PRELIMINARY

CB149 SERIAL TELEMETRY MONITOR AND TEST SET DIGITAL RADIO SYSTEMS DESCRIPTION

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PURPOSE

This document describes the operating instructions for the GTPSIM program version 1.005B.

To aid in the implementation of the TABS (telemetry asynchronous block) protocol into digital radio systems, a program (GTPSIM) was developed. GTPSIM will simulate the GTP (general telemetry processor), and drive Terminal Radio Bays with the TABS protocol defined in Compatibility Bulletin #149 (CB149). This program was needed to develop the firmware (in the Terminal Radio Bays) that interfaces with a GTP.

HARDWARE REQUIREMENT

Your copy of GTPSIM will run on an AT&T PC 6300 or TOSHIBA 1100 PLUS PC or TOSHIBA 3100 PC. If you are using a PC 6300, with a METRABYTE COMM 422 board interface, (Metrabyte Corporation, Stoughton, MA) you can only operate your PC in the GTP simulation mode (see MODES OF OPERATION section). In this case, when you start your program, you must enter a "2" to indicate to the program that you are using the PC communication port 2. The 422 board should be set to the base address for COMM2 and RS-422 without the CTS or RTS signals as described in your METRABYTE data sheet. Your pin-outs are also described in the data sheet.

If you are using an External to PC RS-232C, to RS-422 converter with the RS-232C RTS (Request To Send) lead, you may use the LISTEN-IN MODE (see MODES OF OPERATION section). The recommended unit is the B & B Electronics RS-232C to RS-485 converter (model 485COR) with model 485ps power supply unit. Set up information is furnished with the unit. When running in this configuration, use either the PC 6300 or TOSHIBA 1100 PLUS. Connect the built-in PC serial port (COMM1) to the ME. Appendix B shows the cables and straps needed to allow the GTPSIM program to run. When the program is started, select COMM1 as your serial port by entering a "1" when prompted by the PC during program initialization.

GETTING YOUR DISKETTE READY

The GTPSIM program is sent out as a floppy diskette. This diskette should be copied onto a formatted system diskette. To format the diskettte, use the standard MS-DOS™ FORMAT command with a '/s' option. After formatting your system diskette, copy all the files from the GTPSIM diskette onto your system diskette. To copy the files, insert your GTPSIM diskette in A drive and the formatted system diskette in B drive. Then, input the MS-DOS copy command -- "copy a:*.* b:". After this copy is done, remove the diskettes from the drives. From now on use your newly created diskette (system diskette) to boot your computer. To do this, place the newly created diskette in drive A and reset the PC. The PC will start, and the GTPSIM program will begin to run following the start-up of MS-DOS. ***Diskette manipulation is necessary to avoid MS-DOS copyrights violation.***

After loading your data base, you can specify the start-up data base by modifying the file AUTOEXEC.BAT on your system diskette. AUTOEXE.BAT is a one line file consisting of the line "GTPSIM" and can be accessed by using the MS-DOS "TYPE" command. Enter GTPSIM to start the program. If you wish to "customize" your diskette to load a data base on boot of the system, use your MS-DOS EDLIN line editor to change that line to "GTPSIM -f xxxxx". The "xxxxx" denotes the data base you want to load at the start of the program. For example, if you enter "gtpsim -f 135fd", the starting data base would describe an ADR 135 Frequency Diversity Alarm Set.

When you look at your diskette, with a MS-DOS "DIR" command, it should contain data base files describing both the 135 and 90C Frequency Diversity Radio Systems and 135 Hot Standby Systems. You can use any of these files to boot your system or build your own data base as described in Appendix A.

DISKETTE FILES

The floppy diskette you receive contains the following files:

90ahs - An ASCII file defines the text to be output for alarm and status points for a 90a hot standby system.

90afd - An ASCII file defines the text to be output for alarm and status points for a 90a frequency diversity system.

90C - An ASCII file defines the text to be output for alarm and status points for a 90C system.

135fd - An ASCII file defines the text to be output for alarm and status points for a 135fd system.

135hs - An ASCII file defines the text to be output for alarm and status points for a 135hs system.

dgcode - A text file searched to locate diagnostic code information (90C and 135FD only).

gtpsim.exe - The executable program.

autoexec.bat - A MS-DOS start-up file.

cont.tim - An example of time based control input file.

cont.log - An example of a logic based control input file.

sers-g - A ASCII file that descrbes the FT SERIES G AS&C alarm text for a TCC.

sers-g.tma - A ASCII file that describes the FT SERIES G AS&C alarm text for a TMA.

sers-g.f1 - A ASCII file that describes the FT SERIES G AS&C alarm for a general application fault locate link.

sers-g.pm - A ASCII file that describes the FT SERIES G AS&C alarm for a general application performance monitor link.

dummy.db - A dummy data base description which will allow you to process AS&C data without text messages.

STARTING THE GTPSIM PROGRAM

When the program starts, the following information is displayed:

- BTL department which originated the program
- Name of the program
- Version number of the program
- Date and time.

To communicate with the bay, enter the selected serial port code. (You do not have to use a '2' on a PC 6300 if you are using an external protocol converter. You can enter a '1' with a PC 6300 with an external converter, and use the PC 6300 to listen in on links.) After the code is entered, the system parameters are displayed, followed by the starting user menu. The system parameters tell you the mode of the PC, the color state, and the COMM port you are using. This starting output is depicted in Figure 1.

MODES OF OPERATION

The GTPSIM program runs in two modes that change the level of menu presented to you. The modes are LISTEN and GTP simulate. On start, the program assumes a LISTEN state. In this state, the LISTEN menu is presented to you. Figure 1 shows the complete LISTEN menu.

INPUT REQUESTS

You can make an input selection with a single character followed by a carriage return. Only the first character of the input line is recognized as your request. The input is buffered by MS-DOS into a line. This means you can type your request, and if you make a mistake, you can use the BACK SPACE key to correct your input before you hit the RETURN key. When you hit the RETURN key, your command is entered.

LISTEN MENU OR MAIN MENU

In the LISTEN mode you have the following choices:

l - Listen in on a link
g - Enter/Exit GTP simulate mode
d - Diagnostic code information
! - escape to MS-DOS
c - turn color on or off
e - turn on or off TABS line error logging
b - send a TABS level 2 test message with PC loopback
x/q - exit the program

l option

This option will start listening in on a TABS link. In this mode, you will be prompted for some more follow-up information before listening starts. You will be asked to define the number of Switch Section Hops. This number is required by the output program to correctly display the FL (Fault Locating) hop numbers. (See output section.) The input number is the number of regenerators plus the number of repeater plus 1. If this number is not entered properly, the FL output report will contain the wrong number of hops. If you are not using the Fault Locate Link, enter any valid number. The number of working service channels/lines is asked for next. This number is also used in the output formatting programs. You need to specify the correct

number. If this number is not entered correctly, both the PM (Performance Monitoring) and FL output reports may cut off the higher numbered channels/lines.

You will be asked to select exception reports or regular reports. All the data collection made by the PC is the same. The only difference in the report is in the output formatting. In the exception report, the PC will scan the data collected on the FL or PM links, and report on that subset of lines or channels which meet the following criteria:

- If the PM or FL data indicates an out of FRAME in the measurement period, a line or channel will be entered on the list to be output.
- If the measured FL indicates an RDI bit set, an entry on the list will be made.
- If the reported number of parity errors is greater than or equal the number, you get to input next.

Upon completion of the data scan, the list of lines/channel will be output, followed by a report on each of the lines/channels up to the amount that will fill up the PC screen.

The report format is described in the output section. If you enter "e", you will be asked to input the number of parity errors to trigger a report. Then, you will be asked if you desire to log the reports. This implies that you can send a second copy. If you enter "prn", the data will be sent to the printer. If you enter another name, it will be used as a diskette file name to send the reports.

This option will also assume you want to active display option set on. (See output section.) Exception reporting is assumed on SERIES-G systems. Also , the "e" option is the recommended option for radio systems.

If you choose to specify the "n" option (regular reports), you need to specify the lowest service channel/line to be displayed on output. This is necessary because the output display will only fit 5 columns of the FL or PM data on the screen at one time. The protection channel is always displayed at the output This option is needed on a radio system larger than 1 by 4 when you look at data for the higher radio channels.

You will also be asked if you want to see all the AS&C bit maps or only want to see those display maps with active bits. The recommended option is 'a' or only those displays with active bits. This cuts down on display time and data you will have to look at. You will be required to specify if you are listening in on a VPM link. If so, you must enter a 'v' when prompted. This is because CB149 used the same messages for the PM link and the VPM link, and internally the PC must differentiate the two links. After this, the eavesdropping will go active and data will start coming out at you. The listening mode operates on all the radio TABS links. The outputs will be presented on the screen after collection. In the case of the AS&C link, this will be after a GTP AS&C response message when the link should be quiet for at least one poll time period. For the PM, FL, and VPM links, the program will report the data collected following a CB149 SYNC message. This collection will mean the reported FL or PM data will be delayed by one reporting period following the period in which the reported events occur. At this.point, the link should be one CB149 sync wait period.

To exit the LISTEN mode, you hit any key followed by the RETURN key. This will return you to the MAIN menu.

g option

The 'g' option will start the GTP simulation mode and allow you to command the BAY. If you are in the GTP simulation mode when the simulation mode is entered, you will exit it, and

return to the LISTEN mode. If you are in the LISTEN mode, you will enter the simulation mode.

The GTP simulation mode will display six new MAIN menu options. They are 't', 'a', 'p', 'f', 'v', and 's' (see Figure 2). These options are explained later. In the simulation mode, if you select one of the sub-menus 'a','f','p', or 'v', you will enable the PC's serial port transmitter which will cause the GTP and PC to malfunction. In effect, the two transmitters will 'buck' each other and neither will work properly. To prevent this, the system will remind you to disconnect the GTP before you are allowed to enter this mode.

d option

The 'd' option will be used by the operator to explain the two digit diagnostic code displayed on the terminal bay. To aid the operator in interpreting these codes, a file DGCODE.TXT was placed on the diskette. This file contains text for each defined diagnostic code in a radio system. After opting for a 'd', you will be asked for the code, and the diskette file will be searched for the code. If a valid code is found, it will be displayed on your screen.

! option

The '!' option will allow you to enter a MS-DOS command while the program remains in the computer. When the command is complete, control will be returned to the GTPSIM program. A few DOS commands that may be useful to the casual operator are: COPY, DATE, TIME, and DIR.

c option

The 'c' option will turn ON the color output for AS&C bit maps if it is OFF or turn OFF color if it is ON. The initial state of color is determined by the PC's serial port that was selected at the start of the program. If you use COMM2 (the PC 6300 option) you have color initially turned ON. Otherwise, color is initially turned OFF. This option only affects the bits maps in the AS&C outputs. The color option will not work well if you are expecting to get a printed output.

e option

The 'e' option will turn on or off the logging of the TABS error messages. The 'e' option will turn the option off or on. You must specify where to write the error test. The extra copy of the error will be sent to either diskette file or printer as you use in the follow up prompt.

b option

The 'b' option will be used as a self test of the PC. This option will expect the PC's RS-422 output to be looped back onto it's input. In this mode, a test message is sent out of the PC and checked on input for self checking the PC.

x/q option

The 'x' or 'q' options will cause the GTPSIM program to exit back to MS-DOS.

GTP SIMULATION MODE

In the GTP simulation mode, the MAIN menu is expanded to allow you to act like a GTP and request data from a terminal bay. In this mode, you can select a sub-menu for each tabs link. The links that can be selected are AS&C, PM, FL, and VPM. These options will each have their own sub-menu which will be explained by link.

AS&C SUB-MENU

The AS&C sub-menu is shown in Figure 3. The menu selection method is the same as the method used in the MAIN menu. If a selection requires more data, you will answer the follow-up questions asked by the PC. Each selection is explained below.

t command

This command is used to TEST a link. It will issue a TABS level 2 test message to the Monitored Equipment and wait for a reply. The reply is then verified and you are informed if the connections between the PC and the bay are correct. If connections are not, the command will fail and you should verify your connections and PC port assignments.

d command

The 'd' command will be the most used command. It will periodically collect data from the bay, and display the data it collected. This command will ask you if you want to see all the display maps or just the ones with active bits. It is recommended you use the 'a' input when running this command. The frequency of request is determined by the terminal bay based on information provided in a TABS configuration message for AS&C. The output is explained in the Output section of this document. A 'q' followed by a return will exit this loop.

0 (zero) command

The '0' command is used to simulate GTP remote commands to the terminal bay. This command will ask you to provide follow-up information regarding the HOP number, display, and point you want to set. You enter the data one line at a time as each piece is requested. When the data is complete, the remote command will be sent to the bay. Next the PC will wait 15 seconds and then ask the bay to report all the AS&C data.This is to allow you to get feedback as to whether or not your command took. You may abort this wait by hitting a RETURN key while waiting. Only one point may be set in each '0' command.

k command

This option will allow you to specify an output AS&C control point automatically. The automatic control point is either time based or logic based. The PC will assert this point based on an input control point file. The input file will specify up to 16 control points that can be set or cleared based on time or logic. The time based controls will allow you to set or clear a point every 'n' seconds as defined in the input file. The logic based controls will allow you to set or reset a control point based on the logical combining of any AS&C alarm or status points. Note that in the installation of radio systems it is sometimes required to start the 15 minute Performance Tests to bring in alarms on low error rates. These tests will time out on a radio system every 15 minutes, and have to be restarted by SCOTS. The format of these two files is described in an appendix.

h command

This command will be used to turn on and turn off the logging of the text string associated with AS&C points. If this option is off and you enter an 'h' command, the PC will write the text string for a AS&C point to both the PC console and another output port. If the port is a device on the PC (i.e., 'prn' for a printer port), the data will be sent to that device and the CRT. If the device is not a standard PC device, a file on PC disk will be created and the data sent there. This logging of AS&C data can be turned off if it is active by entering another 'h' command. If this option is turned on and no printer is present, or no disk is ready to receive data, the PC will stop and not function correctly.

l command

The 'l' command will load a new data base. A data base is the messages associated with each AS&C point. You will be asked to provide a file name to load. The file will be loaded and the command will end. If there is something wrong with your file, an error message will be issued, and you will be asked again. You may terminate the 'l' option by entering a 'p' at this point. Beware! Your data base may be destroyed at this time and you might get strange results.

f command

The 'f' option will reset the serial port on the PC. This may have to be done if the PC receiver 'hangs up'. A 'hang up' may be caused by switching from one port to another. The switching may produce noise which will get the PC's receiver stuck and no data is heard by the PC. This should be the first thing you try if you switch TABS links, or reset the bay and start getting error messages out of the PC.

a command

The 'a' command will scan the data base stored in the PC's memory. It will ask you if you want to see the terminal displays or regenerator displays. The points will be displayed one page at a time when the RETURN key is hit at the end of each page. A 'q' can be used to terminate this command prior to reaching the end of the data base. The data text messages are displayed by display number, point number, an 'A' or 'S' to indicate alarm or status point, and the associated text string. An 'X' and the text not used will be displayed for points defined but not assigned value in the data base.

b command

The 'b' command is like the 'a' command except it will display the control points defined in a system. This command will allow you to view the defined remote controls available to you to set.

? command

The '?' command will allow you to ask about an individual point. It will ask you for Terminal or Regenerator set and the display and point number. Using this information the PC will display the text for that specific point in the 'a' format.

p command

The 'p' command will exit the sub-menu and return you to the MAIN menu. When at the MAIN menu, the PC's transmitter is disabled if you are using an external RS-232 to RS-422 converter. (The RTS lead is turned OFF.) This will allow you to go to LISTEN mode in the MAIN menu directly without turning off the GTP simulation mode.

m command

The 'm' command will cause the PC to display the current sub-menu. After the menu is displayed, you are prompted to select the command you wish to execute.

PM SUB-MENU

The PM sub-menu is shown in Figure 4. This menu selection is the same as the method used in the MAIN menu. If a selection requires more data, you answer the follow-up questions asked by the PC. Each selection is explained below.

t command

The 't' command is used to TEST a link. It will issue a TABS level 2 test message to the monitored equipment and wait for a reply. The reply is then verified and you are told if it was good or not. The purpose of this command is to provide a quick check of the link to verify the cables are connected to the terminal bay correctly. If they are not, the command will fail and you should verify your connections and PC port assignments.

d command

The 'd' option will start polling the bay for PM information. The command will ask you to specify a measurement period, usually 60 seconds, over which to collect data. You will also be asked to provide the lowest service channel or line number you wish to report to your screen. This number will only be used in the displaying of the data to establish the first column of

output after the protection channel. The PC will ask the bay for a configuration message, and based on that and your input, ask the bay for data. The sequence of requests is:

1 - Issue a PM sync message
to start a measurement period.
2 - Wait one sync wait period.
3 - Issue a PM sync message.
4 - Wait one sync wait period.
5 - Request PM data from the bay.
6 - Report the PM data collected
over the period.
7 - Wait one user specified poll interval.
8 - Go to Step #3.

You can exit the 'd' command by hitting any key and a RETURN key.

h command

The 'h' option is the same logging option described in the LISTEN mode This option will send a second copy of your reports to either a printer or a diskette file.

f command

The 'f' option will reset the serial port on the PC. This may have to be done if the PC receiver 'hangs up'. A 'hang up' may be caused by switching from one port to another. The switching may produce noise which will get the PC's receiver stuck and no data is heard by the PC. This should be the first thing you try if you switch TABS links, or reset the bay and start getting error messages out of the PC.

p command

The 'p' command will exit the sub-menu and return you to the MAIN menu. When at the MAIN menu, the PC's transmitter is disabled if you are using an external RS-232 to RS-422 converter. (The RTS lead is turned OFF.) This will allow you to go to LISTEN mode in the MAIN menu directly without turning off the GTP simulation mode.

m command

The 'm' command will cause the PC to display the current sub-menu. After the menu is displayed, you are prompted to select the command you wish to execute.

FL SUB-MENU

The FL sub-menu is shown in Figure 5. This menu selection is the same as the method used in the MAIN menu. If a selection requires more data, you answer the follow-up questions asked by the PC. Each selection is explained below.

t command

The 't' command is used to TEST a link. It will issue a TABS level 2 test message to the monitored equipment and wait for a reply. The reply is then verified and you are told if it was good or not. The purpose of this command is to provide a quick check of the link to verify the cables are connected to the terminal bay correctly. If they are not, the command will fail and you should verify your connections and PC port assignments.

d command

The 'd' option will start polling the bay for FL information. The command will ask you to specify a measurement period, usually 60 seconds, over which to collect data. You will also be asked to provide the lowest service channel or line number you wish to report to your screen. This number will only be used in the displaying of the data to establish the first column of

output after the protection channel. The PC will ask the bay for a configuration message, and based on that and your input, ask the bay for data. The sequence of requests is:

1 - Issue an FL sync message
to start a measurement period.
2 - Wait one sync wait period.
3 - Issue an FL sync message.
4 - Wait one sync wait period.
5 - Request FL data from the bay.
6 - Report the FL data collected
over the period.
7 - Wait one user specified poll interval.
8 - Go to Step #3.

You can exit the 'd' command by hitting any key and a RETURN key.

h command

The 'h' option is the same logging option described in the LISTEN mode. This option will send a second copy of your reports to either a printer or a diskette file.

f command

The 'f' option will reset the serial port on the PC. This may have to be done if the PC receiver 'hangs up'. A 'hang up' may be caused by switching from one port to another. The switching may produce noise which will get the PC's receiver stuck and no data is heard by the PC. This should be the first thing you try if you switch TABS links, or reset the bay and start getting error messages out of the PC.

p command

The 'p' command will exit the sub-menu and return you to the MAIN menu. When at the MAIN menu, the PC's transmitter is disabled if you are using an external RS-232 to RS-422 converter. (The RTS lead is turned OFF.) This will allow you to go to LISTEN mode in the MAIN menu directly without turning off the GTP simulation mode.

m command

The 'm' command will cause the PC to display the current sub-menu. After the menu is displayed, you are prompted to select the command you wish to execute.

TBOS SUB-MENU

The TBOS sub-menu contains the same selection options as the TABS AS&C menu. The input options are the same with the exception that you must specify the type of station before the menu appears. This is necessary because TBOS data is valid for the local station only. This also means that at a regenerator station, the hop number on output for the station is "0". The basic TBOS-AS&C sub-menu is shown in Figure 6.

VPM SUB-MENU

The VPM sub-menu is shown in Figure 7. This menu selection is the same as the selection method used in the MAIN menu. If a selection requires more data, you answer the follow-up questions asked by the PC. Each selection is explained below.

t command

The 't' command is used to TEST a link. It will issue a TABS level 2 test message to the monitored equipment and wait for a reply. The reply is then verified and you are told if it was good or not. This command provides a quick check of the link to verify the cables are connected to the terminal bay correctly. If they are not, the command will fail and you should

verify your connections and PC port assignments.

d command

The 'd' option will start polling the bay for FL information. The command will ask you to specify a measurement period, usually 60 seconds, over which to collect data. You will also be asked to provide the lowest service channel or line number you wish to report to your screen. This number will only be used in the displaying of the data to establish the first column of output after the protection channel. The PC will ask the bay for a configuration message, and based on that and your input, ask the bay for data. The sequence of requests is:

1 - Issue a PM sync message
to start a measurement period.
2 - Wait one sync wait period.
3 - Issue a PM sync message.
4 - Wait one sync wait period.
5 - Request PM data from the bay.
6 - Report the PM data collected
over the period.
7 - Wait one user specified poll interval.
8 - Go to Step #3.

You can exit 'd' command by hitting 'q' key and a RETURN key.

h command

The 'h' option is the same logging option described in the LISTEN mode. This option will send a second copy of your reports to either a printer or a diskette file.

f command

The 'f' option will reset the serial port on the PC. This may have to be done if the PC receiver 'hangs up'. A 'hang up' may be caused by switching from one port to another. The switching may produce noise which will get the PC's receiver stuck and no data is heard by the PC. This should be the first thing you try if you switch TABS links, or reset the bay and start getting error messages out of the PC.

p command

The 'p' command will exit the sub-menu and return you to the MAIN menu. When at the MAIN menu, the PC's transmitter is disabled if you are using an external RS-232 to RS-422 converter. (The RTS lead is turned OFF.) This will allow you to go to LISTEN mode in the MAIN menu directly without turning off the GTP simulation mode.

m command

The 'm' command will cause the PC to display the current sub-menu. After the menu is displayed, you are prompted to select the command you wish to execute.

S OPTION

The 's' option should only be used by people very knowledgeable about CB149. This option will expand the length of the sub-menus to include individual TABS message types. The full tabs menu's selections are not explained in this memorandum. The entry into the FULL TABS mode and sub-menu's are shown in Figures 8,9,10,11,12.

Caution: Do not use the 's' option unless you are fully familiar with the operation.

OUTPUT DATA

The PC reports data for Alarms Status and Control, Fault Locating, and Performance Monitoring. The AS&C output consists of a display map and a text string which is output for each display point that changes. The top of the report is a set of lines indicating the bit positions 1 through 64 across the display map. On the left side, the HOP number, display number and bit number are output. The HOP number is the relative station address starting from the local terminal of the station reporting the display data. It is important to note here that any repeater stations equipped with DMR's do not report alarm data, and occupy no station HOP numbers. The output bit map follows next on the same line, where a '.' is used to indicate a bit is off. If you are running with the color option, then a '!' is used to indicate an active alarm. If the '!' is flashing red, the corresponding point is an alarm point. If you attempt to use the MS-DOS print screen key in the color mode, the output may not be what you want. The color option is not recommended for hard copy output.

If you are running with the no color option, the same data is presented but an 'A' or 'S' is used to indicate active alarms or status points.

Following the bit map, a text string may be output which will define the point(s) which has changes since the last output. These text messages are only displayed on change of status.

When setting up the system for output, you must tell the bit map section of the output routine if the output bit map is to contain all the defined displays, or only show the displays with active alarm or status points.

The FL report will display FL data in an array structure. The columns across will be the radio channels, and the lines down will be HOP numbers. The first column will always be the protection line (0), and the remaining columns will be the requested radio channel numbers beginning with the lowest service channel and continuing across the screen until either the maximum number of columns is reached or the highest equipped channel is found. The line output will consist of the HOP number followed by the FL data. The HOPS are numbered with the far end terminal being HOP 0, and then each station in ascending sequence until you reach the local terminal. FL data is collected in the receive direction of transmission on radio channels or lines. On a SERIES-G system, lines are identified by 3 single digits fields quad, line and trib. The FL data consists of five pieces of data appearing as columns under the line or channel number. A '.' under a column indicates the inactive state of the corresponding data item. These columns are labeled "D", "r", "dm", "f", and "ei" where the numbers under the headers are as follows:

D - DMRs are active and switched to this channel.
- DLMs on a SERIES-G system are the quad, line and trib to which the DLM is switched. An '*' in this field on a SERIES-G system is a non DLM ISRM.

f - The station and channel reports were out of frame.

dm - The station and channel have data missing.

r - The RDI bit is set (see CB149).

ei - An estimate of the number of errors at this location. This number is converted to a base 10 number with 1 significant digit of output raised to a power of 10 (e format data item).

If you have the exception option the reports will be the same, but troubles will only be reported on the lines.

The PM report is similar to the FL report except PM data is for the entire switch section in the receive direction. The report is organized in columns of radio channels. The protection channel/line (0) is always reported first followed by the lowest requested service channel up to the maximum number of columns or the highest service channel, whichever comes first. The data is presented in three sections. First the DSP data, then the PSI data, and finally the PSD data. A '.' under a column indicates a 0 or no data for the corresponding data item.

The information in the DSP block is a data missing indicator set if the terminal for some reason could not collect valid PM data. Three types of error seconds are reported. Error seconds type A is a count of the number of seconds in the measurement interval in which one error occurred. Error seconds type B is a count of the number of seconds in the measurement interval in which two or more errors occurred but less than the number required to switch. Error seconds C is a count of the number of seconds in which you were out of frame or had more than the switch threshold number of errors. This block of data also contains a count of the number of out of frame transitions during the period, and the out of frame state at the end of the period. A count of the number of errors that occurred in the measurement interval is also reported.

In the PSI block of data, information on service lines is reported. This information has a data missing field as in the DSP data. This section reports information on service failures and switches. The data reports the channels' NSA (Non Service Affecting) switch transitions count in the period, and the state at the end of the period. The channel's SA (Service Affecting) failure transitions count, and the service failure state at the end of the measurement interval are reported. The PSI data also contains the duration in seconds of both the NSA and SA conditions.

The PSD data is only for the protection line. A data missing indicator is also included. Following the missing indicator data is the data on the protection line. A count of the number of accesses onto or off of protection and the state of protection at the end of the period are reported. Also reported are: a count of the number of access transitions, states during the period and the duration in seconds of these states.

A) gtpsim.exe -f 135fd

54214 GTP_SIMULATION - TABS - VERSION 1.005B
Wed Jul 1 12:39:58 1987

loading "135fd"
loading TERMINAL displays
loading REGEN displays
loading TERMINAL CONTROLS displays
loading REGEN CONTROLS displays
PLEASE enter the COMM port number you are using (1 or 2) Normally a
or '1' or '2' on a AT&T 6300

1
PC parameter settings: LISTENING, COLOR OFF, COMM1 ERROR LOGGING
OFF.
Enter Command:

'l':ENTER LISTEN IN MODE
'g':ENTER/EXIT GTP SIMULATION MODE
'd':DISPLAY DIAGNOSTIC CODE INFORMATION
'!':RUN AN MS-DOS SYSTEM COMMAND
'c':TURN ON/OFF COLOR
'e':TURN ON/OFF ERROR LOGGING
'b':RUN PC LOOPBACK TEST
'q':EXIT GTPSIM PROGRAMT

Figure 1—Menu at Program Startup

```
OPTION?:g
WARNING the GTP must be disconnected in this mode
Please enter a 'l' if this has been done anything else will
abort request l
PC parameter settings: LISTENING, COLOR OFF, COMM1 ERROR LOGGING
OFF.
Enter Command:
        'l':ENTER LISTEN IN MODE
        'g':ENTER/EXIT GTP SIMULATION MODE
        'd':DISPLAY DIAGNOSTIC CODE INFORMATION
        '!':RUN AN MS-DOS SYSTEM COMMAND
        'c':TURN ON/OFF COLOR
        'e':TURN ON/OFF ERROR LOGGING
        'b':RUN PC LOOPBACK TEST
        'q':EXIT GTPSIM PROGRAMT
        't':SELECT TBOS OPTION
        'a':SELECT TABS AS&C OPTION
        'p':SELECT LINE PM OPTION
        'f':SELECT FL OPTION
        'v':SELECT DS3 PM REPORTING OPTION
        's':ENTER/EXIT SPECIAL TABS TESTING MODE
```

Figure 2—Menu When GTP Simulation Active

OPTION?:a
ALARM SURVEILLANCE AND CONTROL
AS&C Output logging is off
Enter command:m press 'm' for the MENU

't': TEST PC DATA LINK
'd': MONITOR AS&C DISPLAY DATA
'o': SEND A REMOTE CONTROL COMMAND
'k': SEND AUTOMATIC REMOTE CONTROL COMMANDS
'h': TURN ON/OFF PRINTER OR DISK LOGGING OF AS&C TEXT MESSAGE
'l': LOAD A NEW AS&C DATABASE
'f': RESET THE TABS LINK
'?': DISPLAY A SINGLE SCAN POINT DEFINITION
'a': DISPLAY ENTIRE SCAN POINT DATABASE
'b': DISPLAY ENTIRE CONTROL POINT DATABASE
'p': RETURN TO THE PRVIOUS MENU
'm': DISPLAY THE AS&C MENU

ALARM SURVEILLANCE AND CONTROL
AS&C Output logging is off
Enter command: press 'm' for the MENU

Figure 3—Basic AS&C SUB Menu

```
OPTION?:p
LINE PERFORMANCE MONITORING
PM Output logging is Off
      Enter command:m                    press 'm' for the MENU


          't': TEST PC DATA LINK
          'd': MONITOR AM DATA
          'h': TURN ON/OFF PRINTER OR DISK LOGGING OF PM
               EXCEPTION REPORT
          'f': RESET THE PC DATA LINK
          'p': RETURN TO THE PREVIOUS MENU
          'm': DISPLAY THE LINE PM MENU
LINE PERFORMANCE MONITORING
PM Output logging os Off
      Enter command:                     press 'm' for the MENU
```

Figure 4—Basic Line Performance Monitoring SUB Menu

```
OPTION?:f
FAULT LOCATING
      Enter command:m                    press 'm' for the MENU

          't': TEST PC DATA LINK
          'd': MONITOR AM DATA
          'h': TURN ON/OFF PRINTER OR DISK LOGGING OF PM
               EXCEPTION REPORT
          'f': RESET THE PC DATA LINK
          'm': DISPLAY THE FL MENU
          'p': RETURN TO THE PREVIOUS MENU
FAULT LOCATING
FL Output logging is off
      Enter Command:                     press 'm' for the MENU
```

Figure 5—Basic Fault Locating SUB Menu

TBOS ALARM SURVEILLANCE AND CONTROL
AS&C Output logging is off
Enter command:m press 'm' for the MENU

'd': MONITOR AS&C DISPLAY DATA
'o': SEND A REMOTE CONTROL COMMAND
'k': SEND AUTOMATIC REMOTE CONTROL COMMANDS
'h': TURN ON/OFF PRINTER OR DISK LOGGING OF AS&C TEXT MESSAGE
'l': LOAD A NEW AS&C DATABASE
'f': RESET THE PC DATA LINK
'?': DISPLAY A SINGLE SCAN POINT DEFINITION
'a': DISPLAY ENTIRE SCAN POINT DATABASE
'b': DISPLAY ENTIRE CONTROL POINT DATABASE
'p': RETURN TO THE PRVIOUS MENU
'm': DISPLAY THE TBOS MENU

AS&C Output logging is off
Enter command: press 'm' for the MENU

Figure 6—Basic TBOS-AS&C SUB Menu

OPTION?:p

DS3 PERFORMANCE MONITORING
VPM Output logging is Off
Enter command:m press 'm' for the MENU

't': TEST PC DATA LINK
'd': MONITOR AM DATA
'h': TURN ON/OFF PRINTER OR DISK LOGGING OF DS3 PM EXCEPTION REPORT
'f': RESET THE PC DATA LINK
'p': RETURN TO THE PREVIOUS MENU
'm': DISPLAY THE LINE DS3 PM MENU

DS3 PERFORMANCE MONITORING
VPM Output logging os Off
Enter command: press 'm' for the MENU

Figure 7—Basic DS3 Performance Monitoring SUB Menu

```
OPTION?:s

Special TABS test menu turned ON
Please enter the TABS level 2 address to monitor
Enter a '0' on RADIO systems
0
PC parameter settings: FULL TABS, multi-point address=0 color Off, com2
logging  Off.
Enter Command:m

        'l':ENTER LISTEN IN MODE
        'g':ENTER/EXIT GTP SIMULATION MODE
        'd':DISPLAY DIAGNOSTIC CODE INFORMATION
        '!':RUN AN MS-DOS SYSTEM COMMAND
        'c':TURN ON/OFF COLOR
        'e':TURN ON/OFF ERROR LOGGING
        'b':RUN PC LOOPBACK TEST
        'q':EXIT GTPSIM PROGRAMT
        't':SELECT TBOS OPTION
        'a':SELECT TABS AS&C OPTION
        'p':SELECT LINE PM OPTION
        'f':SELECT FL OPTION
        'v':SELECT DS3 PM REPORTING OPTION
        's':ENTER/EXIT SPECIAL TABS TESTING MODE
```

Figure 8—Turn On of Special Test Mode

OPTION?:a

ALARM SURVEILLANCE AND CONTROL
AS&C OUTPUT Logging is Off
Enter Command:m

't': TEST DATA LINK
'd': MONITOR ALL Display REQUEST
'o': SEND REMOTE COMMAND
'h': TURN ON/OFF PRNT OR DISK COPY OF AS&C TEXT MESSAGES
'l': LOAD A NEW AS&C DATA BASE
'f': RESET THE PC DATA BASE LINK
'?': DISPLAY A SINGLE SCAN POINT DEFINITION
'a': DISPLAY ENTIRE SCAN POINT DATABASE
'b': DISPLAY ENTIRE CONTROL POINT DATABASE
'p': RETURN TO THE PREVIOUS MENU
'm': DISPLAY THE AS&C MENU
'c': CONFIGURATION REQUEST
'r': RESEND REQUEST
'x': SEND A TABS DIAGNOSTIC REQUEST
'1': CHANGED DISPLAY REQUEST
'2': ALL DISPLAY REQUEST
'3': SEND LONG ADDRESS REMOTE COMMAND
'4': LONG ADDRESS CHANGE DISPLAY REQUEST
'5': LONG ADDRESS ALL DISPLAY REQUEST
'i': INPUT DATA STRING
's': TOGGLE SYSTEM VERIFY

ALARM SURVEILLANCE AND CONTROL
AS&C Output logging is Off
Enter command: press 'm' for the MENU

Figure 9—Full AS&C SUB Menu

LINE PERFORMANCE MONITORING
PM Output logging is Off
Enter command:m press 'm' for the MENU

't': TEST PC DATA LINK
'd': MONITOR AM DATA
'h': TURN ON/OFF PRINTER OR DISK LOGGING OF PM EXCEPTION REPORT
'f': RESET THE PC DATA LINK
'p': RETURN TO THE PREVIOUS MENU
'm': DISPLAY THE PM MENU
'c': CONFIGURATION REQUEST
'r': RESEND REQUEST
'o': ONE MINUTE SYNC
'1': SINGLE LINE DSP
'2': MULTIPLE LINE DSP
'3': SINGLE LINE PSI
'4': MULTIPLE LINE PSI
'5': SINGLE LINE PSD
'6': MULTIPLE LINE PSD
'7': LONG ADDRESS SINGLE LINE DSP
'8': LONG ADDRESS MULTIPLE LINE DSP
'9': LONG ADDRESS SINGLE LINE PSI
'x': LONG ADDRESS MULTIPLE LINE PSI
'y': LONG ADDRESS SINGLE LINE PSD
'z': LONG ADDRESS MULTIPLE LINE PSD
'i': INPUT DATA STRING

LINE PERFORMANCE MONITORING
PM Output logging is Off
Enter command: press 'm' for the MENU

Figure 10—Full Line Performance Monitoring SUB Menu

```
FAULT LOCATING
FL Output logging is Off
Enter Command:m                    press 'm' for the MENU

        't': TEST PC DATA LINK
        'd': MONITOR FL DATA
        'h': TURN ON/OFF PRNT OR DISK LOGGING OF FL EXCEPTION REPORTING
        'f': RESET THE PC DATA LINK
        'm': DISPLAY THE FL MENU
        'p': RETURN TO THE PREVIOUS MENU
        'c': CONFIGURATION REQUEST
        'r': RESEND REQUEST
        'o': ONE MINUTE SYNC
        '1': SINGLE REGEN AUTO FL
        '2': MULTIPLE REGEN AUTO FL
        '3': MULTIPLE LINE AUTO FL
        '4': DMR SWITCH REQUEST MESSAGE
        'a': DLM SINGLE REGEN AUTO FL
        'e': DLM MULTIPLE REGEN AUTO FL
        'g': DLM MULTIPLE LINE AUTO FL
        's': ENABLE/DISABLE OPTION FOR DEMAND REQUESTS
        'i': INPUT DATA STRING
FAULT LOCATING
FL Output logging is Off
    enter command:                 press 'm' for the MENU
```

Figure 11—Full Fault Locating SUB Menu

DS3 PERFORMANCE MONITORING
VPM Output logging is Off
Enter command:m press 'm' for the MENU

't': TEST PC DATA LINK
'd': MONITOR DS3 PM DATA
'h': TURN ON/OFF PRINTER OR DISK LOGGING OF DS3 PM EXCEPTION REPORT
'f': RESET THE PC DATA LINK
'p': RETURN TO THE PREVIOUS MENU
'm': DISPLAY THE LINE PM MENU
'c': CONFIGURATION REQUEST
'r': RESEND REQUEST
'o': ONE MINUTE SYNC
'1': SINGLE LINE DSP
'2': MULTIPLE LINE DSP
'3': SINGLE LINE PSI
'4': MULTIPLE LINE PSI
'5': SINGLE LINE PSD
'6': MULTIPLE LINE PSD
'7': LONG ADDRESS SINGLE LINE DSP
'8': LONG ADDRESS MULTIPLE LINE DSP
'9': LONG ADDRESS SINGLE LINE PSI
'x': LONG ADDRESS MULTIPLE LINE PSI
'y': LONG ADDRESS SINGLE LINE PSD
'z': LONG ADDRESS MULTIPLE LINE PSD
'i': INPUT DATA STRING

DS3 PERFORMANCE MONITORING
VPM Output logging is Off
Enter command: press 'm' for the MENU

Figure 12—Full DS3 Performance Monitoring SUB Menu

APPENDIX A--DATA BASE DESCRIPTION

BUILDING A DATA BASE

The data base is divided into six parts. Each of the six parts is explained in the following sections.

N AND M

The first line in the file must contain two numbers N,M where N is the number of terminal displays, and M is the number of regenerator displays. These numbers are used in loading the data described below, and in determining the HOP numbers. If the display of interest is greater than N, the display is for a regenerator. For those interested, HOP numbers and local display numbers are computed as follows.

- The generator site or HOP numbers is computed by subtracting N from the display of interest, and dividing the result by the number of regenerator displays.
- The local regenerator display number is determined by subtracting N from the display of interest and taking that result modulus M.

COMMENT LINES

Input lines 2 through 5 are comment lines available to you to place a header on your data base. In the growth of the program, the first line of the comments was used to set program flags to indicate the presence of a "dummy" data base" or a SERIES-G system. These were necessary to support comment the unique addressing used in SERIES-G systems, and to allow for a dummy data base to support other vendor systems.

If the second comment line contains a 'xxx dummy up" line, the program will set a flag to indicate that no AS&C text string is to be output on the reports. If the second line contains a "xxx series g", the program will configure itself to handle the long addressing required by a SERIES-G system, and change the output reporting format to that of a SERIES-G system. Finally, if the second line contains a "xxx series g - tma", the program will set itself into a mode that expects to talk to a SERIES-G TMA AS&C link.

TERMINAL SCAN POINTS

On the 6th line of input there must be the line "terminal scan points". Starting on the 7th line of input, and continuing on until an input line ending with a '.' are the definitions of TERMINAL scan points. Each line is input in the following format. Starting in column is the display number followed by a ':'. Next is the point number followed by a ':'. The definition of the point as an alarm or status point is next. This is done by entering an 'A' for an alarm or an 'S' for a status point. This letter is then followed by a ':'. The last information on the input line is text for the point. This text has a maximum of 35 characters.

REGENERATOR SCAN POINTS

Beginning on the line following the last terminal scan point indicated by an input line ending with a '.', the string "regenerator scan points" must be entered. The data following this is the same as that for the terminal scan points. The last point must end with a '.'.

TERMINAL CONTROL POINTS

On the next line following the last regenerator scan point, must be "terminal control points". The data following this line is in the same format as the scan points except the 'A' or 'B' field is omitted. This block must have a '.' as the last character on the last point.

REGENERATOR CONTROL POINTS

Following the terminal control points, you must have a line that has "regenerator control points". The remaining lines up to a point ending with a '.' will be loaded as the text for regenerator control points.

EXAMPLE OF DATA BASE

The following is an example of GTPSIM data base structure to aid your understanding:

4 4
ter disp #regen disp
64QAM DIGITAL RADIO (135)
TERMINAL STATION 135A
STATION SCAN POINTS and CONTROL POINTS

terminal scan points
1:1:A:TERM control system alarm
1:2:A:TERM fan fail
1:3:A:TERM switch signaling fail
1:4:A:TERM power fail
1:9:A:TMTG rail A incoming fail
1:10:A:TMTG rail B incoming fail
1:11:A:TMTG rail C incoming fail
1:12:A:TMTG radio auto switch alarm
1:13:A:TMTG radio switch lockup
1:14:A:TMTG previous section fail
1:17:A:TMTG REG digital fail
1:18:A:TMTG REG radio fail
1:19:A:TMTG REG radio twt wearout
1:21:A:TMTG PROT digital fail
1:22:A:TMTG PROT radio fail
1:23:A:TMTG PROT radio twt wearout
1:25:A:RCVG rail A service alarm
1:26:A:RCVG rail B service alarm
1:27:A:RCVG rail C service alarm
1:28:A:RCVG receive switch fail
1:29:A:RCVG radio rf preamp fail
1:30:A:RCVG prot auto switch alarm
1:33:A:RCVG REG radio fail
1:34:A:RCVG REG digital fail
1:35:A:RCVG REG performance alarm
1:36:A:RCVG REG switch section prfrmc
1:37:A:RCVG REG switch section fail
1:41:A:RCVG PROT radio fail
1:42:A:RCVG PROT digital fail
1:43:A:RCVG PROT performance alarm
1:44:A:RCVG PROT switch section prfrmc
1:45:A:RCVG PROT switch section fail
2:1:S:TMTG radio switch
2:2:S:TMTG radio manual switch
2:3:S:TMTG radio manual lockout
2:9:S:RCVG receive switch
2:10:S:RCVG receive manual switch
2:11:S:RCVG rtx switch
2:12:S:RCVG rtx manual switch
2:13:S:RCVG manual lockout
2:17:S:RCVG REG prfrmc error rate
2:18:S:RCVG REG prfrmc intermittent

2:19:S:RCVG REG prfrmc test active
2:21:S:RCVG PROT prfrmc error rate
2:22:S:RCVG PROT prfrmc intermittent
2:23:S:RCVG PROT prfrmc test active
2:25:S:TERM order-wire off-hook
2:26:S:TMTG REG downstream prfrmc fail
2:33:S:TMTG stat REG misframe
2:34:S:TMTG stat REG high error rate
2:35:S:TMTG stat REG low error rate
2:37:S:TMTG stat PROT misframe
2:38:S:TMTG stat PROT high error rate
2:39:S:TMTG stat PROT low error rate
3:1:A:USER alarm point #1
3:2:A:USER alarm point #2
3:3:A:USER alarm point #3
3:4:A:USER alarm point #4
3:5:A:USER alarm point #5
3:6:A:USER alarm point #6
3:7:A:USER alarm point #7
3:8:A:USER alarm point #8
3:9:A:USER alarm point #9
3:10:A:USER alarm point #10
3:11:A:USER alarm point #11
3:12:A:USER alarm point #12
3:13:A:USER alarm point #13
3:14:A:USER alarm point #14
3:15:A:USER alarm point #15
3:16:A:USER alarm point #16
3:17:A:USER alarm point #17
3:18:A:USER alarm point #18
3:19:A:USER alarm point #19
3:20:A:USER alarm point #20
3:21:A:USER alarm point #21
3:22:A:USER alarm point #22
3:23:A:USER alarm point #23
3:24:A:USER alarm point #24
3:33:S:USER status point #1
3:34:S:USER status point #2
3:35:S:USER status point #3
3:36:S:USER status point #4
3:37:S:USER status point #5
3:38:S:USER status point #6
3:39:S:USER status point #7
3:40:S:USER status point #8
4:1:S:master + alarm
4:2:S:terminal status
4:4:S:user interface
4:5:S:terminal controller
4:9:S:alignment unit
4:10:S:receive switch

4:11:S:transmit switch cntrl
4:12:S:chan contr REG
4:13:S:chan contr PROT
4:14:S:serv chan muldem
4:15:S:VMR & coder.
regenerator scan points
1:1:A:REGEN control system alarm
1:2:A:REGEN fan fail
1:3:A:REGEN AC switch signaling fail
1:4:A:REGEN BD switch signaling fail
1:5:A:REGEN power fail
1:9:A:RCVG AC radio rf preamp fail
1:10:A:RCVG AC receive switch fail
1:11:A:RCVG AC prot auto switch alarm
1:12:A:TMTG AC radio auto switch alarm
1:13:A:TMTG AC radio switch lockup
1:17:A:RCVG REG AC radio fail
1:18:A:RCVG REG AC digital fail
1:19:A:RCVG REG AC performance alarm
1:21:A:TMTG REG AC digital fail
1:22:A:TMTG REG AC radio fail
1:23:A:TMTG REG AC twt wearout
1:25:A:RCVG PROT AC radio fail
1:26:A:RCVG PROT AC digital fail
1:27:A:RCVG PROT AC performance alarm
1:29:A:TMTG PROT AC digital fail
1:30:A:TMTG PROT AC radio fail
1:31:A:TMTG PROT AC twt wearout
1:33:A:RCVG BD radio rf preamp fail
1:34:A:RCVG BD receive switch fail
1:35:A:RCVG BD prot auto switch alarm
1:36:A:TMTG BD radio auto switch alarm
1:37:A:TMTG BD radio switch lockup
1:41:A:RCVG REG BD radio fail
1:42:A:RCVG REG BD digital fail
1:43:A:RCVG REG BD performance alarm
1:45:A:TMTG REG BD digital fail
1:46:A:TMTG REG BD radio fail
1:47:A:TMTG REG BD twt wearout
1:49:A:RCVG PROT BD radio fail
1:50:A:RCVG PROT BD digital fail
1:51:A:RCVG PROT BD performance alarm
1:53:A:TMTG PROT BD digital fail
1:54:A:TMTG PROT BD radio fail
1:55:A:TMTG PROT BD twt wearout
2:1:S:RCVG REG AC prfrmc error rate
2:2:S:RCVG REG AC prfrmc intermittent
2:3:S:RCVG REG AC prfrmc test active
2:5:S:RCVG PROT AC prfrmc error rate
2:6:S:RCVG PROT AC prfrmc intermittent

2:7:S:RCVG PROT AC prfrmc test active
2:9:S:RCVG AC receive switch
2:10:S:RCVG AC receive manual switch
2:12:S:RCVG/TMTG AC manual lockout
2:14:S:TMTG AC radio switch
2:15:S:TMTG AC radio manual switch
2:17:S:RCVG REG BD prfrmc error rate
2:18:S:RCVG REG BD prfrmc intermittent
2:19:S:RCVG REG BD prfrmc test active
2:21:S:RCVG PROT BD prfrmc error rate
2:22:S:RCVG PROT BD prfrmc intermittent
2:23:S:RCVG PROT BD prfrmc test active
2:25:S:RCVG BD receive switch
2:26:S:RCVG BD receive manual switch
2:28:S:RCVG/TMTG BD manual lockout
2:30:S:TMTG BD radio switch
2:31:S:TMTG BD radio manual switch
2:34:S:TMTG AC downstream prfmc fail
2:35:S:TMTG BD downstream prfmc fail
2:41:S:TMTG stat REG AC misframe
2:42:S:TMTG stat REG AC high error rate
2:43:S:TMTG stat REG AC low error rate
2:45:S:TMTG stat PROT AC misframe
2:46:S:TMTG stat PROT AC high error rate
2:47:S:TMTG stat PROT AC low error rate
2:49:S:TMTG stat REG BD misframe
2:50:S:TMTG stat REG BD high error rate
2:51:S:TMTG stat REG BD low error rate
2:53:S:TMTG stat PROT BD AC misframe
2:54:S:TMTG stat PROT BD high error rate
2:55:S:TMTG stat PROT BD low error rate
3:1:A:user alarm point #1
3:2:A:user alarm point #2
3:3:A:user alarm point #3
3:4:A:user alarm point #4
3:5:A:user alarm point #5
3:6:A:user alarm point #6
3:7:A:user alarm point #7
3:8:A:user alarm point #8
3:9:A:user alarm point #9
3:10:A:user alarm point #10
3:11:A:user alarm point #11
3:12:A:user alarm point #12
3:13:A:user alarm point #13
3:14:A:user alarm point #14
3:15:A:user alarm point #15
3:16:A:user alarm point #16
3:17:A:user alarm point #17
3:18:A:user alarm point #18
3:19:A:user alarm point #19

3:20:A:user alarm point #20
3:21:A:user alarm point #21
3:22:A:user alarm point #22
3:23:A:user alarm point #23
3:24:A:user alarm point #24
3:33:S:user status point #1
3:34:S:user status point #2
3:35:S:user status point #3
3:36:S:user status point #4
3:37:S:user status point #5
3:38:S:user status point #6
3:39:S:user status point #7
3:40:S:user status point #8
4:1:S:master + alarm
4:2:S:REGEN AC status
4:3:S:REGEN BD status
4:4:S:user interface
4:5:S:RGEN controller
4:9:S:alignment unit AC
4:10:S:receive switch AC
4:11:S:transmit switch ctrl AC
4:12:S:chan contr regular AC
4:13:S:chan contr PROT AC
4:14:S:muldem AC
4:17:S:alignment unit BD
4:18:S:receive switch BD
4:19:S:transmit switch ctrl BD
4:20:S:chan contr regular BD
4:21:S:chan contr PROT BD
4:22:S:muldem BD.

terminal control points
1:1:TMTG radio manual switch
1:2:TMTG radio manual lockout
1:3:TMTG radio manual reset
1:4:RCVG receive manual switch
1:5:RCVG rtx manual switch
1:6:RCVG manual lockout
1:7:RCVG manual reset
1:8:RCVG performance test
1:9:TERM control system alarm reset
3:1:USER control operate #1
3:2:USER control release #1
3:3:USER control operate #2
3:4:USER control release #2
3:5:USER control operate #3
3:6:USER control release #3
3:7:USER control operate #4
3:8:USER control release #4.

regenerator control points
1:1:RCVG AC manual reset

1:2:RCVG AC performance test
1:3:RCVG AC receive manual switch
1:5:RCVG/TMTG AC manual lockout
1:7:TMTG AC radio manual switch
1:8:TMTG AC radio manual reset
1:9:RCVG BD manual reset
1:10:RCVG BD performance test
1:11:RCVG BD receive manual switch
1:13:RCVG/TMTG BD manual lockout
1:15:TMTG BD radio manual switch
1:16:TMTG BD radio manual reset
1:17:REGEN control system alarm reset
3:1:user control operate #1
3:2:user control release #1
3:3:user control operate #2
3:4:user control release #2
3:5:user control operate #3
3:6:user control release #3
3:7:user control operate #4
3:8:user control release #4.

BUILDING AN AUTOMATIC CONTROLS DATA BASE

The program will allow you to supply an input file that will be loaded into the PC's memory. There will be one line for each control point to be set up to a maximum of 16. The input file will start with the number of entries to follow. On the second line, you will have the words "time data" or "relay data" to differentiate between time based controls, and logic based controls. The third line is a comment line in the input file. Starting on the fourth line the control points are defined. There is very little error checking of this data so be careful when inputting data.

A time based control point will be asserted based on the nearest poll after the specified time has elapsed. Time based controls also allow you to assert a point once at the start of the "k" command or every PC poll. The format for a time based controls set is as follows:

time, hop, display, point

where time is the number of seconds between the setting of the points, or a -1 if the point is to be set only at the start of a "k" command, or a zero (0) if the control is to be set on each poll for data by the "k" command

The hop is the relative hop number from this end of the system in TABS systems, or a 0 in a TBOS systems.

The display number is next. The display numbers start at 1 for all station types.

The point number is last starting from 1 through 63.

An example of a time based automatic controls file is shown below. In this case, local station display 1 point 2 are asserted on start of the "k" command, and points 9, 8, and 2 are asserted every poll, every 20 seconds, and every 20 seconds.

```
4
time data
del-t    hop    dsp    pnt
-1       0      1      2
0        0      1      9
30       0      1      8
20       0      1      2
```

A logic based control point will be set based on the state of other AS&C display bits. The control point will be asserted if the logical expression is "TRUE." Each of the specified input points to be asserted will consist of three parts. The HOP to send the remote control, the local display number, and the point in that display is set. Next the conditioning points are specified. Each of these points will consist of four parts: the HOP, display, point, and operator. The operator will be either a "|" or a "&". There are, for a logical expression, "or" and "and". The last entry for an output control point is a ";" to signify the end of a control point list, or a "." to end the data to be loaded. The ";" or "." must be the next character following the operator. Finally of interest, if a point is specified as "-n", your expression is true if the specified point is "off."

In the following example, remote controls at the local station will be set if the Alarm and Status bits are in the correct state. In this example, local display 1 point 3 will be set if local display 2 point 3 is set. Control bit 3 in display 1 will also be set if display 2 point 3 is set, or display 2

point 2 is set. The third remote control (display 3 point 1) will be set if display 1 bit 14 is set. The fourth remote control will be set (display 1 bit 8) if display 2 bit 19 is "off." The fifth control (display 3 point 2) will be set if display 1 bit 35 is set. The "." at the end is the end of the points to be loaded.

```
5
relay data
chop    odsip   obit    hop     dsp     pnt     opr
0       1       3       0       2       3       !;
0       1       3       0       2       3       ! 0 2 2 !;
0       3       1       0       1       14      !;
0       1       8       0       2       -19     !;
0       3       2       0       1       35      !.
```

APPENDIX B--MISCELLANEOUS INFORMATION

CONNECTIONS TO A RADIO SYSTEM

This section contains information on how to connect your PC to a terminal bay for either a 135 frequency diversity or a 90C radio system. This section also contains information to assist you in setting up a system that will enable you to broadcast the telemetry data to all the stations over a service channel. A special 210b board (with the RS-422 terminating resistor removed) placed in the terminal(s) is required for this purpose. At the regenerator or far end terminal you can use another 210b to receive the corresponding data.

The information provided below should help in making connections to a radio system.

GTP CONNECTIONS to a 135FD or 90C Radio system

THE BAY AS&C TRANSMIT	on terminal block TSA	+C4	-C5
THE BAY AS&C RECEIVE	on terminal block TSA	+C1	-C2
THE BAY PM TRANSMIT	on terminal block TSA	+D4	-D5
THE BAY PM RECEIVE	on terminal block TSA	+D7	-D8
THE BAY FL TRANSMIT	on terminal block TSA	+C7	-C8
THE BAY FL RECEIVE	on terminal block TSA	+D1	-D2

Terminal Service Channel Access

At a TERMINAL to broadcast data use service channel w, x, or y. Connect jumpers from Normal GTP connections on TSA to Service channel access on TSC. You need 6 jumpers from the TSA block to TSC block which should be about 15 inches long.

GTP replies - TSA		Service channel access - TSC			
Link		W	X	Y	Z
	+ / -	+ / -	+ / -	+ / -	Not usable
ASC	C4/C5 Sub channel 1	B5/B6	E1/E2	G3/G4	
PM	D4/D5 Sub channel 2	B7/B8	E3/E4	G5/G6	
FL	C7/C8 Sub channel 3	B9/B10	D7/D8	F9/F10	
VPM	----- Sub channel 4	C1/C2	D9/D10	G1/G2	

At the receive TERMINAL to access broadcast messages from the other end, you need to attach your PC to Service channels at the following pins on TSC.

		Service channel access - TSC			
Link		W	X	Y	Z
		+ / -	+ / -	+ / -	Not usable
ASC	Sub channel 1	A3/A4	C5/C6	E7/E8	
PM	Sub channel 2	A7/A8	C7/C8	E9/E10	
FL	Sub channel 3	A9/A10	C9/C10	F1/F2	
VPM	Sub channel 4	B1/B2	D1/D2	F3/F4	

Regenerator Service Channel Access

At a Regenerator to access data broadcast over service channels, you must make the following connections for the service channels used to broadcast data from the terminals.

W service channel - A direction
Set dice straps on TSE to connect C3, C4, C5, and C6 to D5.
- B direction
Set dice straps on TSE to connect F3, F4, F5, and F6 to D5.

X service channel - A direction
Set dice straps on TSA to connect C3, C4, C5, and C6 to D5.
- B direction
Set dice straps on TSA to connect F3, F4, F5, and F6 to D5.

Y service channel - A direction
Set dice straps on TSB to connect C3, C4, C5, and C6 to D5.
- B direction
Set dice straps on TSB to connect F3, F4, F5, and F6 to D5.

Connect the PC to pins on the proper terminal block at the top of the bay to listen in on data being sent to the GTP.

Service channel access

A direction (listen in on A terminal's GTP data)

Link		W	X	Y	Z
	terminal block	TSE	TSA	TSB	
		+ / -	+ / -	+ / -	Not usable
ASC	Sub channel 1	B1/B2	B1/B2	B1/B2	
PM	Sub channel 2	B3/B4	B3/B4	B3/B4	
FL	Sub channel 3	B5/B6	B5/B6	B5/B6	
VPM	Sub channel 4	B7/B8	B7/B8	B7/B8	

B direction (listen in on B terminal's GTP data)

Link		W	X	Y	Z
	terminal block	TSE	TSA	TSB	
		+ / -	+ / -	+ / -	Not usable
ASC	Sub channel 1	E1/E2	E1/E2	E1/E2	
PM	Sub channel 2	E3/E4	E3/E4	E3/E4	
FL	Sub channel 3	E5/E6	E5/E6	E5/E6	
VPM	Sub channel 4	E7/E8	E7/E8	E7/E8	

Cables and Connections

The cables and connections needed to allow the GTPSIM program to run with the AT&T PC 6300 are shown in Figure 13. In this figure, a fully populated 25-Pin RS-232 cable connects the PC 6300 and the RS-232C to RS-485 Converter (485 power supply unit). The 25-Pin female is connected to the serial port 1 on the PC 6300 and the 25-Pin male is connected to the RS-232 side of the power supply unit. ***Pins 5,6,8 and 20 of the RS-232/25-Pin female (on the power supply unit) must be connected or jumpered together.*** A 25-Pin female end of a cable is connected to the RS-485 side of the power supply. The pin connections are as indicated in Figure 13. The other end of this cable is connected to the monitored equipment.

With a minor change, the illustration in Figure 13 is used to run GTPSIM program on a portable PC. The fully populated 25-Pin RS-232 cable is replaced with a 9-Pin female to 25-Pin/RS-232 cable. The 9-Pin female is connected to the portable PC. Pins 5,6,8 and 20 are tied and connected to the RS-232 side of the power supply unit.

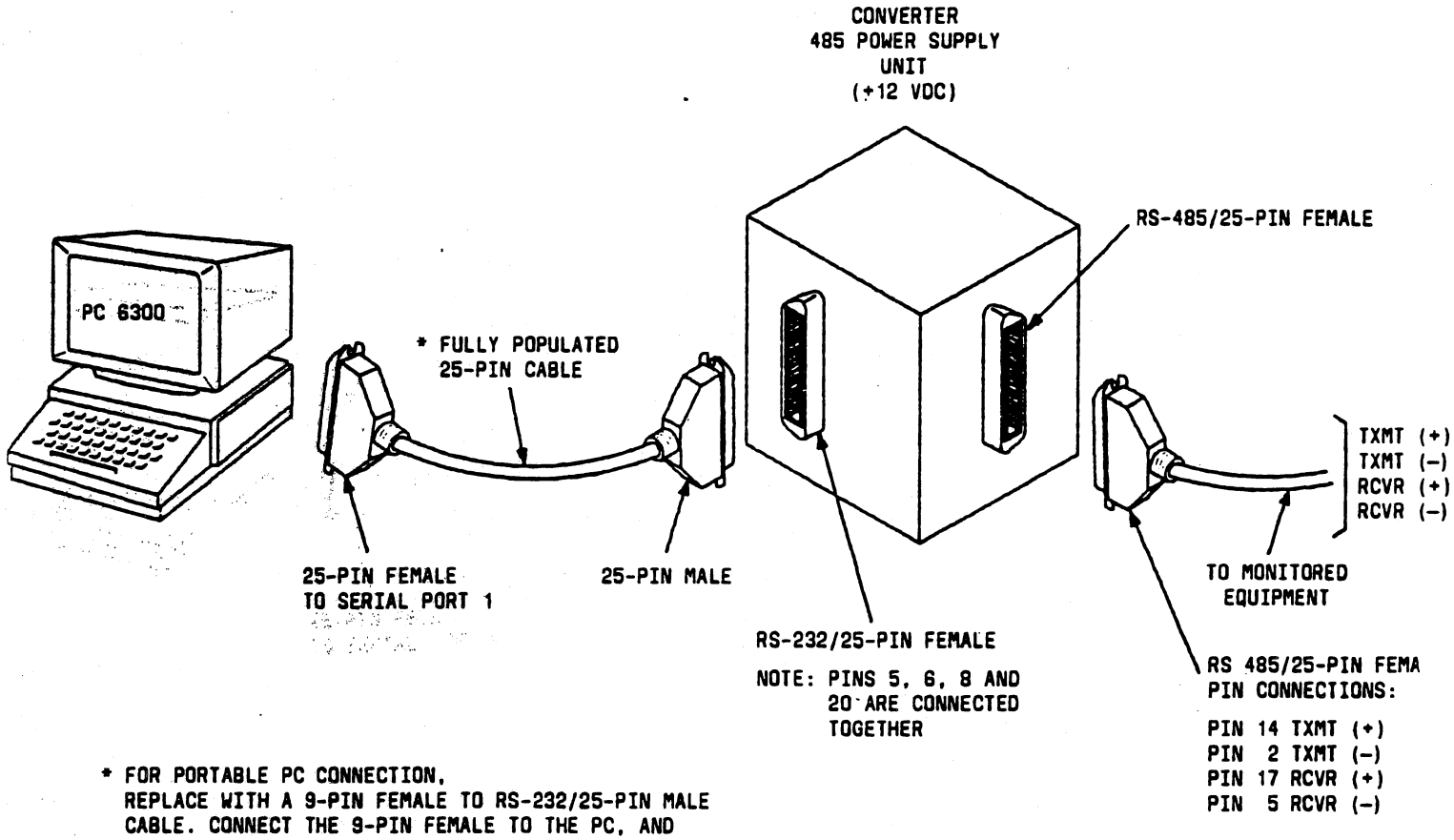
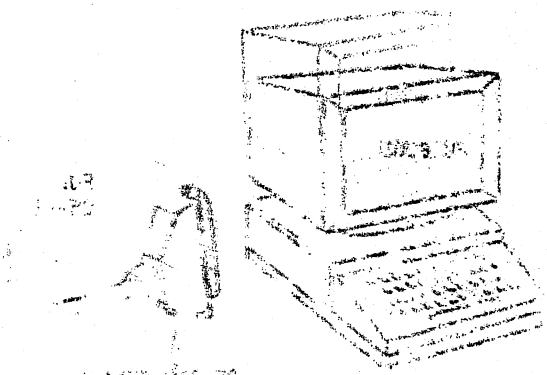


Figure 13—Connections To Personnal Computer (AT&T PC 6300)



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