417          STA     1,CR18A+1
05 15715 030341          LDA     2,C100K
06 15716 102000          ADC     0,0
07 15717 126440          SUBO    1,1
08 15720 060234          NIOC    MUX
09 15721 073034          DOC     2,MUX
10 15722 066034          DOB     1,MUX
11 15723 062135          DOBS    0,CRC
12 15724 063535          SKPBZ   CRC             ;WAIT FOR CRC
13 15725 000777          JMP     .-1
14 15726 071435          DIB     2,CRC
15 15727 026757          LDA     1,@CRC18+4
16 15730 132414          SUB#    1,2,SZR
17                       EHALT           ;ALGORITHM FAILED ON 0'S
18 15731 006230          JSR@    IERR?
19                               ;SHIFTED OUT OF DATA REGISTER
20                               ;TO FULLY LOADED REMAINDER
21                               ;REGISTER.
22                               ;AC1 = EXPECTED DATA
23                               ;AC2 = RECEIVED DATA
24                               ;CHECK XOR GATES AND
25                               ;LINES FEEDING THEM.
26 15732 000402 CR18A:   JMP     .+2
27 15733 000000          0
28 15734 010752          ISZ     CRC18+4
29 15735 010776          ISZ     .-2
30 15736 000402          JMP     .+2
31 15737 000403          JMP     .+3
32 15740 030342          LDA     2,C101K
33 15741 000755          JMP     CR18A-14
34 15742 006231          LOOPX
35 15743 000402          JMP     .+2
36
37
38
39
40 15744 015752 CX19:    CRC19+5
41 15745 006226 CRC19:   JSR@    IENT?          ;RUN ALGORITHM ON LINE
42 15746 000005          5
43 15747 062677          IORST
44 15750 024347          LDA     1,CM2          ;WITH 1'S IN BOTH
45 15751 044420          STA     1,CR19A+1      ;REGISTERS.
46 15752 030341          LDA     2,C100K
47 15753 102000          ADC     0,0
48 15754 024074          LDA     1,RBYT
49 15755 060234          NIOC    MUX
50 15756 073034          DOC     2,MUX
51 15757 066034          DOB     1,MUX
52 15760 060235          NIOC    CRC
53 15761 062135          DOBS    0,CRC
54 15762 063535          SKPBZ   CRC             ;WAIT FOR CRC
55 15763 000777          JMP     .-1
56 15764 071435          DIB     2,CRC
57 15765 024326          LDA     1,C377
58 15766 132414          SUB#    1,2,SZR
59                       EHALT           ;ALGORITHM FAILED ON 1'S
60 15767 006230          JSR@    IERR?
```

```
 0171  PSID
01                                        ;SHIFTED OUT OF DATA REGISTER
02                                        ;TO A FULLY LOADED REMAINDER
03                                        ;REGISTER.
04                                        ;AC1 = EXPECTED DATA
05                                        ;AC2 = RECEIVED DATA
06                                        ;CHECK (MUX CLKA) AND XOR GATES.
07 15770 000402 CR19A:  JMP     .+2
08 15771 000000         0
09 15772 010777         ISZ     .-1
10 15773 000402         JMP     .+2
11 15774 000403         JMP     .+3
12 15775 030342         LDA     2,C101K
13 15776 000755         JMP     CR19A-15
14 15777 006231         LOOPX
15 16000 006226 CRC20:  JSR@    IENT?           ;RUN ALGORITHM ON LINE
16 16001 000005         5
17 16002 062677         IORST
18 16003 024347         LDA     1,CM2   ;WITH 1'S IN BOTH
19 16004 044420         STA     1,CR20A+1       ;REGISTERS
20 16005 030341         LDA     2,C100K
21 16006 102000         ADC     0,0
22 16007 024074         LDA     1,RBYT
23 16010 060234         NIOC    MUX
24 16011 073034         DOC     2,MUX
25 16012 066134         DOBS    1,MUX           ;SHOULD STILL RUN WHEN A
26 16013 060235         NIOC    CRC             ;START PULSE PUTS REST OF
27 16014 062135         DOBS    0,CRC           ;BOARD OFFLINE
28 16015 063535         SKPBZ   CRC             ;WAIT FOR CRC
29 16016 000777         JMP     .-1
30 16017 071435         DIB     2,CRC
31 16020 024326         LDA     1,C377
32 16021 132414         SUB#    1,2,SZR
33                      EHALT                   ;ALGORITHM FAILED ON 1'S
34 16022 006230         JSR@    IERR?
35                                        ;SHIFTED OUT OF DATA REGISTER
36                                        ;TO A FULLY LOADED REMAINDER
37                                        ;REGISTER
38                                        ;AC1=EXPECTED DATA
39                                        ;AC2=RECEIVED DATA
40                                        ;CHECK -(CLEAR MUX) TO ONLINE,
41                                        ;ONLINE FLOP
42 16023 000402 CR20A:  JMP     .+2
43 16024 000000         0
44 16025 010777         ISZ     .-1
45 16026 000402         JMP     .+2
46 16027 000403         JMP     .+3
47 16030 030342         LDA     2,C101K
48 16031 000755         JMP     CR20A-15
49 16032 006231         LOOPX
50 16033 102400 ENDC:   SUB     0,0
51 16034 040115         STA     0,CRCF
52                      MODEM   OFF             ;TURN EVERYTHING OFF
53 16035 020101         LDA     0,RECADR        ;OUTPUT MODEM CONTROL
54 16036 061034         DOA     0,MUX           ;WORD
55 16037 024067         LDA     1,OFF
56 16040 066034         DOB     1,MUX
57 16041 020103         LDA     0,ORADR
58 16042 061034         DOA     0,MUX
59 16043 066034         DOB     1,MUX
60 16044 014412         DSZ     DLPM
```

```
 0172  PSID
01 16045 002410          JMP     @.BACK
02 16046 010127          ISZ     PASS
03 16047 000401          JMP     .+1
04
05 16050 020407          LDA     0,DLPR0
06 16051 040405          STA     0,DLPM
07 16052 006215          JSR     @IMES?
08 16053 016614          TXTPS
09 16054 002401          JMP     @.BACK
10
11 16055 000737 .BACK:   BEG5
12
13 16056 000001 DLPM:    1
14 16057 000001 DLPR0:   1                       ;# OF PASSES
15 16060 000000 0
16 16061 054777 CHRA:    STA     3,.-1
17                       XCLK    C1
18 16062 020235          LDA     0,C1
19 16063 006123          JSR     @.STEP
20                       RECEIVER
21 16064 020101          LDA     0,RECADR
22 16065 061034          DOA     0,MUX           ;ENABLE RECEIVER
23 16066 126520          SUBZL   1,1
24 16067 067034          DOC     1,MUX           ;START RECEIVER
25                        MUXCLKA        C1
26 16070 020235          LDA     0,C1
27 16071 006121          JSR     @ICONT
28 16072 034766          LDA     3,CHRA-1
29 16073 031401          LDA     2,1,3
30 16074 150400          NEG     2,2
31                       XCLK    C1
32 16075 020235          LDA     0,C1
33 16076 006123          JSR     @.STEP
34                       MUXCLKA C5
35 16077 020241          LDA     0,C5
36 16100 006121          JSR     @ICONT
37 16101 151404          INC     2,2,SZR
38 16102 000773          JMP     .-5
39 16103 034755          LDA     3,CHRA-1
40 16104 025400          LDA     1,0,3
41 16105 066034          DOB     1,MUX
42 16106 031402          LDA     2,2,3
43 16107 150400          NEG     2,2             ;NEG IT
44                       XCLK    C1
45 16110 020235          LDA     0,C1
46 16111 006123          JSR     @.STEP
47                       MUXCLKA C5
48 16112 020241          LDA     0,C5
49 16113 006121          JSR     @ICONT
50 16114 151404          INC     2,2,SZR
51 16115 000773          JMP     .-5
52 16116 034742          LDA     3,CHRA-1        ;GET BACK RETURN
53 16117 001403          JMP     3,3
54               ;TRANSMIT SUBROUTINE
55 16120 020102 TRMT:    LDA     0,TRADR         ;GET TRANS ADDRESS
56 16121 061034          DOA     0,MUX           ;SELECT LINE
57 16122 021400          LDA     0,0,3           ;GET LINE SPEC
58 16123 063034          DOC     0,MUX           ;PUT IT OUT
59 16124 102520          SUBZL   0,0
60 16125 063034          DOC     0,MUX           ;START TRANSMITTER
```

```
 0173  PSID
01 16126 001401          JMP     1,3             ;RETURN
02
03 16127 000000 XXX:0                    ;TERMINATOR FOR DEV CHANGE
```

```
!0174  PSID
01                ;DCU AREA
02                ;RUN THE DCU THIS SECTION CONTAINS THE CODE FOR THE DCU
03                ;AND THE CODE FOR THE HOST TO RUN THE DCU
04 16130 000000 DST:0
05 16131 016132 DCUBF:   .+1              ;POINTER TO A BUFFER HOST CAN LOAD AND DCU
06 16132 000100          .BLK     100     ;CAN READ TO LOAD ITS LOW MEMORY
07
08                ;LOAD FIRST 4K OF HOST INTO BUFFER (100 WORDS AT A TIME)
09                ;AND LET DCU  READ THE WORDS AND LOAD ITS LOCAL MEMORY
10 16232 004427 .DCSTR:  JSR      DCUIN           ;INITALIZE DCU
11 16233 020277          LDA      0,C100
12 16234 040674          STA      0,DST           ;SET UP NUMBER OF TIMES TO LOAD BUFF
13 16235 152400          SUB      2,2             ;START AT HOST LOC 0
14
15 16236 034673 DCLOO:   LDA      3,DCUBF         ;GET BUFFER POINTER
16 16237 024433          LDA      1,CD.3          ;=-100
17 16240 021000          LDA      0,0,2           ;GET LOW CORE WORD
18 16241 041400          STA      0,0,3           ;STORE IN HIGH BUFFER
19 16242 151400          INC      2,2
20 16243 175400          INC      3,3
21 16244 125404          INC      1,1,SZR         ;END OF INNER LOOP?
22 16245 000773          JMP      DCLOO+2         ;NO
23
24 16246 004411          JSR      DCUMV           ;NOW LET DCU MOVE IT
25 16247 014661          DSZ      DST             ;EVERYTHING MOVED?
26 16250 000766          JMP      DCLOO           ;NO, MOVE SOME MORE
27
28 16251 020405          LDA      0,DCGOA         ;EVERTHING MOVED GET DCU START
29 16252 062076          DOB      0,DCU           ;PUT START DCU ADDRESS
30 16253 020236          LDA      0,C2
31 16254 061076          DOA      0,DCU           ;START DCU
32 16255 000454          JMP      HMON            ;WAIT FOR SOME RESPONSE
33 16256 016312 DCGOA:   DCUGO
34
35 16257 102520 DCUMV:   SUBZL    0,0             ;MAKE DCU CONT COMD
36 16260 000406          JMP      DCUWT           ;EXECUTE AND WAIT
37
38                ;INITIALIZE DCU
39 16261 062476 DCUIN:   DIC      0,DCU           ;SYS RESET DCU
40 16262 020411          LDA      0,CD.2
41 16263 163000          ADD      3,0             ;FUDGE UP START ADDRESS
42 16264 062076          DOB      0,DCU           ;GIVE START ADDR TO DCU
43 16265 020236          LDA      0,C2            ;START COMMAND
44 16266 061076 DCUWT:   DOA      0,DCU           ;START/CONT COMMANND
45 16267 063576          SKPBZ    DCU             ;WAIT TILL IT STOPS
46 16270 000777          JMP      .-1
47 16271 001400          JMP      0,3
48 16272 177700 CD.3:    -100
49 16273 000041 CD.2:    DCUIJ-1-.DCSTR
50                ;PROGRAM TO BE RUN IN DCU
51 16274 152400 DCUIJ:   SUB      2,2             ;CLEAR LOCAL MEM POINTER
52 16275 063077          HALT                     ;BACK TO HOST
53 16276 034633          LDA      3,DCUBF         ;GET BUFFER POINTER
54 16277 024773          LDA      1,CD.3          ;=-100
55
56 16300 021400 DCIL1:   LDA      0,0,3           ;GET WORD
57 16301 041000          STA      0,0,2           ;KEEP IN BOTTOM
58 16302 151400          INC      2,2
59 16303 175400          INC      3,3
60 16304 125404          INC      1,1,SZR         ;DONE THIS LOOP
```

```
 0175  PSID
01 16305 000773          JMP      DCIL1            ;NO
02 16306 063077          HALT                      ;YES
03 16307 000767          JMP      DCIL1-2          ;DO AGAIN
04
05               ;DCU CODE TO SET UP HOST CALLS AND THE RUN DIAG
06 16310 002132          JMP@     IDCRS
07 16311 016324          DCUIO
08 16312 020777 DCUGO:   LDA      0,.-1
09 16313 040233          STA      0,IOM?O          ;SET UP FAKE IO CALL IN LOCAL
10                                                 ;DCU MEMORY TO HANDLE IO
11 16314 020774          LDA      0,DCUGO-2        ;GET CONTROL R CALL
12 16315 040126          STA      0,RES?T          ;PUT IN LOCAL MEMORY
13 16316 102520          SUBZL    0,0
14 16317 040211          STA      0,ERR?4          ;NO DCU WAIT FOR TTI
15 16320 002401          JMP@     .+1
16 16321 000726          BEG4-1                    ;RUN THE TESTS
17               ;DCU IO MOD CALL
18 16322 000000 DXA0:    0
19 16323 000000 DXA3:    0                         ;THE HOST WILL MODIFY THIS LOC
20 16324 054777 DCUIO:   STA      3,.-1            ;DCU  GETS HERE ON IOMOD
21 16325 040775          STA      0,DXA0           ;KEEP AC0 FOR HOST
22 16326 063077          HALT                      ;WAIT FOR HOST
23 16327 020773          LDA      0,DXA0           ;GET AC0 FROM HOST
24 16330 002773          JMP@     DXA3             ;GO BACK TO CALL
25
26               ;HOST MONITOR, HOST SITS HERE WAITING FOR DCU CALLS
27 16331 063476 HMON:    SKPBN    DCU              ;IS DCU HALTED?
28 16332 000403          JMP      HDSER            ;YES,FIND OUT WHY
29 16333 000776          JMP      HMON             ;JUST CYCLE HERE
30
31 16334 006233 KCALL:   JSR@     IOM?O
32 16335 034766 HDSER:   LDA      3,DXA3
33 16336 035777          LDA      3,-1,3,          ;GET CALLING ROUTINE
34 16337 030775          LDA      2,KCALL
35 16340 156414          SUB#     2,3,SZR          ;CALL SHUD = JSR@ IOM?O
36 16341 000500          JMP      FDCUE            ;DCU ERROR
37 16342 036761          LDA@     3,DXA3           ;PICK UP DCU CALL
38 16343 010760          ISZ      DXA3             ;BUMP FOR LATER RETURN
39 16344 030233          LDA      2,IOM?O          ;SEE IF HOST IO MOD CALL NEEDED
40 16345 151024          MOVZ     2,2,SZR          ;SET CARRY IF THERE
41 16346 151040          MOVO     2,2
42 16347 030405          LDA      2,NIOPT          ;NO IOMOD PTR
43 16350 151002          MOV      2,2,SZC          ;SKIP IF NO IOMOD
44 16351 030411          LDA      2,YIOPT          ;IO MMOD POINTER
45 16352 173000          ADD      3,2              ;ADD CALL+1 OP CODE
46 16353 003000          JMP@     0,2              ;GO SERVICE
47
48 16354 016355 NIOPT:   .+1
49 16355 016431          HDIN
50 16356 016402          HDINO
51 16357 016407          HDTTO
52 16360 016417          HDLPT
53 16361 016445          HDCR                      ;CONTROL R FROM DCU
54 16362 016363 YIOPT:   .+1
55 16363 016435          YIOIN
56 16364 016372          YIOTH
57 16365 016372          YIOTH
58 16366 016372          YIOTH
59 16367 016445          HDCR                      ;CONTROL R FROM DCU
60 16370 006233 DCRES:   JSR@     IOM?O            ;DCU PRIVATE CALL FOR ^R
```

```
 0176  PSID
01 16371 000004          4
02                ;IOMODULE CALLS
03 16372 054403 YIOTH:   STA     3,.+3          ;SET UP CALL OPCODE
04 16373 020727          LDA     0,DXA0         ;CALL MIGHT NEED AC0
05 16374 006233          JSR@    IOM?0          ;CALL HOST IOMOD
06 16375 000000          0
07 16376 040724          STA     0,DXA0         ;PUT BACK FOR DCU
08
09 16377 176520 HEXIT:   SUBZL   3,3            ;DCU CONTINUE CMD
10 16400 075076          DOA     3,DCU          ;CONTINUE DCU
11 16401 000730          JMP     HMON           ;WAIT
12
13 16402 063610 HDIN0:   SKPDN   TTI
14 16403 000777          JMP     .-1            ;WAIT FOR INPUT
15 16404 060610          DIAC    0,TTI          ;GET CHAR CLEAR DONE
16 16405 040715          STA     0,DXA0         ;PUT WHERE DCU CAN GET
17 16406 000771          JMP     HEXIT
18
19 16407 020713 HDTTO:   LDA     0,DXA0         ;HOST OUTPUT FROM DCU
20 16410 063511          SKPBZ   TTO
21 16411 000777          JMP     .-1
22 16412 061111          DOAS    0,TTO          ;SEND CHAR
23 16413 063511          SKPBZ   TTO
24 16414 000777          JMP     .-1            ;WAIT FOR NO BUSY
25 16415 060211          NIOC    TTO            ;RESET DONE
26 16416 000761          JMP     HEXIT
27
28 16417 020703 HDLPT:   LDA     0,DXA0         ;DCU WORD
29 16420 063517          SKPBZ   LPT
30 16421 000777          JMP     .-1
31 16422 061117          DOAS    0,LPT          ;START LPT
32 16423 063517          SKPBZ   LPT
33 16424 000777          JMP     .-1
34 16425 063517          SKPBZ   LPT
35 16426 000775          JMP     .-3
36 16427 060217          NIOC    LPT
37 16430 000747          JMP     HEXIT
38
39 16431 063710 HDIN:    SKPDZ   TTI            ;KEY STRUCK?
40 16432 000752          JMP     HDIN0+2        ;YES GET IT
41 16433 010670          ISZ     DXA3           ;NO, BUMP RETURN
42 16434 000743          JMP     HEXIT
43
44 16435 006233 YIOIN:   JSR@    IOM?0
45 16436 000000          0
46 16437 000746          JMP     HDIN0+3
47 16440 000773          JMP     HDIN+2
48
49 16441 006215 FDCUE:   JSR@    IMES?
50 16442 016515          DCUEB                  ;FATAL DCU ERROR
51 16443 063077          HALT
52 16444 000777          JMP     .-1
53
54                ;CONTROL R STRUCK FROM DCU,WAIT FOR SWPACK KEY
55                ;ANOTHER CONTROL R WILL START
56 16445 020233 HDCR:    LDA     0,IOM?0        ;IOMODULE ROUTINE
57 16446 101004          MOV     0,0,SZR
58 16447 000405          JMP     .+5            ;USE IOMOD CALL
59 16450 063610          SKPDN   TTI            ;TTI IS USED
60 16451 000777          JMP     .-1
```

```
 0177  PSID
01 16452 006214          JSR@    IINP?           ;SW PACK ENTRY , KEY STRUCK
02 16453 000772          JMP     HDCR            ;ANOTHER KEY?
03 16454 006233          JSR@    IOM?O           ;CALL IOMODULE HANDLER
04 16455 000001          1
05 16456 000774          JMP     .-4
06                ;THE FOLLOWING ROUTINES REPLACE THE OCTAL AND DECIMAL
07                ;INPUT ROUTINES TO SEARCH FOR ^O,^R,OR ^D AND JUMP TO
08                ;THE APPROPRIATE PLACE IF ONE OF THESE CONTROL CHARS
09                ;IS STRUCK.
10
11
12                ;OCTAL INPUT ROUTINE
13 16457 000000          0
14 16460 054777 TTII:    STA     3,.-1
15 16461 050425          STA     2,TTS2          ;SAVE AC2
16 16462 006224          JSR@    ITI?O           ;GET CHARACTER
17 16463 004404          JSR     TTII1
18 16464 010773          ISZ     TTII-1
19 16465 030421 TTII2:   LDA     2,TTS2
20 16466 002771          JMP@    TTII-1          ;RETURN+2
21
22                ;ROUTINE LOOKS FOR ^O OR ^R, OR ^D
23 16467 030414 TTII1:   LDA     2,TTCO
24 16470 142415          SUB#    2,0,SNR         ;IS IT CONTROL O?
25 16471 006131          JSR@    IODT?           ;YES
26 16472 030412          LDA     2,TTCR          ;OR CONTROL R?
27 16473 142415          SUB#    2,0,SNR
28 16474 000126          JMP     RES?T           ;YES
29 16475 030410          LDA     2,TTCD          ;OR CONTROL D?
30 16476 142414          SUB#    2,0,SZR         ;
31 16477 001401          JMP     1,3             ;RETURN,WITHOUT MAIN RET BUMP
32 16500 102400          SUB     0,0             ;YES
33 16501 042213          STA@    0,ISWR?
34 16502 000126          JMP     RES?T
35
36
37 16503 000017 TTCO:    17
38 16504 000022 TTCR:    22
39 16505 000004 TTCD:    4
40 16506 000000 TTS2:    0
41
42
43                ;DECIMAL INPUT ROUTINE
44 16507 054750 TTID:    STA     3,TTII-1        ;DECIMAL INPUT ROUTINE
45 16510 050776          STA     2,TTS2          ;KEEP AC2
46 16511 006225          JSR@    ITI?D           ;GET DECIMAL
47 16512 004755          JSR     TTII1
48 16513 010744          ISZ     TTII-1          ;
49 16514 000751          JMP     TTII2
50
51 16515 005215 DCUEB:   .TXTE !<15><12> UNEXPLAINED DCU HALT !
52 16532 005215 BOUND:   .TXTE !<15><12>
53 16533 054724 TYPE FIRST LINE ADDRESS (IN DECIMAL)= !
54 16557 005215 MCODE:   .TXTE !<15><12>
55 16560 054724 TYPE 2 DIGIT DEVICE CODE SYNC CONTROLLER
56 16604 106640 <15><12>34 OR 44... !
57 16614 005015 TXTPS:   .TXT    !<15><12>...PASS !
58 16622 005215 LINES:   .TXTE   !<15><12>
59 16623 054724 TYPE OF SYNC BOARD?   1=PSI/1 2=PSI/2 0=PSI/U !
60 16653 005215 ULINES:  .TXTE   !<15><12>
```

```
 0178  PSID
01 16654 144714 LINE ADDRESS 8 OR 12? (IN DECIMAL) !
02 16676 005215 CLOCK:  .TXTE   !<15><12>
03 16677 054724 TYPE TRANSMIT CLOCK FREQUENCY IN HZ= !
04 16722 005215 MDCU:   .TXTE   !<15><12>
05 16723 054724 TYPE 2 DIGIT DEVICE CODE OF DCU !
06 16744 005215 CRCMSG:         .TXTE   !<15><12>
07 16745 054724 TYPE "1" IF CRC OPTION, "0" IF NOT !
08 16767 005215 INPDS:  .TXTE !<15><12> TYPE 1 IF NEW PARAMETERS
09 17005 142504 DESIRED  !
10 17013 005215 BCONL:  .TXTE !<15><12> TYPE 1 FOR BAUD CLOCK ONLY TEST   !
11 17036 005215 MDCDC:  .TXTE !<15><12>TYPE 2 DIGIT DEVICE CODE OF DCU   !
12 17061 005215 MDCUX:  .TXTE !<15><12>IS THERE A DCU IN THE SYSTEM?
13 17100 106477 <15><12>(1=YES,0=NO)  !
14 17111 005215 POBRT:  .TXTE !<15><12> ALLOWABLE RATES ARE 38400
15 17127 005215 <15><12>19200,9600,4800,2400,1200 AND 600 <15><12> !
16       000000         .NOLOC  0
17
18              ;CHANGE ALL DEVICE CODES FROM THE LOCATION IN CALL+2
19              ;UP TO BUT NOT THE LOCATION IN CALL+3, FROM THE OLD CODE
20              ;WHOSE ADDRESS IS IN CALL+1 TO WHAT IS IN AC0.
21              ;IGNORES CODE 77
22              ;EXIT TO CALL+4
23 17153 171400 DCHNG:  INC     3,2
24 17154 151400         INC     2,2
25 17155 050440         STA     2,DCH.5
26 17156 024440         LDA     1,DCH.1
27 17157 037376         LDA     3,@-2,2
28 17160 137400         AND     1,3
29 17161 057376         STA     3,@-2,2
30 17162 123400         AND     1,0
31 17163 040434         STA     0,DCH.6
32 17164 031377         LDA     2,-1,2
33 17165 136414         SUB#    1,3,SZR
34 17166 122415         SUB#    1,0,SNR
35 17167 000424         JMP     DCH.2
36 17170 021000 DCH.4:  LDA     0,0,2
37 17171 103112         ADDL#   0,0,SZC         ;IS IT AN I.O. INSTR?
38 17172 101103         MOVL    0,0,SNC
39 17173 103113         ADDL#   0,0,SNC
40 17174 000412         JMP     DCH.3           ;NO
41 17175 101200         MOVR    0,0
42 17176 162400         SUB     3,0
43 17177 123414         AND#    1,0,SZR
44 17200 000406         JMP     DCH.3           ;NOT OLD DEVICE CODE
45 17201 034416         LDA     3,DCH.6
46 17202 163000         ADD     3,0
47 17203 041000         STA     0,0,2
48 17204 034411         LDA     3,DCH.5
49 17205 037776         LDA     3,@-2,3
50 17206 151400 DCH.3:  INC     2,2
51 17207 022406         LDA     0,@DCH.5
52 17210 142414         SUB#    2,0,SZR
53 17211 000757         JMP     DCH.4
54 17212 034405         LDA     3,DCH.6
55 17213 030402 DCH.2:  LDA     2,DCH.5
56 17214 001001         JMP     1,2
57 17215 000000 DCH.5:  0
58 17216 000077 DCH.1:  77
59 17217 000000 DCH.6:  0
60              .MACRO  BDN1
```

```
 0179  PSID
01                      401
02              %
03              T?TY0
04              S?WPK
05
06              0?DTP
07                      0?DTD   2
08              D?IAG   401     BDN1
09              ;FIX UP IOMODULE
10 20776 000000 EGGS:   0                       ;AUTO RUN SWITCH
11 20777 000000         0                       ;DEVICE CODE
12 21000 000000         0                       ;CAT SWITCH
13 21001 000000         0                       ;# OF PASSES
14 21002 000000         0                       ;RETURN ADDRESS
15 21003 000000 SWREG:  0                       ;SWITCH REGISTER
16 21004 005215 DIRT:   .TXTE   !<15><12>...C.S.I.  PSI DIAG. REV. 02!
17       027056
18       141456
19       051456
20       144456
21       120056
22       050240
23       144523
24       042240
25       040711
26       027107
27       151240
28       053305
29       120056
30       131060
31       000000
32              .END

**00000 TOTAL ERRORS, 00000 FIRST PASS ERRORS
```

A000	000754		20/23	21/03#					
A001	000762		21/11#						
A002	000770		21/21#						
A003	001004		21/35#						
A004	001014		21/47#						
A005	001023		21/57#						
A006	001032		22/06#	146/45					
A007	001067		22/47#						
A008	001102		23/01#						
A008B	001106		23/05#	23/26					
A009	001132		23/29#						
A009A	001147		23/38	23/45#					
A010	001154		23/52#						
A011	001172		24/09#						
A012	001216		24/34#						
A013	001241		24/57#						
A014	001265		25/20#						
A015	001312		25/45#						
A016	001337		26/10#						
A017	001362		26/33#						
A017B	001414		26/35	27/06#					
A017C	001427		27/21#	27/26					
A017D	001437		27/22	27/32#					
A018	001444		26/38	27/04	27/38#				
A021	001470		28/02#						
A022	001505		28/18#						
A023	001521		28/34#	28/58					
A025	001551		29/01#						
A06A	001054		22/33#						
AC0?	020572		179/09#						
AC1?	020573		179/09#						
AC2?	020574		179/09#						
AC3?	000207		14/52#	179/09					
ADROU	030477	MC	9/12#	31/13	37/20	37/50	38/21	38/60	39/26
			82/58	99/45	103/46	114/12	114/40	115/08	115/41
			116/09	116/37	117/05	117/39	118/07	118/37	129/12
			131/22	132/31	133/49	134/39	135/45	137/59	138/15
			138/31	147/31	152/38				
AMASK	000060		13/28#	27/52	28/12	29/13			
BCONL	017013		17/27	178/10#					
BDADR	000075		13/43#	17/36	18/38	20/01	20/02	27/54	28/47
			29/15	151/37	157/23				
BDN1	031222	MC	178/60#	179/09					
BEG1	000466		14/46	17/13#					
BEG10	000660		19/21#	19/24	19/28				
BEG11	000717		17/11	19/38	19/53#				
BEG1A	000503		17/18	17/26#					
BEG1B	000514		17/29	17/35#					
BEG2	000516		17/38#	17/42	17/45	17/48			
BEG3	000600		18/15	18/30#	18/33	18/36			
BEG3A	000607		18/29	18/37#					
BEG3B	000611		18/40#	18/43	18/45				
BEG4	000727		20/02#	175/16					
BEG5	000737		20/10#	172/11					
BEG6	000546		18/04#	18/07	18/12				
BEG6A	000562		18/09	18/16#	18/22	18/28			
BEG6B	000577		18/25	18/29#					
BEG7	000621		18/49#	19/14					
BEG8	000652		19/10	19/15#	19/18				

BEG9	000715		19/20	19/51#					
BEGW	000647		18/52	18/57	19/03	19/12#			
BE.X1	000703		18/53	18/54	19/40#				
BGN?A	000202		14/44	14/46#					
BITCH	030766	MC	10/51#	39/59	40/34	41/06	41/37	42/09	42/40
			43/12						
BOUND	016532		18/31	177/52#					
C0	000234		15/16#	90/60	95/56	97/46	98/23		
C1	000235		15/17#	36/16	36/45	36/48	36/51	38/03	38/06
			38/09	38/33	38/36	38/39	39/39	39/42	39/45
			40/07	40/10	40/13	40/42	40/45	40/48	41/14
			41/17	41/20	41/45	41/48	41/51	42/17	42/20
			42/23	42/48	42/51	42/54	43/20	43/23	43/26
			43/52	43/55	43/58	44/07	44/32	44/35	44/38
			44/47	45/31	45/34	45/37	46/03	46/06	46/09
			46/38	46/41	46/44	47/14	47/17	47/20	47/49
			47/52	47/55	48/25	48/28	48/31	48/60	49/03
			49/06	49/36	49/39	49/42	50/12	50/15	50/20
			50/43	50/46	50/51	51/16	51/19	51/24	51/50
			51/53	51/58	52/23	52/26	52/31	52/57	52/60
			53/05	53/30	53/33	53/38	54/04	54/07	54/12
			54/42	54/45	54/50	55/12	55/15	55/20	55/45
			55/48	55/53	56/19	56/22	56/27	56/52	56/55
			56/60	57/25	57/28	57/33	57/58	58/01	58/06
			58/31	58/34	58/39	59/04	59/07	59/12	59/21
			59/45	59/48	59/53	60/02	60/28	60/31	60/36
			60/47	61/15	61/18	61/23	61/32	61/55	61/58
			62/03	62/25	62/28	62/33	62/58	63/01	63/06
			63/32	63/35	63/40	64/05	64/08	64/13	64/39
			64/42	64/47	65/12	65/15	65/20	65/46	65/49
			65/54	66/22	66/25	66/30	66/52	66/55	66/60
			67/25	67/28	67/33	67/59	68/02	68/07	68/33
			68/36	68/41	69/07	69/10	69/15	69/41	69/44
			69/49	70/14	70/17	70/22	70/50	70/53	70/58
			71/07	71/32	71/35	71/40	71/49	72/15	72/18
			72/23	72/32	72/44	73/07	73/10	73/15	73/24
			73/36	74/02	74/05	74/10	74/19	74/31	74/43
			75/07	75/10	75/15	75/24	75/36	75/48	76/14
			76/17	76/22	76/31	76/45	77/09	77/12	77/17
			77/26	77/40	78/06	78/09	78/14	78/23	78/37
			78/49	79/12	79/15	79/20	79/29	79/43	79/55
			80/21	80/24	80/29	80/38	80/52	81/04	81/16
			81/39	81/42	81/47	81/56	82/10	82/22	82/34
			83/14	83/17	83/22	83/31	83/57	83/60	84/05
			84/14	85/10	85/35	85/43	85/48	85/54	86/13
			86/21	86/26	86/53	87/01	87/06	87/30	87/38
			87/43	88/07	88/15	88/20	88/44	88/52	88/57
			89/21	89/29	89/34	89/58	90/06	90/11	90/37
			90/45	90/50	90/56	91/14	91/22	91/27	91/51
			91/59	92/04	92/28	92/36	92/41	93/05	93/13
			93/18	93/42	93/50	93/55	94/19	94/27	94/32
			94/56	95/04	95/09	95/33	95/41	95/46	95/52
			96/10	96/18	96/23	96/47	96/55	96/60	97/23
			97/31	97/36	97/42	97/60	98/08	98/13	98/37
			98/45	98/50	99/14	99/22	99/27	100/35	100/43
			100/48	100/60	101/08	101/25	101/33	101/40	101/52
			102/04	102/16	102/35	102/43	102/50	103/02	103/14
			103/26	103/58	104/06	104/13	104/25	104/37	104/59

		105/07	105/12	105/24	105/36	105/48	106/09	106/17
		106/24	106/36	106/48	106/60	107/12	107/32	107/35
		107/40	107/52	109/49	109/57	110/02	110/15	110/35
		110/43	110/48	110/60	111/19	111/27	111/32	111/46
		112/06	112/14	112/19	112/31	127/14	127/22	127/27
		127/39	127/51	128/15	128/23	128/28	128/40	128/52
		131/37	131/45	131/52	132/04	132/16	132/40	132/48
		132/55	133/07	133/19	133/56	134/04	134/09	134/21
		135/37	148/02	148/14	148/28	149/05	149/19	149/51
		149/58	150/03	150/17	150/49	150/54	151/08	153/14
		153/20	153/25	153/39	154/17	154/28	154/33	154/50
		155/29	155/40	155/45	156/02	156/27	172/18	172/26
		172/32	172/45					
C10	000255	15/33#	159/24	160/23	162/09	163/28	164/54	166/11
C100	000277	15/51#	86/36	92/14	96/33	174/11		
C1000	000340	16/24#	111/39					
C100K	000341	16/25#	157/21	159/31	160/31	162/07	163/21	164/48
		166/05	166/56	167/35	168/33	169/17	170/05	170/46
		171/20						
C101K	000342	16/26#	157/25	162/36	164/11	165/26	166/44	167/16
		168/05	168/15	168/58	169/43	170/32	171/12	171/47
C10.	000246	15/26#	42/29	48/37	53/11	57/39	64/53	69/21
C10?0	017657	179/04#	179/05					
C11	000256	15/34#	26/57	110/09	110/55	145/23		
C11.	000247	15/27#	84/11	89/03	94/01			
C12	000257	15/35#	104/32					
C120	000300	15/52#	87/53	93/28				
C124	000301	15/53#	89/07	94/42				
C125	000302	15/54#	36/35	45/18	45/55	46/30	47/06	47/41
		48/17	48/52	49/28	54/47	55/17	55/50	56/24
		56/57	57/30	58/03	58/36	59/09	60/33	60/44
		61/20	83/19	85/45	86/23	87/03	87/40	88/17
		88/54	89/31	90/08	90/21	100/23	100/55	103/35
		107/07	127/34	127/46	128/35	128/47	130/58	131/11
		161/26						
C127	000303	15/55#	122/51					
C12.	000250	15/28#	18/26	42/60	49/12	53/44	58/12	65/26
		69/55						
C13	000260	15/36#	137/25					
C13.	000251	15/29#	44/04	44/44	59/18	59/59	60/42	61/29
		71/04	71/46	72/29	72/41	73/21	73/33	74/16
		74/28	74/40	75/21	75/33	75/45	76/28	76/40
		77/23	77/35	78/20	78/32	78/46	79/26	79/38
		79/52	80/35	80/47	81/01	81/13	81/53	82/05
		82/19	82/31	89/40	94/38			
C140	000304	15/56#	97/10					
C1400	000343	16/27#	113/48					
C1401	000344	16/28#	36/37	50/06	61/09			
C1402	000345	16/29#	45/16	45/23	54/34	66/16		
C14.	000252	15/30#	43/32	49/48	54/18	58/45	65/60	70/28
C14.1	000346	16/30#	138/18					
C15.	000253	15/31#	90/17	95/15				
C167	000305	15/57#	119/15	120/34				
C16.	000254	15/32#						
C17	000261	15/37#						
C177	000306	15/58#	119/36	120/52	132/11			
C1B?6	020730	179/09#						
C1.41	012467	132/37	133/34#					

C2	000236	15/18#	20/17	40/19	44/56	46/15	50/57	55/26
		60/11	62/39	67/06	71/58	73/45	75/57	77/49
		80/04	82/43	98/19	102/11	103/21	128/01	129/02
		130/35	174/30	174/43				
C20	000262	15/38#	23/04	143/40				
C200	000307	15/59#	85/58	91/37	127/02			
C2012	000330	16/16#	76/42	77/37				
C2025	000331	16/17#	78/34	79/40	80/49	82/07		
C21	000263	15/39#	143/15					
C213	000310	15/60#	133/28					
C237	000311	16/01#	104/20					
C240	000312	16/02#	87/16	92/51				
C25	000264	15/40#	141/32					
C250	000313	16/03#	88/30	94/05	101/59	103/09		
C252	000314	16/04#	45/25	50/17	50/48	51/21	51/55	52/28
		53/02	53/35	54/09	59/50	84/02	89/44	90/47
		91/24	92/01	92/38	93/15	93/52	94/29	95/06
		95/19	153/34	154/42	155/54	156/52		
C26	000265	15/41#	131/47	131/59	132/50	133/02		
C260	000315	16/05#	101/47	102/57				
C267	000316	16/06#	101/35	102/45				
C27	000266	15/42#	104/08	121/51				
C270	000317	16/07#	105/19	105/31	105/43	106/19	106/31	106/43
		106/55	112/40	112/59	113/19			
C277	000320	16/08#						
C3	000237	15/19#	18/10	44/10	44/50	59/24	60/05	60/50
		61/35	71/10	71/52	72/35	72/47	73/27	73/39
		74/22	74/34	74/46	75/27	75/39	75/51	76/34
		76/48	77/29	77/43	78/26	78/40	78/52	79/32
		79/46	79/58	80/41	80/55	81/07	81/19	81/59
		82/13	82/25	82/37	83/34	84/17	86/32	91/33
		96/29	137/22					
C30	000267	15/43#	108/57					
C3012	000332	16/18#	66/27	66/57	67/30	68/04	68/38	69/12
		69/46	70/19	72/20	73/12	76/19	77/14	
C3025	000333	16/19#	61/60	62/30	63/03	63/37	64/10	64/44
		65/17	65/51	70/55	71/37	74/07	75/12	78/11
		79/17	80/26	81/44				
C357	000321	16/09#						
C36	000270	15/44#						
C367	000322	16/10#	119/55					
C37	000271	15/45#	122/11					
C373	000323	16/11#						
C375	000324	16/12#						
C376	000325	16/13#						
C377	000326	16/14#	39/11	95/43	96/20	96/57	97/33	98/10
		98/47	99/24	109/36	112/26	114/31	114/59	115/27
		115/60	116/28	116/56	117/24	117/58	118/26	118/56
		148/23	149/14	150/12	151/03	170/57	171/31	
C3.01	012470	133/14	133/35#					
C4	000240	15/20#	35/58	36/19	40/54	46/50	51/30	55/59
		63/12	67/39	123/13	123/34	123/55	124/15	124/36
		124/56	125/16	125/39	125/60	126/20	126/41	134/43
		134/59	135/21	135/49	136/05	136/28	137/18	137/40
		137/49	138/05	138/21	138/37	138/59	139/21	139/46
		140/09	140/45	141/04	141/25	141/47	142/11	142/50
		143/11	143/36	143/60	144/24	144/57	145/19	145/44
		146/08	146/58	147/18	151/34	151/59	152/26	161/24

		102/08	102/20	102/44	102/54	103/06	103/18	103/30
		104/07	104/17	104/29	104/41	105/08	105/16	105/28
		105/40	105/52	106/18	106/28	106/40	106/52	107/04
		107/16	107/36	107/44	107/56	108/14	108/31	109/58
		110/06	110/19	110/44	110/52	111/04	111/28	111/36
		111/50	112/15	112/23	112/35	127/23	127/31	127/43
		127/55	128/24	128/32	128/44	128/56	131/46	131/56
		132/08	132/20	132/49	132/59	133/11	133/23	134/05
		134/13	134/25	134/44	134/60	135/22	135/38	135/50
		136/06	136/29	137/19	137/41	137/50	138/06	138/22
		138/38	138/60	139/22	139/47	140/10	140/46	141/05
		141/26	141/48	142/12	142/51	143/12	143/37	144/01
		144/25	144/58	145/20	145/45	146/09	146/59	147/19
		148/10	148/18	148/32	149/01	149/09	149/23	149/59
		150/07	150/21	150/50	150/58	151/12	151/35	151/60
		152/27	153/21	153/29	153/43	154/29	154/37	154/54
		155/41	155/49	156/06	156/28	172/27	172/36	172/49
ICRL?	000216	14/60#	179/05	179/08	179/09			
ICYC?	000227	15/09#	21/44	27/30	169/47	179/09		
ICY?C	000231	15/11#	15/15					
IDCHN	000122	14/06#	17/50	17/57	19/30			
IDCRS	000132	14/14#	175/06					
IEGG?	000212	14/56#	179/09					
IENT?	000226	15/08#	21/03	21/11	21/22	21/35	21/47	21/57
		22/06	22/33	22/47	23/01	23/29	23/52	24/09
		24/34	24/57	25/20	25/45	26/10	26/39	27/06
		27/38	28/02	28/18	28/34	29/01	30/03	30/18
		30/34	30/53	31/10	31/25	31/40	31/55	32/09
		32/26	32/39	32/59	33/21	33/46	34/12	34/37
		35/01	35/27	35/51	36/09	36/30	37/17	37/47
		38/18	38/57	39/23	39/60	40/35	41/07	41/38
		42/10	42/41	43/13	43/45	44/25	45/06	45/52
		46/27	47/03	47/38	48/14	48/49	49/25	49/59
		50/36	51/09	51/43	52/16	52/50	53/23	53/57
		54/29	55/05	55/38	56/12	56/45	57/18	57/51
		58/24	58/56	59/38	60/21	61/04	61/48	62/18
		62/51	63/25	63/58	64/32	65/05	65/39	66/11
		66/45	67/18	67/52	68/26	68/60	69/34	70/07
		70/39	71/25	72/08	72/60	73/55	74/60	76/07
		77/02	77/59	79/05	80/14	81/32	82/55	83/49
		85/03	85/28	86/06	86/46	87/23	87/60	88/37
		89/14	89/51	90/30	91/07	91/44	92/21	92/58
		93/35	94/12	94/49	95/26	96/03	96/40	97/16
		97/53	98/30	99/07	99/42	100/10	100/28	101/16
		102/28	103/43	104/50	105/60	107/24	108/05	108/23
		108/41	109/04	109/23	109/41	110/28	111/12	111/59
		112/45	113/05	113/24	113/43	114/09	114/37	115/05
		115/38	116/06	116/34	117/02	117/36	118/04	118/34
		119/01	119/22	119/42	120/01	120/21	120/39	120/58
		121/18	121/37	121/57	122/18	122/37	122/58	123/19
		123/40	123/60	124/21	124/41	125/02	125/24	125/45
		126/05	126/26	126/46	127/07	128/07	129/09	129/40
		130/08	130/40	131/19	132/28	133/37	134/36	134/50
		135/06	135/28	135/56	136/13	137/03	137/31	137/56
		138/12	138/28	138/44	139/06	139/31	139/60	140/28
		140/55	141/10	141/38	142/02	142/35	142/56	143/21
		143/45	144/15	144/42	145/04	145/29	145/59	146/47
		147/05	147/28	147/39	148/43	149/31	150/31	151/22

	151/43	152/07	152/35	152/46	153/52	155/03	156/18
	156/36	157/29	157/45	158/01	158/19	158/34	158/50
	159/19	160/18	160/50	161/19	161/60	162/46	164/17
	165/33	166/50	167/24	168/22	169/06	169/54	170/41
	171/15						
IERR? 000230	15/10#	21/08	21/16	21/31	21/41	21/53	22/03
	22/25	22/44	22/58	23/23	23/42	23/49	24/07
	24/30	24/53	25/17	25/41	26/07	26/30	27/01
	27/28	27/36	27/58	28/15	28/31	28/55	29/19
	30/15	30/31	30/47	31/07	31/22	31/36	31/52
	32/06	32/24	32/36	32/52	33/13	33/43	34/08
	34/34	34/59	35/23	35/49	36/06	36/27	37/03
	37/39	38/54	39/19	39/57	40/27	41/02	41/34
	42/05	42/37	43/08	43/40	44/21	45/04	45/48
	46/23	46/58	47/34	48/09	48/45	49/20	49/56
	50/31	51/05	51/38	52/12	52/45	53/19	53/52
	54/26	55/01	55/34	56/07	56/41	57/14	57/47
	58/20	58/53	59/35	60/19	61/01	61/46	62/14
	62/47	63/20	63/54	64/27	65/01	65/34	66/08
	66/41	67/14	67/47	68/21	68/55	69/29	70/03
	70/36	71/21	72/06	72/58	73/53	74/57	76/05
	76/59	77/57	79/03	80/12	81/30	82/51	83/45
	84/28	85/21	86/01	86/39	87/19	87/56	88/33
	89/10	89/47	90/24	91/03	91/40	92/17	92/54
	93/31	94/08	94/45	95/22	95/59	96/36	97/13
	97/49	98/26	99/03	99/40	100/04	100/26	101/13
	102/26	103/38	104/47	105/58	107/22	108/02	108/21
	108/38	109/01	109/20	109/39	110/25	111/10	111/56
	112/43	113/02	113/22	113/40	114/04	114/34	115/02
	115/30	116/03	116/31	116/59	117/27	118/01	118/29
	118/59	119/18	119/39	119/58	120/18	120/37	120/55
	121/15	121/34	121/54	122/14	122/34	122/54	123/16
	123/37	123/58	124/18	124/39	124/59	125/19	125/42
	126/03	126/23	126/44	127/05	128/04	129/05	129/37
	130/06	130/38	131/15	132/26	133/31	134/32	134/47
	135/03	135/25	135/53	136/11	136/34	137/28	137/54
	138/09	138/25	138/41	139/04	139/28	139/58	140/25
	140/52	141/08	141/35	141/60	142/27	142/54	143/18
	143/43	144/12	144/40	145/01	145/26	145/56	146/24
	147/02	147/22	148/39	149/29	150/28	151/18	151/40
	152/04	152/32	153/50	155/01	156/16	156/33	157/12
	157/38	157/55	158/11	158/29	158/43	159/05	159/40
	159/57	160/04	160/37	161/06	161/36	161/46	162/22
	163/49	165/11	166/29	167/06	167/54	168/47	169/31
	170/18	170/60	171/34				
IINP? 000214	14/58#	177/01	179/09				
IINR? 020200	179/08#						
IMES? 000215	14/59#	17/14	17/19	17/26	17/38	18/04	18/19
	18/30	18/40	18/49	19/12	19/15	19/21	172/07
	176/49	179/08	179/09				
IN0? 017747	179/05#						
IN1? 020034	179/05#						
IN1?0 017730	179/05#						
IN1?2 020151	179/05#	179/08					
IN1?3 017727	179/05#						
IN1?5 020152	179/05#	179/08					
IN2? 020041	179/05#						
IN3? 017716	179/05#						

IN3?3	017726	179/05#						
IN4?	020102	179/05#						
IN5?	017766	179/05#						
IN6?	020002	179/05#						
IN6?0	020150	179/05#	179/08					
INB?A	020144	179/05#	179/08					
INB?I	020145	179/05#	179/08					
INL?K	017732	179/05#						
INM?	020056	179/05#						
INPDS	016767	17/20	178/08#					
INP?1	017734	179/05#						
INP?I	017737	179/05#						
INP?J	017742	179/05#						
INP?K	020372	14/58	179/08#					
INP?Q	020134	179/05#	179/08					
INP?R	020142	179/05#	179/08					
INR?	020004	179/05#	179/08					
INR?1	020403	179/08#						
INR?K	020402	179/08#						
INR?O	020404	179/08#						
INS?	020146	179/05#						
INS?0	020136	179/05#						
INS?1	020137	179/05#						
INS?2	020140	179/05#						
INS?3	020141	179/05#	179/08					
INS?A	020135	179/05#	179/08					
INS?V	020116	179/05#	179/08					
INS?X	020177	179/08#						
INT?	017622	179/04#	179/05					
INT?E	017731	179/05#						
IN?PR	017733	179/05#						
IODT?	000131	14/13#	177/25	179/08				
IOM?O	000233	15/14#	26/36	175/09	175/31	175/39	175/60	176/05
		176/44	176/56	177/03	179/04	179/05	179/09	
IPDC?	000221	15/03#	179/05	179/08	179/09			
IPDE?	000220	15/02#						
IPOC?	000222	15/04#	179/08	179/09				
ISWR?	000213	14/57#	177/33	179/04	179/05	179/09		
ITI?D	000225	15/07#	177/46					
ITI?O	000224	15/06#	177/16					
ITPS?	000232	15/12#	179/05	179/08				
ITR01	000130	14/12#	32/57					
ITRMT	000155	14/36#	35/55	36/13	36/42	37/29	37/60	39/09
		39/36	40/04	40/39	41/11	41/42	42/14	42/45
		43/17	43/49	44/29	45/28	45/60	46/35	47/11
		47/46	48/22	48/57	49/33	50/09	50/40	51/13
		51/47	52/20	52/54	53/27	54/01	54/39	55/09
		55/42	56/16	56/49	57/22	57/55	58/28	59/01
		59/42	60/25	61/12	61/52	62/22	62/55	63/29
		64/02	64/36	65/09	65/43	66/19	66/49	67/22
		67/56	68/30	69/04	69/38	70/11	70/47	71/29
		72/12	73/04	73/59	75/04	76/11	77/06	78/03
		79/09	80/18	81/36	83/11	83/54	85/07	85/32
		86/10	86/50	87/27	88/04	88/41	89/18	89/55
		90/34	91/11	91/48	92/25	93/02	93/39	94/16
		94/53	95/30	96/07	96/44	97/20	97/57	98/34
		99/11	99/54	100/14	100/32	101/22	102/32	103/55
		104/56	106/06	107/29	108/10	108/27	108/47	109/08

			30/48	31/08	31/23	31/37	31/53	32/07	32/25
			32/37	32/53	33/14	33/44	34/09	34/35	34/60
			35/24	35/50	36/07	36/28	37/04	37/40	38/55
			39/20	39/58	40/28	41/03	41/35	42/06	42/38
			43/09	43/41	44/22	45/05	45/49	46/24	46/59
			47/35	48/10	48/46	49/21	49/57	50/32	51/06
			51/39	52/13	52/46	53/20	53/53	54/27	55/02
			55/35	56/08	56/42	57/15	57/48	58/21	58/54
			59/36	60/20	61/02	61/47	62/15	62/48	63/21
			63/55	64/28	65/02	65/35	66/09	66/42	67/15
			67/48	68/22	68/56	69/30	70/04	70/37	71/22
			72/07	72/59	73/54	74/58	76/06	76/60	77/58
			79/04	80/13	81/31	82/52	83/46	84/29	85/22
			86/02	86/40	87/20	87/57	88/34	89/11	89/48
			90/25	91/04	91/41	92/18	92/55	93/32	94/09
			94/46	95/23	95/60	96/37	97/14	97/50	98/27
			99/04	99/41	100/05	100/27	101/14	102/27	103/39
			104/48	105/59	107/23	108/03	108/22	108/39	109/02
			109/21	109/40	110/26	111/11	111/57	112/44	113/03
			113/23	113/41	114/05	114/35	115/03	115/31	116/04
			116/32	116/60	117/28	118/02	118/30	118/60	119/19
			119/40	119/59	120/19	120/38	120/56	121/16	121/35
			121/55	122/15	122/35	122/55	123/17	123/38	123/59
			124/19	124/40	124/60	125/20	125/43	126/04	126/24
			126/45	127/06	128/05	129/06	129/38	130/07	130/39
			131/18	132/27	133/32	134/33	134/48	135/04	135/26
			135/54	136/12	137/01	137/29	137/55	138/10	138/26
			138/42	139/05	139/29	139/59	140/26	140/53	141/09
			141/36	142/01	142/28	142/55	143/19	143/44	144/13
			144/41	145/02	145/27	145/57	146/25	147/03	147/23
			148/40	149/30	150/29	151/19	151/41	152/05	152/33
			153/51	155/02	156/17	156/34	157/13	157/42	157/59
			158/17	158/32	158/48	159/14	160/10	160/48	161/14
			161/55	162/39	164/13	165/28	166/46	167/19	168/08
			169/01	170/34	171/14	171/49			
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LOO?T	020751		179/09#						
LOP?E	020564		179/09#						
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M000	012547		134/36#						
M002	012561		134/50#						
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M006	012733		137/31#						
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M008	012773		138/12#						
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M012	013071		139/31#						
M013	013121		139/60#						
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M015	013210		141/10#						
M016	013237		141/38#						
M017	013263		142/02#						
M018	013317		142/35#						
M019	013340		142/56#						

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	75/35	75/41	75/47	75/53	76/16	76/24	76/30
	76/36	76/44	76/50	77/11	77/19	77/25	77/31
	77/39	77/45	78/08	78/16	78/22	78/28	78/36
	78/42	78/48	78/54	79/14	79/22	79/28	79/34
	79/42	79/48	79/54	79/60	80/23	80/31	80/37
	80/43	80/51	80/57	81/03	81/09	81/15	81/21
	81/41	81/49	81/55	82/01	82/09	82/15	82/21
	82/27	82/33	82/39	83/16	83/24	83/30	83/36
	83/59	84/07	84/13	84/19	85/42	85/50	86/20
	86/28	86/60	87/08	87/37	87/45	88/14	88/22
	88/51	88/59	89/28	89/36	90/05	90/13	90/44
	90/52	91/21	91/29	91/58	92/06	92/35	92/43
	93/12	93/20	93/49	93/57	94/26	94/34	95/03
	95/11	95/40	95/48	96/17	96/25	96/54	97/02
	97/30	97/38	98/07	98/15	98/44	98/52	99/21
	99/29	100/42	100/50	101/02	101/32	101/42	101/54
	102/06	102/18	102/42	102/52	103/04	103/16	103/28
	104/05	104/15	104/27	104/39	105/06	105/14	105/26
	105/38	105/50	106/16	106/26	106/38	106/50	107/02
	107/14	107/34	107/42	107/54	108/12	108/29	109/56
	110/04	110/17	110/42	110/50	111/02	111/26	111/34
	111/48	112/13	112/21	112/33	127/21	127/29	127/41
	127/53	128/22	128/30	128/42	128/54	131/44	131/54
	132/06	132/18	132/47	132/57	133/09	133/21	134/03
	134/11	134/23	134/42	134/58	135/20	135/36	135/48
	136/04	136/27	137/17	137/39	137/48	138/04	138/20
	138/36	138/58	139/20	139/45	140/08	140/44	141/03
	141/24	141/46	142/10	142/49	143/10	143/35	143/59
	144/23	144/56	145/18	145/43	146/07	146/57	147/17
	148/08	148/16	148/30	148/59	149/07	149/21	149/57
	150/05	150/19	150/48	150/56	151/10	151/33	151/58
	152/25	153/19	153/27	153/41	154/27	154/35	154/52
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NIOPT 016354	175/42	175/48#					
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NOLOO 000000	13/17#	147/45	147/50	148/54	149/38	149/45	150/42
NOPAR 000000	13/19#	35/56	36/14	36/43	37/30	38/01	39/10
	39/37	40/05	40/40	41/12	41/43	42/15	42/46
	43/18	43/50	44/30	45/29	46/01	46/36	47/12
	47/47	48/23	48/58	49/34	50/10	50/41	51/14
	51/48	52/21	52/55	53/28	54/02	54/40	55/10
	55/43	56/17	56/50	57/23	57/56	58/29	59/02
	59/43	60/26	61/13	61/53	62/23	62/56	63/30
	64/03	64/37	65/10	65/44	66/20	66/50	67/23
	67/57	68/31	69/05	69/39	70/12	70/48	71/30
	72/13	73/05	73/60	75/05	76/12	77/07	78/04
	79/10	80/19	81/37	83/12	83/55	85/08	85/33
	86/11	86/51	87/28	88/05	88/42	89/19	89/56
	90/35	91/12	91/49	92/26	93/03	93/40	94/17
	94/54	95/31	96/08	96/45	97/21	97/58	98/35
	99/12	99/55	100/15	100/33	101/23	102/33	103/56
	104/57	106/07	107/30	108/11	108/28	108/48	109/09
	109/28	109/47	110/33	111/17	112/04	112/51	113/11
	113/31	113/55	114/23	114/51	115/19	115/52	116/20
	116/48	117/16	117/50	118/18	127/12	128/13	129/22
	129/45	130/13	130/47	133/54	147/45	147/50	148/54
	149/38	149/45	150/42	153/12	154/09	154/15	155/21

			155/27	156/42					
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OD1?2	020151		179/08#						
OD1?5	020152		179/08#						
OD6?0	020150		179/08#						
OD7?	020356		179/08#						
ODA?	020155		179/08#						
ODA?C	020153		179/08#						
ODA?L	020300		179/08#						
ODB?E	020341		179/08#						
ODB?P	020220		179/08#						
ODDPA	000002		13/20#	119/27	119/47	120/44	121/03	122/02	122/23
			122/43	123/24	124/05	124/46	125/08		
ODD?B	020215		179/08#						
ODD?R	020322		179/08#						
ODD?T	020362		179/08#						
ODE?1	020345		179/08#						
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ODE?4	020354		179/08#						
ODE?Q	020360		179/08#						
ODI?N	020365		179/08#						
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ODL?C	020266		179/08#						
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ODO?C	020306		179/08#						
ODO?F	020363		179/08#						
ODO?K	000210		14/53#	179/08					
ODP?C	020164		179/08#						
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ODT?1	020211		179/08#						
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ODT?3	020370		179/08#						
ODT?I	020201		179/08#						
ODT?J	020204		14/13	179/08#					
ODT?K	020405		179/08#						
ODT?P	020367		179/08#						
ODU?A	020361		179/08#						
ODW?T	020237		179/08#						
OFF	000067		13/35#	22/12	135/12	135/42	136/19	137/09	137/45
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			144/31	144/48	145/10	145/35	145/51	146/15	148/50
			150/36	155/09	155/13	171/55			
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			155/36	157/19	168/17	171/57			
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			150/38	151/01	151/54	152/22	153/07	153/32	154/10
			154/40	155/22	155/52				
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O?DTP	022740	MC	179/06						
P17?7	017553		179/04#	179/05					
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PA?SI  000204        14/48#
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PC1?2  017653       179/04# 179/05
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PC4?0  017524       179/04#
PC6?0  017373       179/04#
PC7?   017525       179/04#
PCR?Y  017367       179/04#
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PDC?S  017312        15/03  179/04#
PDE?C  017322        15/02  179/04#
PLP?T  017452       179/04#
POBRT  017111        19/13  178/14#
POC?T  017304        15/04  179/04#
PSP?   017237       179/04#
P?GOU  024652  MC    14/40
R001   006234        85/03#
R002   006254        85/27#
R003   006307        86/05#
R004   006342        86/45#
R005   006375        87/22#
R006   006430        87/59#
R007   006463        88/36#
R008   006516        89/13#
R009   006551        89/50#
R010   006604        90/29#
R011   006637        91/06#
R012   006672        91/43#
R013   006725        92/20#
R014   006760        92/57#
R015   007013        93/34#
R016   007046        94/11#
R017   007101        94/48#
R018   007134        95/25#
R019   007167        96/02#
R020   007222        96/39#
R021   007255        97/15#
R022   007310        97/52#
R023   007343        98/29#
R024   007376        99/06#
R025   007431        99/42#
R026   007455       100/10#
R027   007474       100/28#
R028   007537       101/16#
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R030   007715       103/40  103/42#
R031   010000       104/50#
R032   010063       105/60#
RB6?0  017715       179/04#
RBYT   000074        13/40# 158/54  159/26  163/23  166/07  167/36  168/34
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0200 PSID

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SY052	011107		117/34#	118/40						
SY100	011105		117/32#	117/42						
SY200	011106		117/33#	118/10						
SY252	002347		37/45#	39/29						
SY270	007714		103/41#	103/49						
SY377	002346		37/44#	38/24	39/03					
SYNC	031161	MC	12/03#	37/16	37/46	38/17	38/56	39/22	82/54	
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			117/01	117/35	118/03	118/33	129/08	147/27	152/34	
SZ200	013636		146/46#	147/34	147/51					
S?WPD	000050	MC	2/34	179/05						
S?WPK	021330	MC	179/04							
T000	001573		30/03#							
T001	001607		30/18#							
T003	001624		30/34#							
T004	001641		30/53#							
T005	001657		31/10#							
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T007	001707		31/40#							
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T010	001757		32/26#							
T011	001772		32/39#							
T012	010161		107/24#							
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T013A	010234		108/23#							
T014	010252		108/41#							
T015	010273		109/04#							
T016	010312		109/23#							
T017	010331		109/41#							
T018	010373		110/28#							
T019	010434		111/12#							
T020	010477		111/59#							
T021	010542		112/45#							
T022	010561		113/05#							
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T024	010617		113/43#							
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T035	010671		114/36#							
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T037	010752		115/32	115/37#						
T038	011000		116/05#							
T039	011026		116/33#							
T040	011054		117/01#							
T041	011110		117/29	117/35#						
T042	011136		118/03#							
T046	011164		118/33#							
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T049	011250		119/42#							
T050	011267		120/01#							
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TIN?O	017562	15/06	179/04#
TIN?Q	017571	179/04#	
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TR02	002241	36/09#	
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TR3F	002436	38/56#	

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			113/27	130/43	131/05	146/36	148/21	149/12	152/18
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			86/09	86/49	87/26	88/03	88/40	89/17	89/54
			90/33	91/10	91/47	92/24	93/01	93/38	94/15
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			72/22	72/28	72/34	72/40	72/46	73/06	73/14
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			74/15	74/21	74/27	74/33	74/39	74/45	75/06
			75/14	75/20	75/26	75/32	75/38	75/44	75/50
			75/56	76/13	76/21	76/27	76/33	76/39	76/47
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			78/05	78/13	78/19	78/25	78/31	78/39	78/45
			78/51	79/11	79/19	79/25	79/31	79/37	79/45
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			80/46	80/54	80/60	81/06	81/12	81/18	81/38
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			85/53	86/12	86/25	86/31	86/52	87/05	87/11
			87/29	87/42	87/48	88/06	88/19	88/25	88/43
			88/56	89/02	89/20	89/33	89/39	89/57	90/10
			90/16	90/36	90/49	90/55	91/13	91/26	91/32
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			97/35	97/41	97/59	98/12	98/18	98/36	98/49
			98/55	99/13	99/26	99/32	100/34	100/47	100/59
			101/07	101/24	101/39	101/51	102/03	102/15	102/34
			102/49	103/01	103/13	103/25	103/57	104/12	104/24
			104/36	104/58	105/11	105/23	105/35	105/47	106/08
			106/23	106/35	106/47	106/59	107/11	107/31	107/39
			107/51	109/48	110/01	110/14	110/34	110/47	110/59
			111/18	111/31	111/45	112/05	112/18	112/30	127/13
			127/26	127/38	127/50	128/14	128/27	128/39	128/51
			131/36	131/51	132/03	132/15	132/39	132/54	133/06
			133/18	133/55	134/08	134/20	148/01	148/13	148/27
			149/04	149/18	149/50	150/02	150/16	150/53	151/07
			153/13	153/24	153/38	154/16	154/32	154/49	155/28
			155/44	156/01	172/17	172/31	172/44		
XCRC1	013634		146/28	146/44#	147/25				
XMIT	030560	MC	9/38#	30/06	30/21	30/37	30/56	32/12	32/42
			33/02	33/24	33/49	34/15	34/40	35/05	35/31
			156/21						
XMSK	000072		13/38#	36/03	36/24	36/60	37/36	38/51	39/16
			39/54	40/24	40/59	41/31	42/02	42/34	43/05
			43/37	44/18	45/01	45/45	46/20	46/55	47/31
			48/06	48/42	49/17	49/53	50/28	51/02	51/35
			52/09	52/42	53/16	53/49	54/23	54/58	55/31
			56/04	56/38	57/11	57/44	58/17	58/50	59/32
			60/16	60/58	61/43	62/11	62/44	63/17	63/51
			64/24	64/58	65/31	66/05	66/38	67/11	67/44
			68/18	68/52	69/26	69/60	70/33	71/18	72/03
			72/55	73/50	74/54	76/02	76/56	77/54	78/60
			80/09	81/27	82/48	83/42	84/25	108/18	108/35
XOR.	030573	MC	9/44#	163/43	165/07	166/25			
XXX	016127		17/53	17/60	173/03#				
X.CLK	031174	MC	12/14#	100/45	100/57	101/37	101/49	102/01	102/13
			102/47	102/59	103/11	103/23	104/10	104/22	104/34
			105/09	105/21	105/33	105/45	106/21	106/33	106/45

```
 0001 PMUXR    MACRO REV 06.70         14:28:59 08/05/82
01              ;*****************************************************************
02              ;
03              ; DESCRIPTION:  PROGRAMABLE MUX RELIABILITY
04              ;
05              ;
06              ; CUSTOM SYSTEMS INC, 1981
07              ;*****************************************************************
                        .TITL   PMUXR
09        000001        .DUSR   X=1
10              ;1.0    PROGRAM NAME - PMUXR.SR
11              ;
12              ;2.0    REVISION HISTORY:
13              ;               REV             DATE            COMMENTS
14              ;               00              06/26/81
15              ;               01              09/17/81  ;TEXT CORRECTIONS, AND OUTPUT XFERS
16              ;
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 CHASIS CONTAINING ANY COMBO OF
22              ;        PTI OR PSI CONTROLLERS NOT TO EXCEED 256 LINES.
23              ;3.5     OPTIONAL HAREWARE SUPPORTED:
24              ;        DCU 50 OR DCU 200 (BACKPLANE JUMPER PLUG REQUIRED)
25              ;
26              ;4.0    TEST REQUIREMENTS -
27              ;        JUMPER PLUGS REQUIRED FOR MODEM SIGNAL TESTING.
28              ;
29              ;5.0    SUMMARY
30              ;
31              ;        THE PROGRAMABLE 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.
38              ;
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 DMAN6 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
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```
 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?WPD   8.
03
04              ;8.2.2  SWITCHES DEFINED FOR PMUXR (ADDENDUM TO 8.2)
05              ;
06              ;       BIT     OCTAL   BINARY  INTERPRETATION
07              ;               VALUE   VALUE
08              ;        F                1     REQUEST OPERATOR PARAMS
09              ;               000001   0      NO PARAMS
10              ;
11              ;        E      000002   1      PROCEED FROM ERROR
12              ;                       0      -------
13              ;
14              ;        D      000004   1      SKIP PHASE 5 FOR DUAL MODE
15              ;                       0      -------
16              ;
17              ;        C      000010   1      INHIBIT LINE ASSIGN PRINTOUT
18              ;                       0      -------
```

```
!0005 PMUXR
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 SPECIFATIONS 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
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```
0006 PMUXR
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.
```

```
                ;10.0   PROGRAM OUTPUT/ERROR DESCRIPTION -
                ;
                ;10.1   "DCU FAILED TO START" THIS MESSAGE WILL
                ;       INDICATE THAT THE DCU UPON LOADING ITS MEMORY
                ;       OR WHEN STARTING THE PROGRAM DID NOT GO BUSY
                ;       AFTER A CERTAIN DELAY TIME.
                ;
                ;       HINT - COULD BE WRONG DEVICE CODE -
                ;
                ;10.2   "DCU FAILED TO STOP" INDICATES THAT DCU UPON
                ;       LOADING ITS MEMORY OR UPON EXECUTING A STOP SUBROUTINE
                ;       DID NOT STOP OR GO NOT BUSY AFTER A CERTAIN DELAY
                ;       TIME.
                ;
                ;10.3   "POWER FAIL" INDICATES A POWER FAIL ON THE
                ;       HOST CHASIS-
                ;
                ;10.4   THE FOLLOWING ERROR MESSAGES REFER TO MODES
                ;       (ABCD) WHEN TESTING LINE MODULES -
                ;
                ;       10.4.1 "TRANSMITTER (OR RECEIVER) FAILED TO SET DONE"
                ;       -APPEARS WHEN TRANSMIT OR RECEIVE COUNT FOR AN ACTIVE
                ;       LINE REMAINS 0 AFTER A SPECIFIC TIME INTERVAL AS DE-
                ;       TERMINED BY THE COUNTER IN MCW WORD.
                ;
                ;
                ;       10.4.2 "LOSS OF LINE ACTIVITY" - APPEARS WHEN A LINE
                ;       FAILS TO SET BLOCK DONE AFTER STARTING FOR A SPECIFIC
                ;       AMOUNT OF TIME.  A MAXIMUM TIME COUNTER IS PROVIDED
                ;       FOR THIS PURPOSE WHICH IS COUNTED EVERY TIME THE
                ;       MONITOR ROUTINE (DMN6) IS CALLED.  ITS TIME OUT VALUE
                ;       IS GIVEN IN "TIMEX".
                ;
                ;       10.4.3 ANY STATUS ERROR IS REPORTED AS "PARITY ERROR",
                ;       "FRAMING ERROR" OR "OVERRUN ERROR".
                ;
                ;       10.4.4 AN ERROR MESSAGE APPEARS WHEN TRANSMITTED AND
                ;       RECEIVED DATA DEFER FROM EACH OTHER, IN WHICH "GOOD"
                ;       REFERS TO THE TRANSMITTED AND "BAD" REFERS TO THE
                ;       RECEIVED DATA.
                ;
                ;       10.4.5 "FAILED TO DETECT BREAK" - APPEARS WHEN AN ASYNC
                ;       LINE RECEIVES FIVE NULL CHARACTERS IN A ROW WITHOUT
                ;       A FRAMING ERROR DURING A BREAK SEQUENCE.  (A BREAK
                ;       SEQUENCE CONSISTS OF OUTPUTTING A SEQUENCE OF A NULL,
                ;       TWO BREAK AND TWO NULL CHARACTERS.)
                ;
                ;       10.4.6 "FAILURE TO OPERATE IN XPARENCY" - APPEARS WHEN
                ;       THE FIRST CHARACTER RECEIVED AFTER CHANGING XPARENCY
                ;       MODE IN A SYNC LINE IN NOT A DLE CHARACTER.
```

```
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 RECVS TOO FAR APART"
41              ;       -APPEARS WHEN XMIT COUNT<1/2(RECV COUNT) OR RECV COUNT
42              ;       <1/2(XMIT COUNT).
```

```
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.
```

```
!0011 FMUXR
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.
```

```
!0012 PMUXR
01              ;11.8   DESCRIPTION OF COMMUNICATION SYSTEM I/O FUNCTIONS:
02              ;
03              ;       DEVICE CODES MUX = 34 (OCTAL)
04              ;                    CRC = 35 (OCTAL)
05              ;
06              ;
07              ;       DOA 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
```

```
3 PMUXR
                ;       DOC AC/MUX      SPECIFIES ON/OFF CONTROL OF TRANSMITTER
                ;                       OR RECEIVER, OUTPUT SYNC AND DLE CHARAC-
                ;                       TERS (SYNC ONLY), AND LINE CHARACTER-
                ;                       ISTICS.
                ;
                ;
                ;               BITS 0-1        00=XMIT/RECV CONTROL
                ;
                ;               BITS 2-14       NOT USED
                ;
                ;               BIT 15          0=OFF
                ;                               1=ON
                ;
                ;
                ;               BITS 0-1        01=SYNC CHARACTER (SYNC ONLY)
                ;
                ;               BITS 2-7        NOT USED
                ;
                ;               BITS 8-15       SYNC CHARACTER
                ;
                ;
                ;               BITS 0-1        11=DLE CHARACTER (SYNC ONLY)
                ;
                ;               BITS 2-7        NOT USED
                ;
                ;               BITS 8-15       DLE CHARACTER
```

```
!0014 PMUXR
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 DOA 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
```

```
!0016 PMUXR
01              ;       DIC AC/MUX (CONTINUED)
02              ;
03              ;                       MODEM STATUS
04              ;
05              ;               BIT 11          CD STATUS
06              ;
07              ;                               1=CD IS ON
08              ;                               0=CD IS OFF
09              ;
10              ;               BIT 12          CTS STATUS
11              ;
12              ;                               1=CTS ON
13              ;                               0= CTS OFF
14              ;
15              ;               BIT 13          DSR STATUS
16              ;
17              ;                               1= DSR ON
18              ;                               0= DSR OFF
19              ;
20              ;               BIT 14          RING STATUS
21              ;
22              ;                               1= RING ON
23              ;                               0= RING OFF
24              ;
25              ;               BIT 15          MODEM STATUS CONTROL
26              ;
27              ;                               1= MODEM STATUS
```

```
!0017 PMUXR
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              ;               'NIOS 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).
```

```
!0018 PMUXR
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              ;                               BIT8            BIT9
15              ;                                1               1       FIRST LINE
16              ;                                1               0       MIDDLE LINE(S)
17              ;                                0               1       LAST LINE
18              ;       BITS 10-13      NOT USED
19              ;
20              ;       BIT 14          BLOCK IS READY FOR CHECKING (BLOCK DONE)
21              ;
22              ;       BIT 15          0=ASYNC LINE
23              ;                       1=SYNC LINE
24              ;
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)
```

```
!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
```

```
!0021 PMUXR
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
```

```
 0001 UMUXR    MACRO REV 06.70         15:42:36 08/05/82
01              ;
02              ;
03              ;
04              ;*****************************************************************
05              ;
06              ;
07              ; DESCRIPTION:  UMUX RELIABILITY
08              ;
09              ;
10              ; CUSTOM SYSTEMS INC, 1981 1982
11              ;*****************************************************************
                        .TITL   UMUXR
13      000001          .DUSR   X=1
14              ;1.     PROGRAM NAME:   UMUXR.SR
15              ;
16              ;2.   REVISION HISTORY:
17              ;
18              ;               REV.            DATE            CHANGES
19              ;
20              ;               00              09/18/81
21              ;               01              12/07/81        T.O. CTR XMIT, REC, TIMEX, OPER PARAMS
22              ;               02              01/21/82        REDUCED # OF BRKS, SLOOP
23              ;               03              02/04/82        NO INITZ ON START-UP
24              ;3.   MACHINE REQUIREMENTS:
25              ;3.1    NOVA(EXCEPT MICRO)/ECLIPSE FAMILY PROCESSOR
26              ;3.2    16K READ/WRITE MEMORY
27              ;3.3    CONSOLE TELETYPE
28              ;3.4    ONE ASYNC,ONE SYNC OR BOTH UMUX TYPE CONTROLLER BOARDS.
29              ;3.5    TEST PLUGS (IF MODEMS ARE TO BE TESTED)
30              ;
31              ;4.   TEST REQUIREMENTS:
32              ;       SAME AS IN 3.
33              ;
34              ;5.   SUMMARY:
35              ;       THE UMUX CONTROLLER RELIABILITY PROGRAM IS A MAINTENANCE
36              ;       PROGRAM DESIGNED TO EXERCISE UMUX CONTROLLER BOARDS.
37              ;       THE LINES ARE TESTED UNDER LOOPBACK MODE
38              ;       USING RANDOMLY GENERATED LINE CHARACTERISTICS AND
39              ;       CHARACTERS.  SELECTION OF LINES FOR TESTING IS DONE VIA
40              ;       CONSOLE TELETYPE AND THE OPERATOR HAS AN OPTION TO
41              ;       SPECIFY THE LINE CHARACTERISTICS AND CHARACTERS TO BE
42              ;       TRANSMITTED ON ANY OR ALL OF THE LINES UNDER TEST.
43              ;
44              ;6.   RESTRICTIONS:
45              ;       FOR TESTING MODEMS, EIA INTERFACE ON THE ASYNC
46              ;       LINES MUST BE USED.
```

```
!0002 UMUXR
01              ;7.   PROGRAM DESCRIPTION/THEORY OF OPERATION:
02              ;       THE PROGRAM IS IN FOUR BASIC PARTS: INITIALIZATION,
03              ;       INTERRUPT ROUTINE, CHECK ROUTINE AND MONITOR ROUTINE.
04              ;       THE OPERATION AND INTERACTION OF THESE ROUTINES IS
05              ;       EXPLAINED BELOW.
06              ;
07              ;7.1    INITIALIZATION- AT START THE PROGRAM RESETS THE UMUX
08              ;       BOARD, THE PROGRAM WILL USE THE NORMAL TELETYPE
09              ;       I/O ROUTINES FOR THE CONSOLE.
10              ;
11              ;        THE PROGRAM WILL ASK
12              ;       A SERIES OF QUESTIONS TO THE OPERATOR AS DESCRIBED
13              ;       IN SEC. 9. OPERATOR INPUTS DEFINE THE DEVICE CODE
14              ;       OF UMUX BOARD, LINES AND MODEMS TO BE TESTED.
15              ;       THE PROGRAM WILL THEN DEFINE THE LCB BLOCKS (SEE 11.2)
16              ;       FOR ACTIVE LINES, ALLOCATE TRANSMIT AND RECEIVE BUFFERS,
17              ;       CHOOSE RANDOM LINE CHARACTERISTICS AND BLOCK LENGTHS
18              ;       AND FILL THE TRANSMIT BUFFERS WITH RANDOM DATA.
19              ;       BREAK CHARACTERS ARE LOADED AT RANDOM INTERVALS IN
20              ;       THE TRANSMIT TABLE. A SPECIFIC
21              ;       ON/OFF SEQUENCE IS SELECTED FOR THE ASYNC LINES (SEE
22              ;       GMOD AND GAMOD).
23              ;
24              ;       AFTER ALL INITIALIZATION IS COMPLETED, THE DMAIN
25              ;       SUBROUTINE IS CALLED WHICH TURNS OFF AND INITIALIZES
26              ;       ALL LINES (EXCEPT THE CONSOLE LINE IF APPLICABLE),
27              ;       OUTPUTS LINE CHARACTERISTCS, TURNS ON ACTIVE TRANSMITTERS,
28              ;       RECEIVERS AND MODEMS, AND OUTPUTS INITIAL MODEM STATES.
29              ;       THIS STARTS THE ACTUAL PROGRAM OPERATION.
30              ;
31              ;7.2    MONITOR ROUTINE (OR DMANS)- THIS ROUTINE IS CALLED
32              ;       PERIODICALLY  AS A SUBROUTINE BY THE CHECK ROUTINE.
33              ;       IT DETECTS WHEN A LINE HAS TRANSMITTED AND RECEIVED
34              ;       (VIA EOT CHARACTER) A FULL BLOCK OF DATA, THEN SHUTS
35              ;       DOWN THE LINE AND SETS A BLOCK DONE BIT IN THE MCW
36              ;       (BIT 14) FOR THE CHECK ROUTINE.  IT ALSO OUTPUTS NEW
37              ;       LINE CHARACTERISTICS AND RESTARTS A LINE IF BIT 1
38              ;       OF THE MCW IS SET.
39              ;
40              ;7.3    CHECK ROUTINE- THIS MONITORS THE LINE ACTIVITY, AND,
41              ;       UPON RECEIPT OF THE BLOCK DONE BIT, COMPARES THE
42              ;       TRANSMIT AND RECEIVE DATA AND RECORDS AND PRINTS OUT
43              ;       ANY ERROR CONDITIONS. AFTER CHECKING ALL LINES, IF
44              ;       THERE ARE NO ERRORS OR IF SWITCH 1 IS SET, IT LOADS
45              ;       NEW LINE CHARACTERISTICS IN THE CONT WORD, GENERATES
46              ;       A NEW BLOCK OF DATA IF USER SELECTED DATA WAS NOT LOADED,
47              ;       AND SIGNALS THE MONITOR TO RESTART THE LINE BY SETTING
48              ;       BIT 1 OF THE MCW WORD. THIS PROCESS IS REPEATED
49              ;       CONTINUALLY FOR ALL LINES. MODEMS ARE HANDLED
50              ;       IN A SIMILAR MANNER.
```

```
!0003 UMUXR
01              S?WPD 8
02              ;       SWITCH 15(F) = 0        DO NOT CHANGE LINE CHARACTERISTICS
03              ;                               IF AN ERROR OCCURS OR IN CASE OF
04              ;                               OPERATOR SELECTION OF LINE
05              ;                               CHARACTERISTICS.
06              ;                    = 1        CHANGE LINE CHARACTERISTICS.
```

```
!0004 UMUXR
01              ;9.     OPERATING PROCEDURE/OPERATOR INPUT:
02              ;9.0      CONNECT THE MODEM TEST PLUGS - IF IT IS DESIRED TO
03              ;         TEST ANY MODEM LINES.  SET ANY SWITCHES IF NECESSARY.
04              ;9.1      LOAD THE TEST PROGRAM VIA THE BINARY LOADER.
05              ;9.2      THE PROGRAM WILL REQUEST THE DEVICE CODE TO BE TYPED.
06              ;         THE OPERATOR SHOULD RESPOND BY TYPING THE TWO DIGIT
07              ;         OCTAL DEVICE CODE ASSIGNED TO THE COMMUNICATIONS
08              ;         SYSTEM.  THIS DEVICE CODE (EITHER 34 OR 44) IS TO BE
09              ;         FOLLOWED BY A CARRIAGE RETURN.
10              ;9.3      TYPE 1 FOR DETAILED LINE CHARACTERISTICS
11              ;         0 IF NOT
12              ;9.4      OPERATOR WILL TYPE 1 OR 0 TO THE TEST PLUG OPTION.
13              ;         IF TESTING OF THE MODEM IS NOT DESIRED, TYPE A 0.
14              ;         (NOTE: EIA INTERFACE ON ASYNC LINES MUST BE
15              ;         USED FOR MODEM TESTING.)
16              ;9.5      THE PROGRAM WILL REQUEST THE COMM. LINES THAT
17              ;         THE OPERATOR WANTS TO BE TESTED.
18              ;         THE OPERATOR MAY DEFINE A GROUP OF LINES FOR TESTING
19              ;         BY TYPING (FIRST LINE, SLASH, LAST LINE).  SINGLE
20              ;         LINES MAY BE TESTED BY TYPING THE LINE NUMBER.  ALL
21              ;         LINE NUMBERS ARE IN DECIMAL.  LINES OR GROUPS OF LINES
22              ;         ARE SEPARATED FROM EACH OTHER VIA COMMAS WITH THE
23              ;         FINAL LINE OR GROUP ENDING IN A CARRIAGE RETURN.  FOR
24              ;         EXAMPLE: 0,4/7,12 "CARRIAGE" -LINES 0,4,5,6,7 AND 12
25              ;         WILL BE EXERCISED.  THE LINE FEED CHARACTER MAY
26              ;         BE USED LIKE A COMMA WHEN INPUT FORMATTING IS
27              ;         NECESSARY.  TYPING AN "N" (NO LINES OF THIS TYPE)
28              ;         DOES NOT REQUIRE A CARRIAGE RETURN.
29              ;
30              ;9.6      IF MODEM LINES ARE TO BE TESTED, TYPE THE LINE NUMBERS
31              ;         IN THE FORMAT DESCRIBED ABOVE.
32              ;         A TEST FIXTURE IS REQUIRED FOR THE MODEM TEST.
33              ;
34              ;NOTE:  THE PROGRAM WILL DETECT AN ERROR AND REPEAT THE INPUT
35              ;       REQUEST IF ANY OF THE FOLLOWING INPUT ERRORS ARE COM-
36              ;       MITTED:
37              ;              1. AN ILLEGAL LINE NUMBER SUCH AS 9,10,11
38              ;                 OR GREATER THAN 12(DECIMAL) IS TYPED.
39              ;              2. MULTIPLY DEFINED LINES.
40              ;              3. A SECOND LINE (FOLLOWING SLASH) LESS THAN
41              ;                 FIRST LINE.
```

```
                ;9.7    IF OPERATOR INPUT IS DESIRED, THE PROGRAM WILL ASK
                ;       A SERIES OF QUESTIONS TO BE ANSWERED AS OPERATOR INPUTS.
                ;       ONLY THE CHARACTERISTICS UNIQUE TO THAT TYPE OF LINE
                ;       (ASYNC OR SYNC) WILL BE REQUIRED.  IF MORE THAN ONE
                ;       LINE IS DESIRED, THE PROGRAM WILL LOOP UNTIL A "0"
                ;       IS GIVEN TO THE LAST QUESTION.  THESE CHARACTERISTICS
                ;       WILL REMAIN ON THOSE LINES REQUESTED UNTIL SWITCH 15
                ;       IS RAISED.  "ALL LINES OF THIS TYPE" MEANS ALL DEFINED
                ;       ASYNC OR SYNC LINES WILL RECEIVE THE
                ;       OPERATOR DESIRED PARAMETERS.  IF A "1" IS ANSWERED TO
                ;       THIS QUESTION,   TYPE THE ADDRESS OF THE FIRST
                ;       LINE NUMBER OF THE DESIRED TYPE (ASYNC OR SYNC).
                ;
                ;10.    PROGRAM OUTPUT/ERROR DESCRIPTION:
                ;10.1     THE PROGRAM ENTERS AN ERROR STATE WHEN RECEIVER AND
                ;         TRANSMITTER DATA DO NOT COMPARE, A FAULTY STATUS CON-
                ;         DITION EXISTS, AN OUT OF SEQUENCE OR UNEXPECTED EVENT
                ;         OCCURS.  AN ERROR MESSAGE TO THE OPERATOR WILL BE
                ;         TYPED AT THE CONSOLE TELETYPE/LPT.  DURING THE PRESEN-
                ;         TATION OF THE ERROR MESSAGE, NORMAL OPERATION WILL
                ;         CONTINUE ON THE OTHER LINES.  WHEN THE ERROR MESSAGE IS
                ;         COMPLETE, THE CONDITION OF THE LINE IS MAINTAINED IF
                ;         SWITCH 15 IS RESET.  THE OPERATOR MAY SCOPE THE LINE
                ;         TO DETERMINE THE CAUSE OF FAILURE.
                ;
                ;10.2     SETTING SWITCH 15(1) WILL ALLOW NEW PSEUDO RANDOM NUM-
                ;         BERS TO BE GENERATED AFTER THE ERROR STATE HAS BEEN
                ;         ENTERED.  ERROR MESSAGES WILL CONTINUE TO BE TYPED AS
                ;         ERRORS ARE DETECTED.
                ;
                ;10.3     A PERIODIC PRINTOUT OF ACCUMULATED TRANSMIT WORDS IS
                ;         PROVIDED AFTER EACH PASS.  THIS NUMBER SHOULD ALWAYS
                ;         BE INCREASING AND IT IS JUST AN INDICATION THAT
                ;         ACTIVITY IS TAKING PLACE.
                ;
                ;10.4     ERROR MESSAGES:
                ;10.4.1   "TRANSMITTER (OR RECEIVER) FAILED TO SET DONE"
                ;         -APPEARS WHEN TRANSMIT OR RECEIVE COUNT FOR AN ACTIVE
                ;         LINE REMAIN 0 AFTER A SPECIFIC TIME INTERVAL AS
                ;         DETERMINED BY THE COUNTER IN MCW WORD.
                ;10.4.2   "LOSS OF LINE ACTIVITY" -APPEARS WHEN A LINE FAILS
                ;         TO SET BLOCK DONE AFTER STARTING FOR A SPECIFIC
                ;         AMOUNT OF TIME.  A MAXIMUM TIME COUNTER IS PROVIDED
                ;         FOR THIS PURPOSE WHICH IS COUNTED EVERY TIME THE
                ;         MONITOR ROUTINE (DMN6) IS CALLED.  ITS TIME OUT
                ;         VALUE IS GIVEN IN "TIMEX".
                ;10.4.3   ANY STATUS ERROR IS REPORTED AS "PARITY ERROR",
                ;         "FRAMING ERROR" OR "OVERRUN ERROR".
                ;10.4.4   AN ERROR MESSAGE APPEARS WHEN TRANSMITTED AND
                ;         RECEIVED DATA DEFER FROM EACH OTHER, IN WHICH
                ;         "GOOD" REFERS TO THE TRANSMITTED AND "BAD" REFERS
                ;         TO THE RECEIVED DATA.
                ;10.4.5   "FAILED TO DETECT BREAK" -APPEARS WHEN AN ASYNC
                ;         LINE RECEIVES FIVE NULL CHARACTERS IN A ROW WITHOUT
                ;         A FRAMING ERROR DURING A BREAK SEQUENCE.  (A BREAK
                ;         SEQUENCE CONSISTS OF OUTPUTTING A SEQUENCE OF
                ;         A NULL, TWO BREAK AND TWO NULL CHARACTERS.)
                ;10.4.6   "FAILURE TO OPERATE IN XPARENCY" -APPEARS WHEN
                ;         THE FIRST CHARACTER RECEIVED AFTER CHANGING XPARENCY
                ;         MODE IN A SYNC LINE IS NOT A DLE CHARACTER.
```

```
01              ;10.4.7   "UNDERRUN IN XPARENT MODE WITHOUT DLE" -APPEARS
02              ;         WHEN TWO SUCCESIVE SYNC CHARACTERS ARE RECEIVED
03              ;         WHILE UNDERRUNNING IN TRANSPARENT MODE.
04              ;10.4.8   "LINE FAILED TO UNDERRUN" -APPEARS WHEN THE
05              ;         UNDERRUN SEQUENCE OF DLE AND SYNC IN TRANSPARENT
06              ;         MODE OR SYNC CHARACTERS IN NON-TRANSPARENT MODE
07              ;         IS BROKEN BY A NON-SYNC CHARACTER.
08              ;10.4.9   "RECEIVE BUFFER OVERFLOW" -APPEARS WHEN THE END
09              ;         OF RECEIVE BUFFER IS REACHED BEFORE THE END OF
10              ;         TRANSMIT BUFFER.
11              ;10.4.10  "CRC DOES NOT CHECK" -APPEARS WHEN THE CALCULATED
12              ;         CRC DOES NOT MATCH WITH THE HARDWARE'S CRC.
13              ;10.4.11  "MODEM LINE FAILED TO INTERRUPT" -APPEARS WHEN
14              ;         NO MODEM INTERRUPT IS RECEIVED FROM AN ACTIVE LINE
15              ;         AFTER SENDING OUT NEW MODEM STATUS AND WAITING
16              ;         FOR A SPECIFIC AMOUNT OF TIME.
17              ;10.4.12  "MODEM INTERRUPT FROM ILLEGAL LINE" -APPEARS AFTER
18              ;         RECEIVING MODEM INTERRUPT FROM AN INACTIVE LINE.
19              ;10.4.13  "FALSE INTERRUPT-NO CHANGE IN STATUS" -APPEARS
20              ;         WHEN MODEM INTERRUPT IS RECEIVED FROM A LINE
21              ;         WITHOUT CHANGE IN MODEM STATUS.
22              ;10.4.14  ANY MODEM STATUS RECEIVED THAT DEFFERS FROM THE
23              ;         STATUS SENT OUT IS REPORTED AS AN ERROR WITH A
24              ;         MESSAGE THAT, FOR EXAMPLE, MAY READ LIKE-
25              ;         "CHANGE IN RING NO CHANGE IN RTS".
26              ;10.4.15  ANY INTERRUPT FROM A DEVICE OTHER THAN MUX OR
27              ;         FROM AN INACTIVE LINE CAUSES AN ERROR MESSAGE
28              ;         TO APPEAR WITH THE INTERRUPTING DEVICE CODE OR
29              ;         LINE NUMBER IN THE MESSAGE.
30              ;10.4.16  "UNIDENTIFIABLE ERROR-XMITS RECVS TOO FAR APART"
31              ;         -APPEARS WHEN XMIT COUNT<1/2(RECV COUNT) OR
32              ;         RECV COUNT<1/2(XMIT COUNT).
```

```
!0007 UMUXR
01              ;11.1   DESCRIPTION OF COMMUNICATION SYSTEM I/O FUNCTIONS:
02              ;
03              ;       DEVICE CODES MUX = 34/44 (OCTAL)
04              ;                    CRC = 35/45 (OCTAL)
05              ;
06              ;
07              ;       DOA 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              ;               BIT 15          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 14          1=TURN ON RTS
41              ;                               0=TURN OFF RTS
42              ;
43              ;               BIT 15          1=TURN ON DTR
44              ;                               0=TURN OFF DTR
```

```
!0008 UMUXR
01              ;       DOC AC,MUX      SPECIFIES ON/OFF CONTROL OF XMIT/RECV
02              ;                       OR MODEM, OUTPUT SYNC AND DLE CHARAC-
03              ;                       TERS (SYNC ONLY), AND LINE CHARACTER-
04              ;                       ISTICS.
05              ;
06              ;
07              ;               BITS 0-2        000=XMIT/RECV CONTROL
08              ;                               001=MODEM CONTROL
09              ;
10              ;               BITS 3-14       NOT USED
11              ;
12              ;               BIT 15          0=OFF
13              ;                               1=ON
14              ;
15              ;
16              ;               BITS 0-1        01=SYNC CHARACTER (SYNC ONLY)
17              ;
18              ;               BITS 2-7        NOT USED
19              ;
20              ;               BITS 8-15       SYNC CHARACTER
21              ;
22              ;
23              ;               BITS 0-1        11=DLE CHARACTER (SYNC ONLY)
24              ;
25              ;               BITS 2-7        NOT USED
26              ;
27              ;               BITS 8-15       DLE CHARACTER
```

```
01              ;       DOC AC,MUX (CONTINUED)
02              ;
03              ;               BITS 0-1        10=LINE CHARACTERISTICS
04              ;                               SPECIFIES PARITY, STOP BITS,
05              ;                               LINE SPEED, CHAR CODE LEVEL, AND
06              ;                               LOOPBACK CONTROL
07              ;
08              ;               BITS 2-5        NOT USED
09              ;
10              ;               BIT 6           SELECT ONE OF TWO POLYNOMIALS
11              ;                               (SYNC ONLY)
12              ;
13              ;               BITS 5-8        CLOCK SELECT (ASYNC ONLY)
14              ;
15              ;                               0000 = 0        BAUD
16              ;                               0001 = 19200    BAUD
17              ;                               0010 = 19200    BAUD
18              ;                               0011 = 75       BAUD
19              ;                               0100 = 19200    BAUD
20              ;                               0101 = 19200    BAUD
21              ;                               0110 = 600      BAUD
22              ;                               0111 = 2400     BAUD
23              ;                               1000 = 9600     BAUD
24              ;                               1001 = 4800     BAUD
25              ;                               1010 = 19200    BAUD
26              ;                               1011 = 1200     BAUD
27              ;                               1100 = 2400     BAUD
28              ;                               1101 = 300      BAUD
29              ;                               1110 = 150      BAUD
30              ;                               1111 = 110      BAUD
31              ;
32              ;               BITS 9-10       SPECIFY NUMBER OF STOP BITS
33              ;                               (ASYNC ONLY)
34              ;
35              ;                               00 = 1 STOP BIT
36              ;                               01 = 2 STOP BITS IF NOT 5 LEVEL CODE
37              ;                                  = 1.5 STOP BITS IF 5 LEVEL CODE
38              ;                               10 = RESERVED
39              ;                               11 = RESERVED
40              ;
41              ;               BITS 11-12      SPECIFY CODE LEVEL
42              ;
43              ;                               00 = 5 LEVEL CODE (ASYNC ONLY)
44              ;                               01 = 6 LEVEL CODE
45              ;                               10 = 7 LEVEL CODE
46              ;                               11 = 8 LEVEL CODE
47              ;
48              ;               BITS 13-14      PARITY SELECT
49              ;
50              ;                               00 = NO PARITY
51              ;                               01 = ODD PARITY
52              ;                               10 = EVEN PARITY
53              ;                               11 = RESERVED
54              ;
55              ;               BIT 15          LOOPBACK CONTROL
56              ;
57              ;                               0 = LOOPBACK OFF
58              ;                               1 = LOOPBACK ON
```

```
!0010 UMUXR
01              ;       DIA AC,MUX      SPECIFIES IMPLICIT ADDRESS OF INT-
02              ;                       ERRUPTING LINE, RECEIVE, MODEM, OR
03              ;                       TRANSMIT, AND FORCES A DOA 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
```

```
!0011 UMUXR
01              ;       DIC AC,MUX (CONTINUED)
02              ;
03              ;                       MODEM STATUS
04              ;
05              ;               BIT 11          CD STATUS
06              ;
07              ;                               1=CD IS ON
08              ;                               0=CD IS OFF
09              ;
10              ;               BIT 12          CTS STATUS
11              ;
12              ;                               1=CTS ON
13              ;                               0= CTS OFF
14              ;
15              ;               BIT 13          DSR STATUS
16              ;
17              ;                               1= DSR ON
18              ;                               0= DSR OFF
19              ;
20              ;               BIT 14          RING STATUS
21              ;
22              ;                               1= RING ON
23              ;                               0= RING OFF
24              ;
25              ;               BIT 15          MODEM STATUS CONTROL
26              ;
27              ;                               1= MODEM STATUS
```

```
!0012 UMUXR
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              ;               'NIOS 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).
```

```
!0013 UMUXR
01              ;11.2   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
08              ;
09              ;       BIT 2-3         NOT USED
10              ;
11              ;       BITS 4-7        TIME OUT COUNTER FOR XMIT OR RECEIVE INTR.
12              ;
13              ;       BITS 8-12       NOT USED
14              ;
15              ;       BIT 13          SYNC LINE RECEIVER SHOULD BE STARTED
16              ;
17              ;       BIT 14          BLOCK IS READY FOR CHECKING (BLOCK DONE)
18              ;
19              ;       BIT 15          0=ASYNC LINE
20              ;                       1=SYNC LINE
21              ;
22              ;
23              ;
24              ;               CONTROL REGISTER (CONT)
25              ;
26              ;       BIT 0           ERROR OCCURRED
27              ;
28              ;       BIT 1           USER SELECTED DATA LOADED
29              ;
30              ;       BITS 2-4        NOT USED
31              ;
32              ;       BITS 5-8        CLOCK SELECT (ASYNC ONLY)
33              ;
34              ;       BIT 6           CRC POLYNOMIAL FOR THIS LINE (SYNC ONLY)
35              ;
36              ;       BIT 9           NOT USED
37              ;
38              ;       BIT 10          STOP BITS (ASYNC ONLY)
39              ;
40              ;       BITS 11-12      CODE LEVEL
41              ;
42              ;       BITS 13-14      PARITY
43              ;
44              ;       BIT 15          ANALOG LOOPBACK MODE
```

```
!0014 UMJXR
01              ;               MODEM OUTPUT REGISTER (MOD)
02              ;
03              ;       BIT 0           MODEM ACTIVE
04              ;
05              ;       BIT 1           OUTPUT NEW MODEM STATUS
06              ;
07              ;       BITS 2-13       NOT USED
08              ;
09              ;       BITS 14-15      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 8-10       NOT USED
21              ;
22              ;       BITS 11-14      NEW (PRESENT) MODEM STATUS
```

```
!0015 UMUXR
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
```

```
!0016 UMUXR
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       NUMBER OF TIMES THROUGH MONITOR ROUTINE
26              ;
27              ;
28              ;
29              ;               TRANSMIT WORD TABLE (XTBL)
30              ;
31              ;       BIT 0           NOT USED
32              ;
33              ;       BIT 1           UNDERRUN FOR THE REST OF THE BLOCK SIZE
34              ;
35              ;       BIT 2           DLE CHARACTER FOLLOWS
36              ;
37              ;       BIT 3           0=LEAVE TRANSPARENCY
38              ;                       1=ENTER TRANSPARENCY
39              ;
40              ;       BITS 4-7        NOT USED
41              ;
42              ;       BITS 8-15       TRANSMIT DATA
43              ;
44              ;
45              ;
46              ;               RECEIVE WORD TABLE (XTBL+BL)
47              ;
48              ;
49              ;       BITS 0-3        NOT USED
50              ;
51              ;       BITS 4-7        ERROR STATUS
52              ;
53              ;       BITS 8-15       RECEIVE DATA WORD
```

```
!0017 UMUXR
01              ;11.3    TO AID IN TROUBLE SHOOTING, EXAMINE THE LCB'S FOR THE
02              ;         FAILING LINE(S) FOR ADDITIONAL INFORMATION.  TO FIND
03              ;         THE APPROPRIATE LCB STARTING ADDRESS, ADD THE LINE
04              ;         NUMBER TO LCBPTR AND TAKE THE CONTENTS OF THAT
05              ;         LOCATION.  A COMPARISON OF THE XMIT AND RECEIVE TABLES
06              ;         WILL PROVE VERY USEFUL IN IDENTIFYING THE PROBLEM.
07              ;         STARTING ADDRESSES OF XMIT AND RECEIVE TABLES ARE
08              ;         FOUND IN THE XTP AND RTP WORDS OF LCB BLOCK
09              ;         FOR THAT LINE.
10              ;
```

```
0018 UMUXR
                ;12.    SPECIAL NOTES/SPECIAL FEATURES:
                ;
                ;12.1   MODEM CONTROL TEST PLUG CONNECTS:
                ;
                ;               ASYNC
                ;
                ;       RTS X   TO      RING X    AND  DSR X+1
                ;       RTS X+1 TO      RING X+1  AND  DSR X
                ;       DTR X   TO      CTS X     AND  CD X+1
                ;       DTR X+1 TO      CTS X+1   AND  CD X
                ;
                ;               X= ANY EVEN NUMBERED LINE
                ;
                ;               SYNC
                ;
                ;       DTR     TO      RING AND CTS
                ;       RTS     TO      DSR  AND CD
                ;
                ;12.2   IF 20 MA CURRENT LOOP INTERFACE IS BEING USED,
                ;       DO NOT CONNECT MODEM TEST PLUGS FOR THAT PAIR
                ;       OF LINES.
                ;
                ;12.3   THE RANDOM NUMBERS ARE TRANSMITTED IN BLOCKS AT
                ;       A TIME AND COMPARED IN NON-INTERRUPT TIME.  THE
                ;       TRANSMIT/RECEIVE BUFFER AREAS ARE DIVIDED
                ;       ACCORDING TO HOW MANY LINES ARE ACTIVE-  THEN EACH
                ;       LINE IS GIVEN A RANDOM BLOCK LENGTH EVERY TIME
                ;       A NEW BLOCK IS SENT, WITHIN THE CONSTRAINTS OF THE
                ;       MAXIMUM BLOCK SIZE.  TO TRANSMIT LARGER BLOCKS
                ;       OF CHARACTERS AT A TIME, THE OPERATOR MAY WANT TO
                ;       SELECT FEWER LINES TO ACTIVATE.
                ;
                ;13.    RUN TIME: N/A

                        .EOT


0019 UMUXR
**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS
```