Configuration Manual

EDACS® Site Downlink & CEC/IMC Uplink GETC™

ERICSSON

NOTICE!

This manual covers Ericsson and General Electric products manufactured and sold by Ericsson Inc.

NOTICE!

Repairs to this equipment should be made only by an authorized service technician or facility designated by the supplier. Any repairs, alterations or substitution of recommended parts made by the user to this equipment not approved by the manufacturer could void the user's authority to operate the equipment in addition to the manufacturer's warranty.

NOTICE!

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

This manual provides instructions for configuring the Ericsson **GE T**runking **C**ard Shelf (GETC™), part number 19D901868G3, for Site Downlink and CEC/IMC Uplink operation. It is applicable to GETC hardware platforms installed in wideband or narrow band **E**nhanced **D**igital **A**ccess **C**ommunication **S**ystems (EDACS®).

The Downlink and Uplink work together to provide a digital communication path between an EDACS site(s) and the **C**onsole **E**lectronics **C**ontroller (CEC) or the **I**ntegrated **M**ultisite and Console **C**ontroller (IMC). This manual provides instructions for reconfiguring the standard GETC for Downlink or Uplink operation and explains the Downlink and Uplink function and interaction.

The Downlink GETC uses a standard GETC 1e (Lightning GETC + Turbo Board) and modem with a special interface cable and harness. The Uplink GETC is similar except it does not have a Turbo Board. The following is a list of installed subassemblies:

- Logic Board 19D904266G1.
- GETC Expansion Module, GETC 1e (Turbo Board) 19D903536P1. (Downlink only.)
- Regulator Board 19C366861G2.
- Rockwell Modem 19A705178P1.

This manual includes the GETC configuration information used with the latest Link software. However, most of the information in this manual also pertains to GETC configurations with earlier software.

DESCRIPTION

The Downlink and Uplink are unique applications of a GETC shelf that function as modems providing a serial control link between the EDACS sites and the CEC/IMC. The link operates at 9600 baud full duplex over four wire standard data grade (type 3002) phone lines. The serial data link carries information representing, but not limited to, radio identification, polling messages, keying messages, and channel assignments.

The Site Controller uses a multitasking computer running **Ericsson Inc**. application software. It provides moment to moment trunking features such as channel assignments, call validation, unit enable/disable, dynamic regrouping, and queuing management. The Site's Downlink GETC exchanges a variety of system messages with the CEC/IMC's Uplink GETC. The CEC/IMC is a multi-point switch with a distributed computer architecture. It is the hub for multi-site activity, and as such, requires intimate communication via the GETC links with all connected sites.

FAULT TOLERANCE

Both the Downlink and Uplink GETCs are part of a fault tolerant design philosophy that permits a system to continue operating even if there is a major component failure. Figure 1 shows two fault tolerant elements. The Downlinks and Uplinks form a redundant data path between the System and the CEC/IMC. Additionally, the Downlink supports both a Main Serial Link (MSL) and a Failsoft Backup Serial Link (BSL).

The Failsoft mode allows the system to continue trunked operation, with a reduced feature set, in the case of a Site Controller failure. The Downlink and Uplink are powerful enough to continue normal operations without the Site Controller.

SOFTWARE REQUIREMENTS

The Downlink and Uplink GETCs both employ the same link software. The Downlink, because of its requirement for a GETC 1e platform, has additional software and personality requirements. Table 1 lists the recommended software combinations that involve the Downlink and the Downlink's corresponding Station GETCs.

NOTE

Refer to the Link Software Release Notes SRN1061 for Link software versions later than 344A4895G1 and the compatibility of this software with the software used in other EDACS equipment.

Table 1 - Software Combinations

Downlink and Uplink Recommended Software Combinations	
Wideband Applications	
*Downlink GETC, Use Software 344A4895G4 or Later.	*Turbo Board is Required, Use Software 350A1121G4.
Downlink GETC, Use Software 344A4895G1.	Turbo Board is Required, Use Software 344A4414G3.
Downlink GETC, Use Software 19A149256G18 or Later.	Turbo Board is Optional, Use Software 344A4414G1.
Uplink GETC, Use the same software specified for the corresponding Downlink GETC.	Turbo Board is Unused.

Table 1- Software Combinations (continued)

Narrow Band Applications	
*Downlink GETC, Use Software 344A4895G4 or Later.	*Turbo Board is Required, Use Software 350A1121G4.
Downlink GETC, Use Software 344A4895G1.	Turbo Board is Required, Use Software 344A4414G3.
Downlink GETC, Use Software 19A705595G8 or Later.	Turbo Board is Optional, Use Software 344A4414G1.
Uplink GETC, Use the same software specified for the corresponding Downlink GETC.	Turbo Board is Unused.
* = Recommended Configuration	

RELATED PUBLICATIONS

It may be necessary to consult one or more of the following documents during the installation process. These manuals will also provide additional guidance if you encounter technical difficulties during the configuration process.

LBI-33031 - Rockwell Modem Model R96FT (19A705178) Maintenance Manual.

LBI-38430 - MASTR IIe Control Shelf Maintenance Manual.

LBI-38636 - MASTR III Base Station Installation Manual.

LBI-38662 - EDACS CEC/IMC Maintenance Manual.

LBI-38812 - EDACS Interface Panel Maintenance Manual.

LBI-38822 - Turbo Board (GETC 1e) Maintenance Manual.

LBI-38894 - GETC Trunking Card Maintenance Manual.

LBI-38985 - EDACS Site Controller Maintenance Manual.

LBI-38988 - EDACS Station GETC Configuration Manual.

SRN-1010 - Software Release Notes for GETC Turbo Board Software, 344A4414G1 only.

SRN-1061 - Software Release Notes for Link Software, 344A4895G1 (or later) and Link Turbo Software 350A1121G4 (or later).

SRN-1062 - Software Release Notes for Turbo Board with GETC 1e Software, 344A4414G2 (or later).

TQ-3357 - GETC Shelf Programming Manual

OPERATION

The Downlink and Uplink work together to provide a serial communication path between the CEC/IMC and the Site Controller. The two Link GETCs communicate synchronously at 9600 baud using the Rockwell Modem and 600 ohm data-grade (type 3002) phone lines or equivalent. The transferred data represents channel assignments, ID information, polling messages, and keying messages. The GETC stores the messages in a FIFO queue and processes them for transmission.

Figure 1 shows a full featured trunked system using the Downlink's J100 Main Serial Link (MSL). During the Failsoft trunking mode, the Backup Serial Link (BSL) connects the Downlink's J102 to the Site's Repeater GETCs. The GETCs communicate asychronously on the MSL and BSL at 19.2K baud. Message bytes are made up of 8 data bits, 1 stop bit, and no parity bit.

The Uplink extends the serial path to the CEC/IMC through the MASTR II/III Interface Module or MIM. The MIM serial connection to J100 of the Uplink is also an asynchronous 19.2K baud data stream. Message bytes are made up of 8 data bits, 1 stop bit, and no parity bit. The MIM is a microprocessor based Controller Board which controls up to five Audio Boards for a 20 channel system. An optional configuration includes a Standby Downlink matched with a corresponding Standby Uplink and Controller Board for redundant operation.

The Downlink and Uplink use an **Ericsson Inc**. proprietary protocol to form message based digital data in support of various trunking functions. The digital data messages represent channel requests from the CEC/IMC, channel assignments from the Site Controller, patch and Simulselect information, Failsoft indications, and user radio login during roaming.

CHANNEL ASSIGNMENTS

When an EDACS mobile or portable radio is turned on, its receiver scans the channels of the system looking for the Control Channel which is sending a message every 30 milliseconds. The radio decodes and synchronizes itself to with this periodic control message. When the radio is synchronized with the Control Channel, it is ready to place or receive trunked calls.

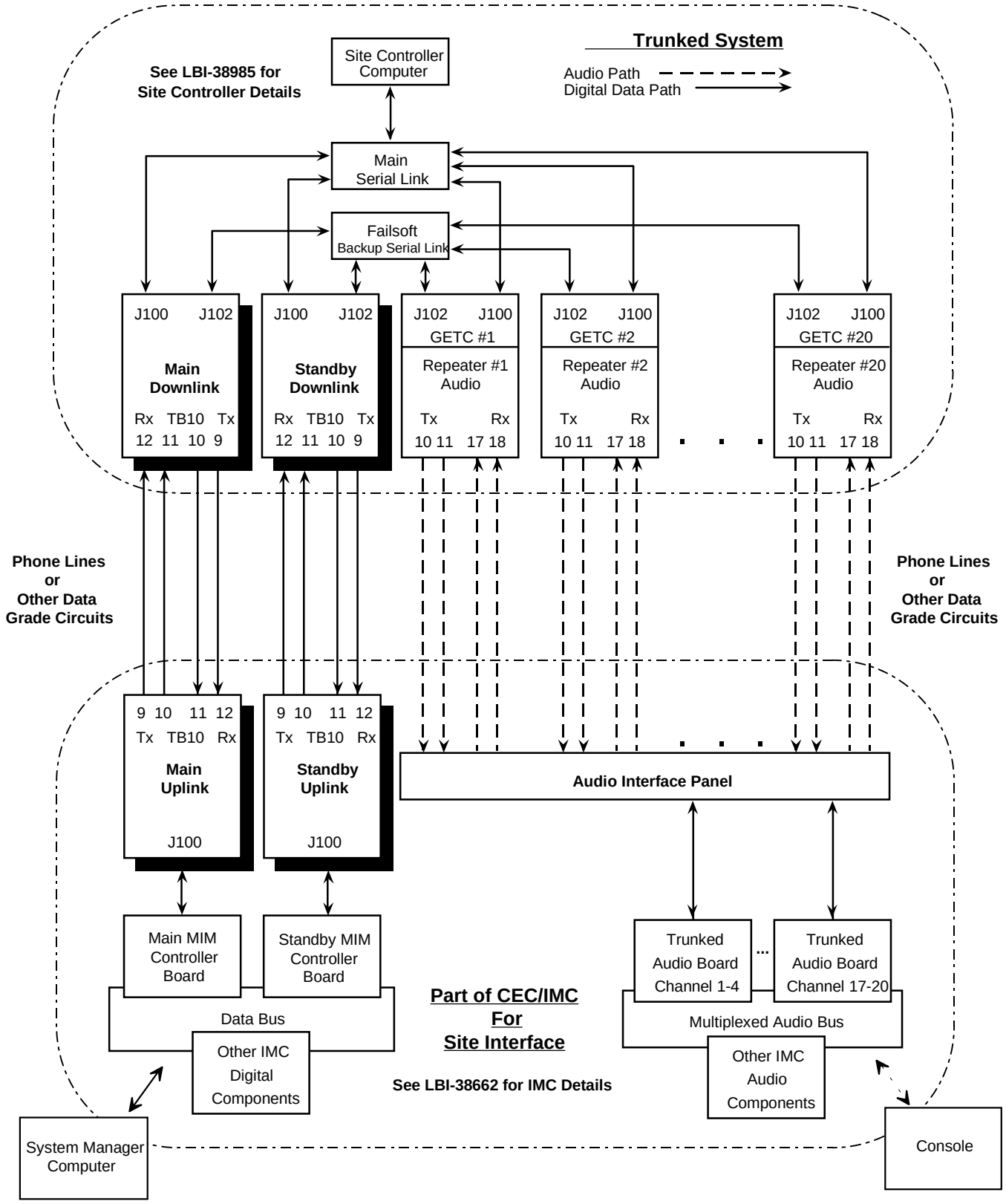


Figure 1 - Downlink and the CEC/IMC's Uplink for a Single Site Trunked System

When a Site Controller is present, the key steps within an EDACS network during an unconfirmed channel assignment process are:

- The user presses a mobile or portable's Push to Talk (PTT) switch. The radio transmits a channel request message on the Control Channel .
- The Control Channel GETC receives the channel request from the calling radio, translates it into Controller protocol, and sends a call/channel request message to the Site Controller
- The Site Controller receives the channel request from the Control Channel GETC and validates the Unit ID and Group ID.
- If the call request is permitted, the Site Controller checks to see if a Working Channel is available.
- If a Working Channel is available, the Site Controller sends a message through the Downlink to the CEC/IMC's Uplink and the CEC/IMC. The Site Controller also sends a message to the originating mobile or portable radio via the Control Channel and to the Working Channel GETC. This message contains information concerning the Working Channel assignment.
- If the Talk Group is associated with multiple systems, the CEC/IMC sends a message through the CEC/IMC's Uplinks to the Downlink of all other affected systems.
- The other systems use their Site Controller to verify the Unit ID and Group ID and send a channel assignment message through their Downlinks back to the CEC/IMC.
- The CEC/IMC routes audio from the originating system to the other valid systems via the corresponding audio path for each system's Working Channel.
- The CEC/IMC also routes audio to the corresponding consoles that are programmed to receive that Talk Group.
- The radio's user releases the PTT switch that results in the radio transmitting a drop message over the assigned Working Channel.
- The Site Controller sends a drop message to the CEC/IMC.
- If multiple sites are involved, the CEC/IMC sends a drop message to the secondary systems on the MultiSite Network and to any corresponding consoles programmed to process the affected Talk Group.

In general, the same process applies for Clear Voice calls, Digital Group calls, I-calls, centralized telephone interconnect calls, and Data calls.

NOTE

The CEC/IMC routes status and message information through the Uplink and Downlink to the Site Controller and Control Channel GETC. The connections from each Working Channel GETC to the CEC/IMC provide an audio path rather than a status and message link.

SWITCH CHANNEL STATUS MESSAGE

The Site Controller continuously sends messages to the CEC/IMC verifying the data link's integrity. These messages contain the Site’s ID and are sent to the CEC/IMC, via the Main and Backup Downlink GETCs, every two seconds.

If, after waiting for about five seconds, the CEC/IMC fails to receive the Site ID message from the Site Controller via the Main Uplink and Downlink path, the CEC/IMC will follow programmed instructions and look for the Site Controller messages via the Standby Uplink and Downlink path.

If the Site Controller fails or if the system is configured without a Site Controller, it will operate in the Trunked Failsoft mode. In the Failsoft mode, the Control Channel GETC generates the channel assignments and communicates through the Backup Serial Link (BSL) and the Downlink to the CEC/IMC. The Downlink GETC generates the Site ID message and sends the message through the Uplink to the CEC/IMC.

Please refer to the Interconnection Diagrams section of this manual for detailed information on the connections within the Downlink and Uplink GETC Shelf.

ROCKWELL MODEM

Each GETC controls its corresponding modem and provides a high speed synchronous serial interface between the CEC/IMC and a trunked system. The Link GETCs use the Rockwell Modem to send and receive serial digital data representing system messages. Data transfer rates are 9600 bits per second (bps) using data grade four-wire telephone lines.

Along with transformer isolation, the modem provides automatic adaptive signal equalization and conditioning. This signal conditioning allows normal operation using input signal levels from -40 dBm to 0 dBm under ideal conditions.

Even though the Rockwell Modem has a 40 dBm dynamic range, it requires a 26 dBm Signal to Noise (S/N) ratio. The typical noise floor is approximately -36 to -40 dBm, therefore, the modem's practical dynamic range is approximately 0 to -36 dBm.

The Rockwell Modem demodulates the input signal and then transfers the resulting data to the GETC. The physical connections for the interface are at J3C-22, J11-1, J11-2, and U19-19.

In general, the Rockwell Modem performs digital to tone signal conversion, synchronous timing, training functions, and synchronous clock recovery on received data. The GETC's UART U19 and Rockwell Modem are collectively referred to as the "Phone Modem".

The modem senses a received signal by initiating a training state upon detecting an increase in the input signal level. The modem begins processing data at the end of the training state if the input signal is still above the nominal -40 dBm receiving threshold value. Otherwise, the modem returns to an idle mode if its below the threshold value.

GETC control signals determine the duration of the modem's training state at the time of power up. Resetting the GETC or cycling the GETC Shelf's operating power initializes the Rockwell modem for proper operation. Proper modem initialization and operation is indicated by the GETC illuminating LED indicator L2 on either the Downlink or Uplink front panel.

TURBO BOARD

The Turbo Board provides the Downlink GETC with additional memory and processing capability through two 8051 based processors and support circuitry. The Turbo Board also stores the Site Personality when running Link software and provides real-time debug capability.

Communication with the main GETC processor is through special memory locations in the 8K dual port RAM. In addition, each turbo processor has an RS232 serial port used for downloading both Turbo operational software and system personality to the Downlink GETC.

The Turbo Board uses mostly surface mounted components and mounts on stand-offs above the GETC. Electrical connections are made through a 28 conductor ribbon cable on the Turbo Board to the XU3 socket on the GETC. A small mechanical shield above the Turbo Board protects against inadvertent damage when sliding the GETC drawer in and out of the cabinet.

DOWNLINK AND UPLINK

The Downlink and Uplink GETCs are essentially modems connecting the CEC/IMC and Site Controller EDACS system components. Each Link GETC has two full duplex ports, a serial port operating asynchronously at 19.2K baud and a phone port operating synchronously at 9600 baud. The serial port of the Downlink is connected to either the Site Controller (through the MSL) when in the fully trunked mode or all the remaining site GETCs collectively bussed together (through the BSL) when in the trunked failsoft mode. The serial port of the Uplink is connected to the CEC/IMC (MIM Controller Board). In general, the system operates as shown in Figure 2.

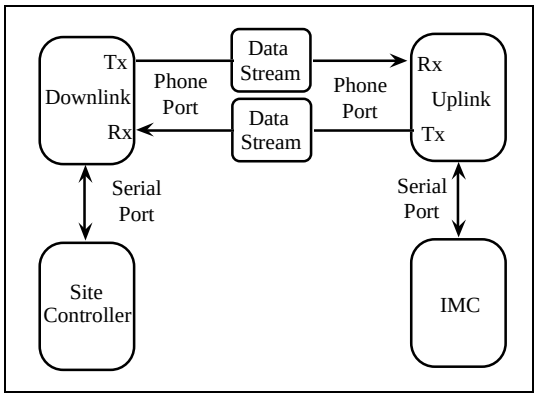


Figure 2 - Uplink to Downlink Communication

Communication among the various system elements is in the form of message packets. The GETC processes and transmits messages between the serial and phone ports. Since these two protocols are different, the Downlink and Uplink GETCs convert from one format to the other. The data formats are discussed in the next section. In addition, the Link GETCs perform data error detection, general control of timer and IO functions (DIP switch, LED's, UART's, etc.), receive and transmit buffer management, message scheduling, and Turbo interfacing.

PHONE PORT DATA FORMAT

Data is exchanged between the Downlink and Uplink synchronously at 9600 baud through the phone port. Data is difficult to analyze at this point since it is in tone form. However, data in digital form is accessible at test points within the GETC shelf. The phone port transmits a continuous bit stream within which is embedded the various system messages. The start of each message is identified with a “5712” sync byte which provides word synchronization.

Protocol Analyzer Setup: hex 8, sync, 9600 norm, MSB

Format:

AA AA ... AA 57 12 HH B1 B2 ... Bn CS AA AA ... AA

AA = idle bytes

5712= sync byte

HH= header byte

Bn= 1 to 12 message bytes

CS= inverted XOR check sum

Location: internally at J9-2, TP105 TxClk, TxD
TP107, J9-6 RxD, Gnd
externally at TB10-9,10 Tx (tone)
TB10-11,12 Rx (tone)

SERIAL PORT DATA FORMAT

Data is exchanged between the Link GETC and Site Controller or CEC/IMC asynchronously at 19.2K baud through the serial port. The serial port transmits out this port in bursts. The beginning of each message is identified with an 'AA' start byte.

Protocol Analyzer Setup: async 19200, N, 8, 1 hex8, norm, LSB

Format: AA HH B1 B2 ... Bn CS

AA = start byte

HH= header byte

Bn= 1 to 12 message bytes

CS= inverted XOR check sum

Location: internally at J8-1,2,3 (Tx,Rx,Gnd)
externally at J100-1,2,3 (Gnd,Rx,Tx)

CONFIGURATION

The configuration process involves the following procedures and should be completed in the order presented:

1. Hardware Installation - The Hardware Installation procedure verifies proper installation of GETC hardware.
2. Link Software Installation - The Link Software Installation procedure provides instructions for installing the Downlink and Uplink GETC operating software.
3. Link Turbo Software Installation - The Downlink Turbo Software Installation procedure provides instructions for installing the Link Turbo software.
4. Downlink Personality Programming - This step provides instructions for programming and storing system configuration data in the Downlink GETC.
5. Operational Checkout - The Operational Checkout procedure provides instructions for verifying the Downlink and Uplink GETC operation when the configuration is complete.

HARDWARE INSTALLATION

Both Downlink GETCs (Downlink and Standby Downlink) are located within the Site Controller cabinet along with a transmission Power Monitor, the Site Controller Computer, Alarm Panel, Test Panel, Power Supply, and Continuous Power Source. Power cable 19D903880P150 connects the operating voltage to the GETC shelf at TB10-6 and TB10-7. Cable 19D903880P21 connects the Failsoft serial bus to the GETC shelf at J102. Some of the above equipment, including the Standby Downlink, are optional. For complete cabinet cabling, refer to EDACS Site Controller Maintenance Manual, LBI-38985.

The Uplink GETCs are part of the CEC/IMC, but are mounted in a separate cabinet that contains up to nine paired Main and Standby Uplinks GETCs. A dedicated power supply and two fused power distribution panels provide the operating power for the Uplink GETCs. The power supply's are located in the bottom of the cabinet. Phone lines enter the cabinet's top and reach each Uplink's shelf through a connector panel 19B235360P1, and harnesses 19D902759 and 19B801676, refer to LBI-38662 for cabinet cabling.

GETC Logic Board Installation

The GETC Logic Board (19D904266G1) is installed at the factory and cabled for operation as a link GETC. A link GETC is similar to a standard GETC except for the addition of one special cable (19C336863G1) and harness (19B234809G3). For detailed information on the cable and harness, refer to the diagrams in the back of this manual. If for any reason the GETC Logic board is suspected of not functioning properly, refer to LBI-38894 for detailed instructions for removing, replacing, and testing the GETC Logic Board or the Regulator Board.

Turbo Board Installation

NOTE

The Uplink GETC does not require a Turbo Board.

As previously stated, Downlink GETCs use the Turbo Board 19D903536P1 for memory storage. If, the Turbo Board is suspected of not functioning properly, refer to LBI-38822 and SRN1061(SRN1062 if using 344A4414G2 software) for detailed instructions for removing, replacing, and testing the Turbo Board.

Rockwell Modem Installation

The Rockwell Modem provides a high speed synchronous serial interface between the Downlink GETC and the CEC/IMC's Uplink GETC. Technical specifications for the modem may be found in LBI-33031. Information on installing and testing the modem may be found in LBI-38894, and LBI-38822.

Modem Alignment

Use the following steps to set up the basic audio line levels. If the Station GETC is linked to a multisite system other than the CEC/IMC (i.e. Data Gateway), different levels may be required. Consult the applicable system installation manual for the required levels.

1. Ensure jumpers are installed on J11 pins 1 & 2 and J12 pins 1 & 2.
2. Apply power to the GETC.
3. Adjust the receive level by monitoring U18 pin 1 (refer to Figures 3 and 4) and adjusting the receive level potentiometer R1 (located on the GETC Logic Board) for 400 mVpp as measured with an oscilloscope (85 mVrms if using an RMS Voltmeter).
4. Verify the presence of demodulated signal data at TP107.
5. Adjust the transmit level potentiometer R2 for the maximum output level allowed by the phone line, microwave link, or equivalent communication line. For telephone lines linking the Downlink GETC to the CEC/IMC Uplink GETC, adjust R2 for .77 Vrms (0 dBm) measured across J6-8 and J6-9 (TB10-1 and 2). For microwave links, adjust R2 for -10 dBm across J6-8 and J6-9.
6. Initialize the modem by pressing S4 (on the GETC Logic Board) to reset the Downlink GETC or cycle the GETC Shelf's operating power.

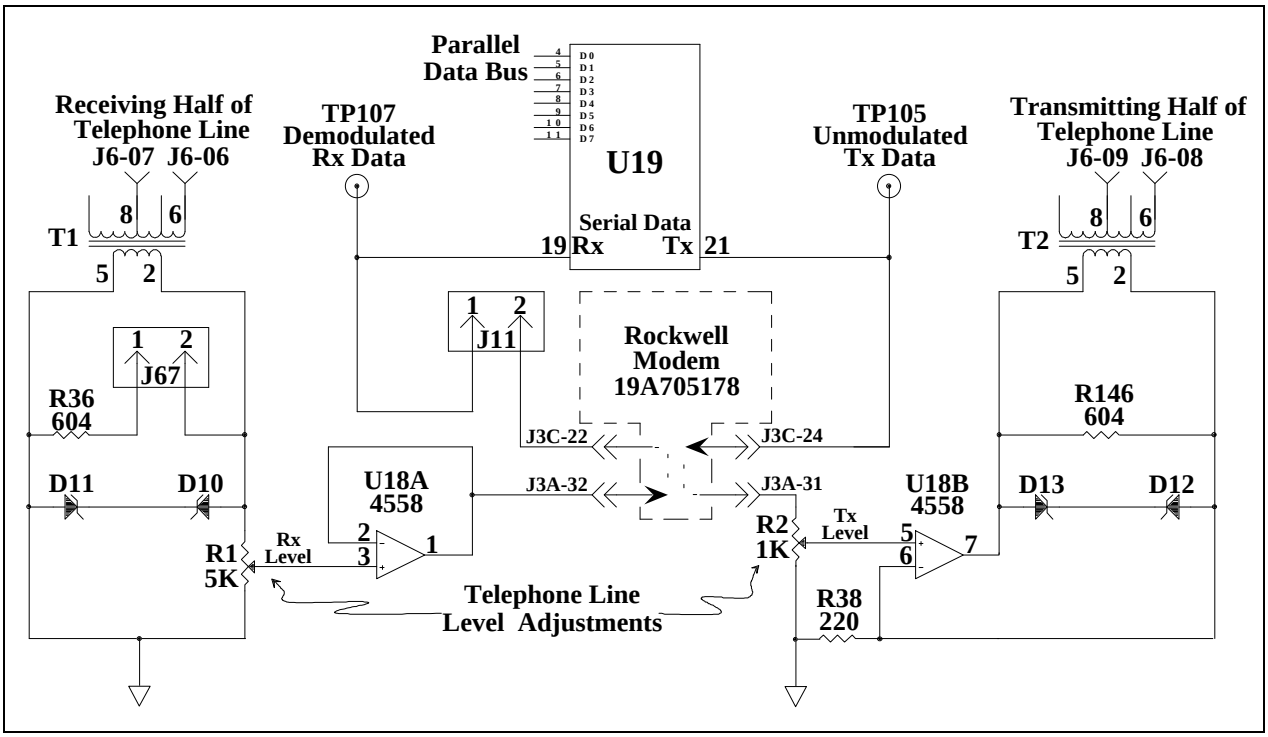


Figure 3 - GETC Phone Line Level Adjustments

Jumper Installation

There are a few jumpers on the GETC Logic Board which must be re-configured for link applications. The specific jumper configuration depends on the type of Downlink GETC (Wideband or Narrow Band) or Uplink GETC. To properly configure the GETC jumpers, refer to jumper tables in SRN1061 and install or remove jumpers according the intended GETC application. The location of the jumpers may be found using the board layout diagram in Figure 4.

LINK SOFTWARE INSTALLATION

The Link software installation procedure involves installing the latest version of the EPROM containing the Link GETC operating code into both the Uplink and Downlink GETC and to install the Turbo Board software into the Downlink GETC.

Link software, 344A4895, contains Downlink and Uplink functions that replaces standard GETC software installed in the GETC's U2 EPROM. Improvements in the Link software include enhanced performance and reliability. The Link software is compatible with all versions of GETC hardware to date. For software compatibility with other EDACS platforms, refer to SRN1061.

The following procedures provide instructions for installing the software when the Link GETCs function in a system with multiple Downlinks or a system with only a single Downlink.

NOTE

For Failsoft Patch operation, the Link software must be 344A4895 Group 4 (or later), Site Controller software must be 344A3265 Group 4 (or later), CEC/IMC and C3 Maestro Console must be Version 4.01 (or later), and Link Turbo Board software must be 350A1121 Group 4 (or later).

NOTE

For correct CTIS and Jessica operation, Link software 344A4895 Group 4 must be used only with Station GETC software 349A9607 Group 4 and Station GETC Turbo software 344A4414 Group 4.

Installing into a System with One or More Downlinks

Perform the following steps when installing the firmware in a GETC installed in a system with one or more Downlinks:

CAUTION

Observe precautions for handling **ELECTROSTATIC SENSITIVE DEVICES**

1. Power down the Downlink GETC and place it in the service position. Refer to LBI-38894 if necessary.
2. Remove the old EPROM (U2) from the GETC Logic Board.
3. Install the new EPROM, labeled 344A4895G4, into the XU2 socket, being sure to properly orient the chip.
4. If the Turbo Board 19D903536P1 is not present, install the Turbo Board. Refer to LBI-38822 for instructions.

NOTE

Be sure the Ferrite Toroid, part number REG70469/1 is installed on the Turbo Board harness when using 350A1121G4 software. Refer to LBI-38822 for installation instructions.

5. Power down the associated Uplink GETC and place the GETC in the service position.
6. Remove the old EPROM (U2) from the GETC Logic Board.
7. Install the new EPROM, labeled 344A4895G4, into the XU2 socket, being sure to properly orient the chip.
8. Power up both the Downlink and Uplink GETCs.
9. Download the Link Turbo software provided in the Link Turbo Media Kit 350A1121. Refer to section on Link Turbo Software Installation and SRN1061, TQ3357, and LBI-38822.
10. Program the GETC's personality and perform an operational checkout using the procedures contained in this manual and the detailed instructions contained in TQ3357 and SRN1061.
11. Repeat steps 1 through 10 for each Downlink GETC installed in the system.

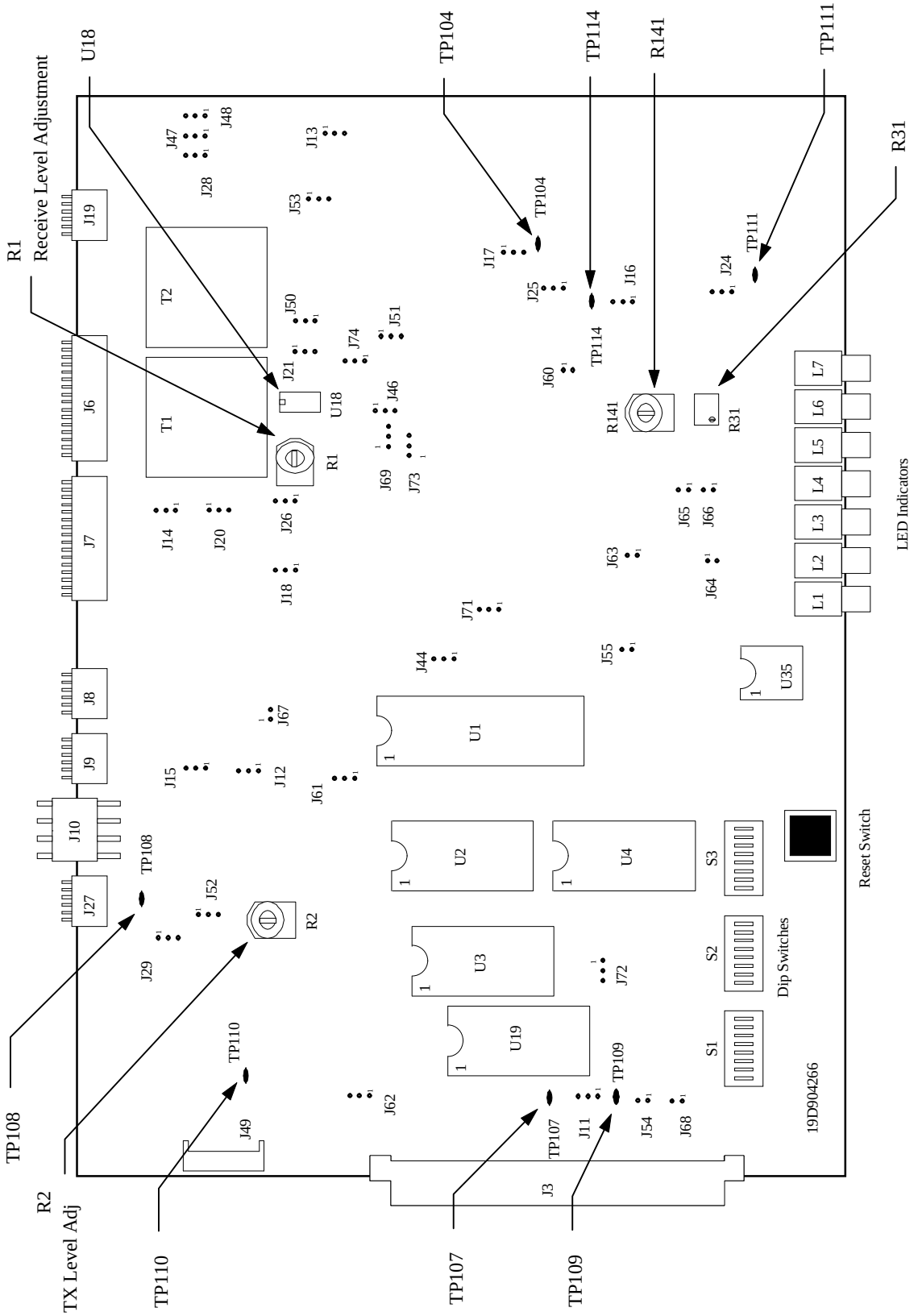


Figure 4 - Station GETC (19D904266) Jumper and Test Point Locations

LINK TURBO SOFTWARE INSTALLATION

This procedure provides instructions for downloading the Link Turbo software. The software is included in the Link Turbo Media Kit, 350A1121. The installation process involves downloading the GETC1E utilities to an IBM compatible personal computer (PC), and an interconnecting cable (TQ-3360) to download the new software to the Turbo Board in the Downlink GETC.

When downloading 350A1121 Group 4 (or later) software, the PC reads data from the files on the 350A1121 diskette and transfers the data to the Turbo Board microprocessors through connectors J103 and J104 at the rear of the GETC Shelf.

If the PC Programmer TQ3357 version 4 (or later) is available, both the Turbo software and GETC personality may be downloaded without changing setups. In addition, the PC Programmer will diagnose any problems between the PC and the GETC during the downloading process and simplify the handling and archiving of the Turbo software.

Equipment Required

- IBM PC/XT/AT or compatible with at least 640K memory, monitor and keyboard running MS-DOS version 3.0 or higher.
- Hard disk is recommended; but, not required.
- Serial Port configured as either COM1 or COM2.
- TQ-3360 programming cable.
- Male DB-25 to female DB-9 adapter or cable if the PC's serial port connector is a male DB-9 connector instead of a male DB-25 connector.
- Software distribution diskette 350A1121G4 (or later), refer to SRN1061 for software compatibility.

Load1e Utility

Prepare the PC for programming the GETC Turbo Board by performing the following steps:

1. Connect the TQ-3360 programming cable from the PC's serial port connector to the GETC Shelf connector J104 (A DB-25 to DB-9 adapter may be needed.)

Loading Turbo Software with TQ3357 Version 4 (or later)

1. Using the TQ3357's LOAD utility, copy the Link Turbo software (350A1121) into the PC Programmer's working directories.
2. Refer to TQ3357 "Upgrading Firmware With The LOAD1E Utility" for complete instructions on running load1e utility.

Loading the Turbo Software from DOS

1. Using standard DOS commands or a software file manager, create a directory named "**LOAD1E**" on the PC's hard drive. This step is only required for first time use. When upgrading, all existing files should be archived before copying the new files into the directory.
2. Make "**LOAD1E**" the current directory and copy the following files from the software diskette into the "**LOAD1E**" directory:
    - load1e.exe
    - 1etop.hex
    - 1ecrc.hex
    - 1ebot.hex
3. Run the **load1e.exe** program. Follow the on screen instructions and program the Turbo Board. Additional programming instructions may be found in SRN1061 and LBI-38822.

NOTE

When using Link Turbo software 350A1121 Group 4 (or later), re-programming the GETC Turbo Board will not alter previously stored Personality Data. When Personality Data is present, "**load1e.exe**" clears and performs CRC functions over the code portion of memory only.

DOWNLINK PERSONALITY PROGRAMMING

Personality refers to the system configuration data stored in the GETC's memory. The GETC's Personality includes system configuration information such as channel frequencies, call parameters, operating modes, and identification information.

The Downlink GETC personality is usually programmed the same way as the Control or Working Channel personality. There are several parameters that are required by the Downlink. These are listed below:

- Site ID must be entered.
- Multisite Downlink Channel allocation must be selected. Channel 27 and Channel 28 are the default. It is recommended that the channel number assigned to the multisite Downlink be the same as the Site Controller Port number to which it is connected.

  For example: Since the Site Controller ports 25 and 26 are typically reserved for the Downlinks, set the DLGETC device addresses to 25 and 26 and use the personality to identify devices 25 and 26 as being Downlinks. In this way, there will be a one to one correspondence between the Site Controller port, the System Manager port ID and the GETC device address.
- For Failsoft patch operation, personality parameter FS PATCH must be set to ENABLED.

The Personality Programming process involves using the TQ3357 GETC Shelf PC Programmer which includes the programming software to create the desired personality and transfer the Personality data to the battery backed-up RAM located on the Turbo Board.

We recommend using the TQ3357 version 4 software when programming the GETC's personality. Version 4 must be used to enable any of the new features available in the 344A4895G4 software. The TQ3357 version 4 also allows you to upload the GETC's Personality without changing the DIP switch settings.

NOTE

It is not necessary to recreate the personality when upgrading from Group 1 (or later) software to Group 4. However, to activate new features, read the existing personality and edit the personality as required.

Programming a Personality Through J100

When using TQ3357 version 3 (or earlier) you must program the personality through J100.

1. One end of the serial programming cable (TQ-3360) should be connected to the computer. The other end of

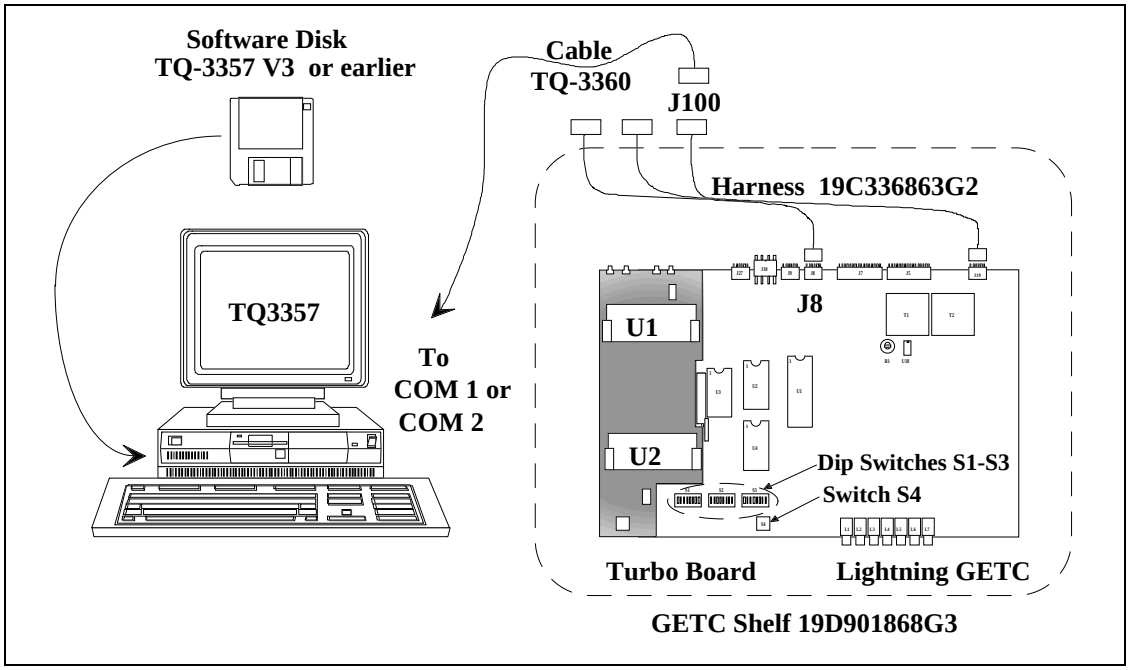


Figure 5 - System Hook-Up Using J100

the serial cable connects to the GETC Shelf connector J100, see Figure 5.

2. Set the GETC DIP switches S1, S2, and S3 for the programming mode as shown in Figure 6. DIP switches S1-S3 are located near the front of the GETC Shelf, see Figure 4.

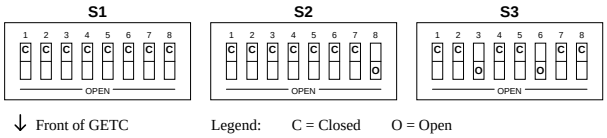


Figure 6 - DIP Switch Settings

3. Reset the GETC by either applying power or pressing the GETC RESET switch S4, see Figure 4, located just below the DIP switches. Resetting the GETC, in combination with the DIP switch settings, places the GETC into the Personality Programming mode.

4. Verify that front panel LEDs L3, L4, and L5 are ON, as shown in Table 2. This indicates the GETC is ready for programming.

Table 2 - Indicators in Programming Mode Using J100

LED Indicators	L1	L2	L3	L4	L5	L6	L7
Programming Mode	❍	❍	●	●	●	❍	❍

Legend: ❍ = OFF ● = ON ❇ = FLASHING

5. Proceed with the Personality programming as described in TQ3357.

6. After saving the personality and downloading it into the GETC, perform an operational checkout of the Downlink GETC.

Programming a Personality Through J104

When using TQ3357 version 4 (or later) program the personality through J104.

1. One end of the serial programming cable (TQ-3360) should be connected to the computer. The other end of the serial cable connects to the GETC Shelf connector J104. See Figure 7.

2. Move Switch S2 on the Turbo Board to the front placing the GETC into the Personality Programming mode.

3. Verify that front panel LEDs L6 and L7 are flashing, as shown in Table 3. This indicates the GETC is ready for programming.

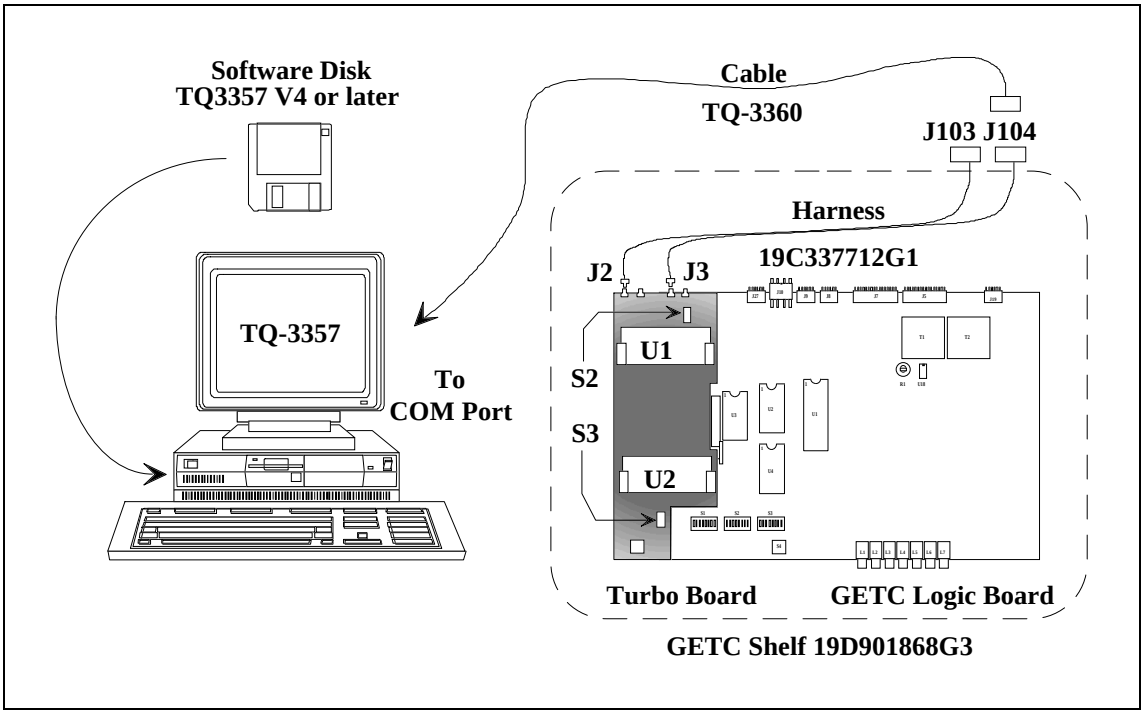


Figure 7 - System Hook-Up Using J104

Table 3 - Indicators in Programming Mode Using J104

LED Indicators	L1	L2	L3	L4	L5	L6	L7
Programming Mode	❍	❍	❍	❍	❍	❇	❇

Legend: ❍ = OFF ● = ON ❇ = FLASHING

4. Proceed with the Personality programming as described in TQ3357.
5. After saving the personality and downloading it into the GETC, perform an operational checkout of the Downlink GETC.

OPERATIONAL CHECKOUT

The Link software requires proper DIP Switch settings for S1, S2, and S3. Refer to Figure 4, for the switch locations and SRN1061 for the switch settings.

Verify that the GETC is operating correctly by performing the following steps:

1. Set the GETC dip switches S1, S2, and S3 according to the GETC's application, channel, and frequency. Refer to SRN1061 for DIP switch settings.
2. Verify correct LED indicators for the Downlink and Uplink as shown Table 4.

   When on, L2 indicates the correct installation of software and operational readiness of the either the Downlink or Uplink.

Table 4 - Downlink and Uplink LED Indicators

LED Indicators	L1	L2	L3	L4	L5	L6	L7
Downlink Failsoft Trunking	●	●	❍	❍	❍	❇	❍
Downlink in Fully Trunked system	❍	●	❍	❍	❇	❇	❍
Uplink active	❍	●	❍	❍	❇	❇	❍
Invalid DIP switch configuration	❍	❇	❍	❍	❍	❍	❍
Turbo Board failed/off condition	❍	●	❍	❍	❍	❇	❇

Legend: ❍ = OFF ● = ON ❇ = FLASHING

TROUBLESHOOTING

The hardware used in the GETC is extremely reliable, making component failure the unlikely cause of most problems. The most common causes of problems are programming errors and interface connections.

Use the following guidelines when troubleshooting a GETC on site:

1. Verify proper operation of front panel LEDs.
2. Verify that all cables are properly connected and secure.
3. Verify the GETC's personality is properly programmed for the specific application. Refer to TQ3357, PC Programmer and SRN1061.
4. In Downlink GETCs, verify the Turbo Board is properly configured if applicable. Refer to LBI-38822, TQ3357, and SRN 1061.
5. If you suspect that the GETC has failed, replace the GETC with a known good unit properly configured for this application.

DOWNLINK ACTIVITY LOGGER

A diagnostic feature introduced with the 344A4895 Group 4 software is the Downlink Activity Logger. This feature allows the Downlink GETC to log and save information about communication activity between the Downlink and Uplink GETC. In General, the information supplied by the Downlink Activity Logger is EDACS specific and in some cases may need technical assistance for interpretation. For detailed instructions on using the Channel Activity Logger, refer to SRN1061 and TQ3357 PC Programmer (version 4 or later).

IN CASE OF DIFFICULTY

If you are unable to resolve a problem to your satisfaction, then contact the Ericsson Technical Assistance Center (TAC) at 1-800-528-7711 (outside USA, 804-528-7711).

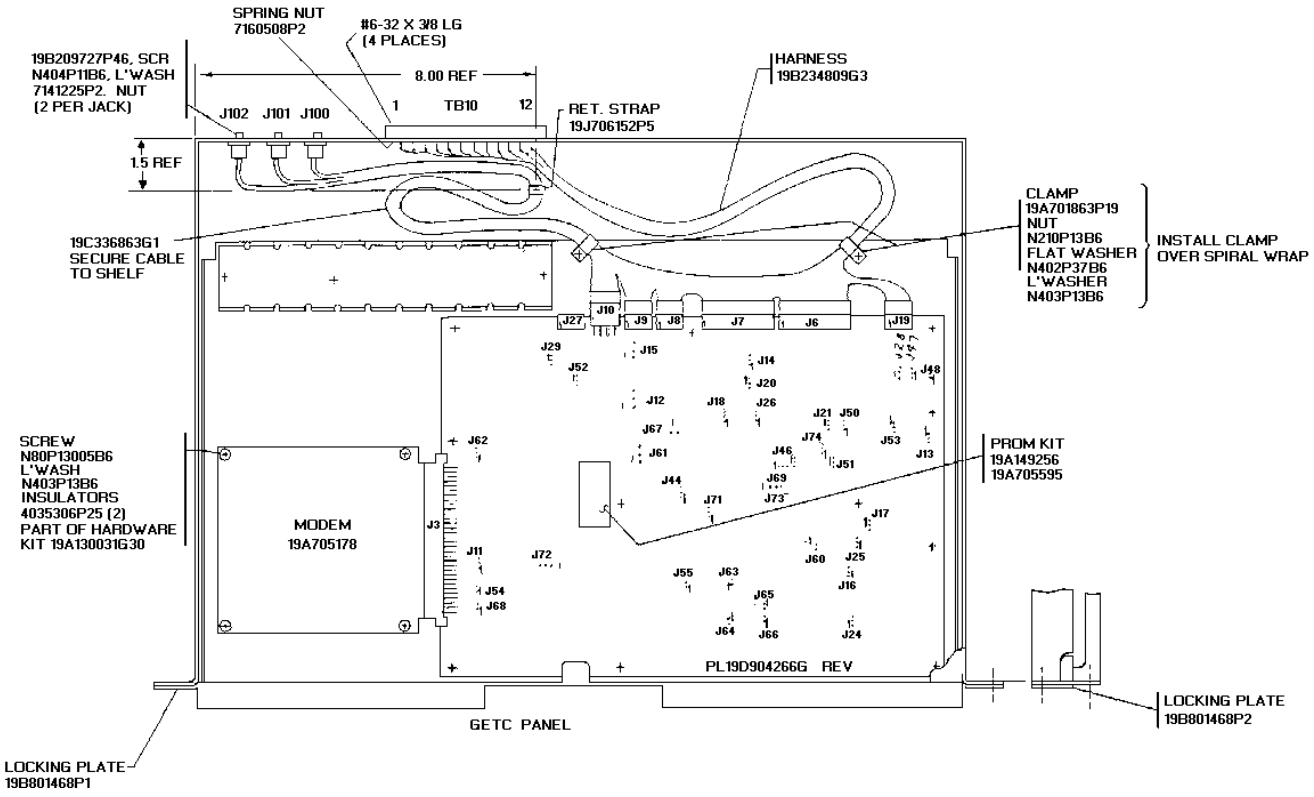
GETC J8/J102
Asynchronous; 19.2K Baud, 1, 8, 1, Normal, LSB
Application: Site Controller communication, Loading Personality.

Turbo Board J103/J3
Asynchronous; Variable 9600/19.2K Baud, 1, 8, 1, Normal, LSB
Application: Loading Turbo Personality.

GETC J19/J101
Asynchronous; 19.2K Baud, 1, 8, 1, Normal, LSB
Application: Backup Site Controller communication.

Turbo Board J104/J2
Asynchronous; 19.2K Baud, 1, 8, 1, Normal, LSB
Application: Loading Turbo Personality, GETC Personality, and Download Activity Logger.

Figure 8 - Communication Port Summary



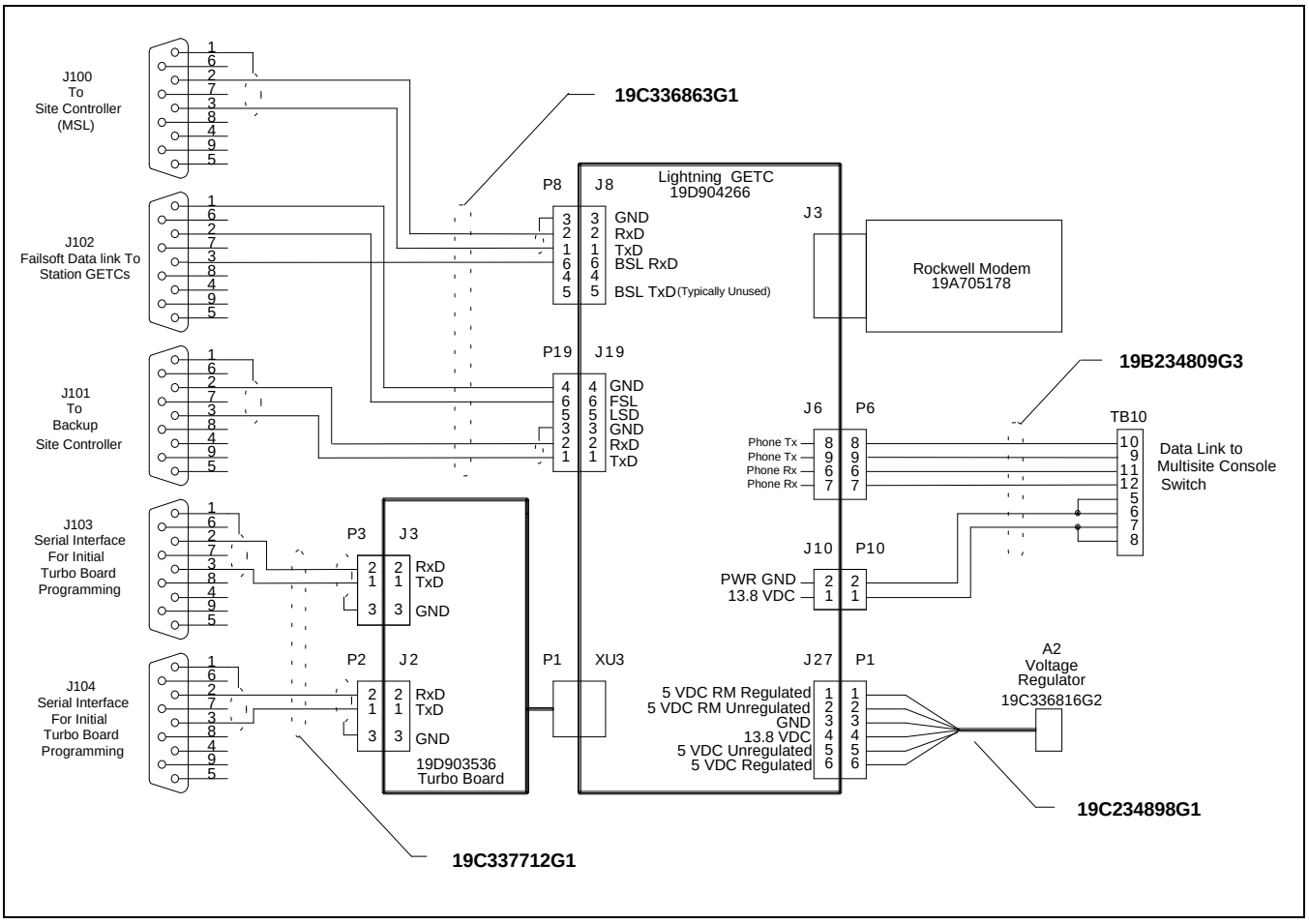
NOTE

Downlink Turbo Board not shown, Refer to LBI-38822 for Turbo Board Installation Diagram.

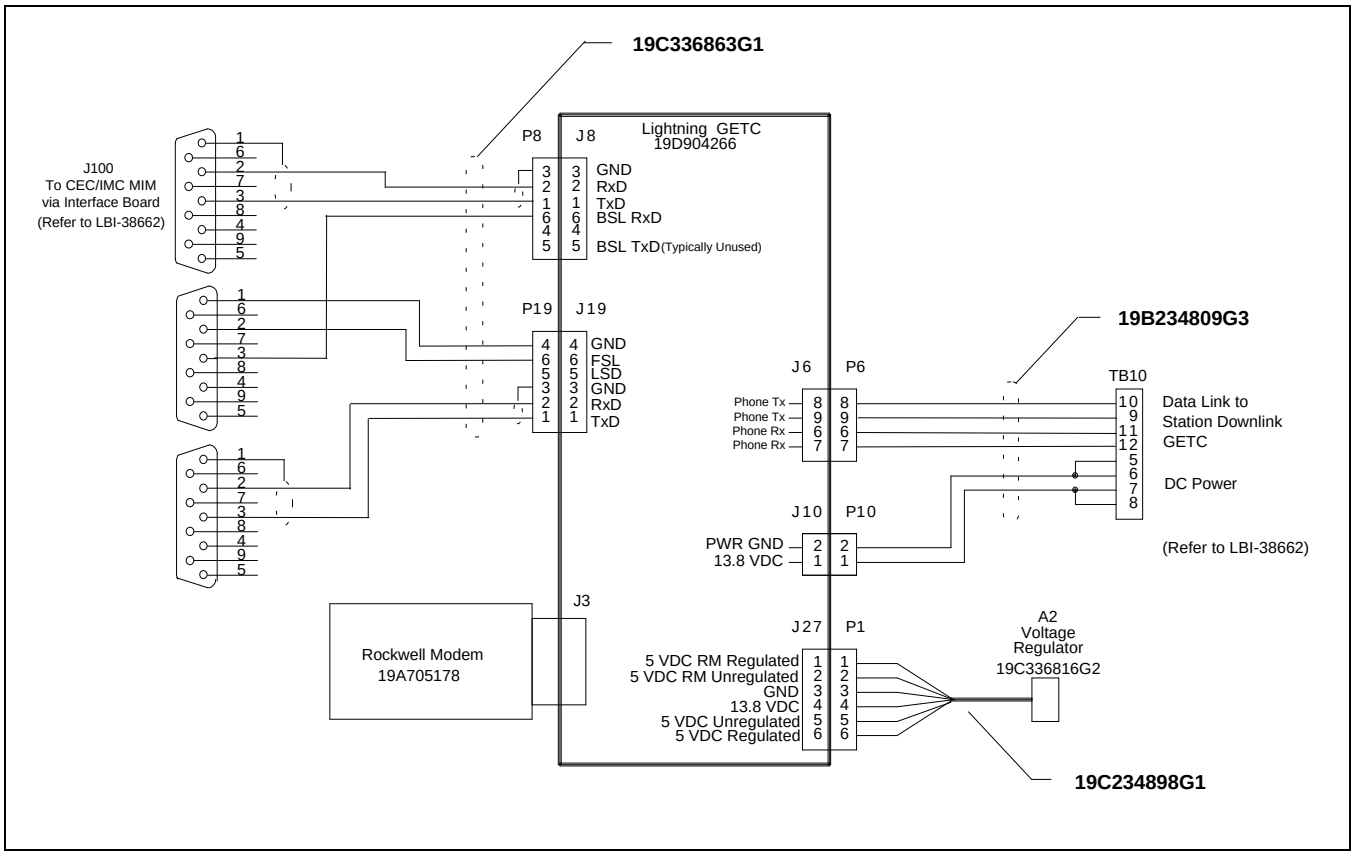
APPLICATION ASSEMBLY DIAGRAM

19D902535P5

(Made from 19D902535, Sh. 4, Rev. 10)



DOWNLINK GETC SHELF INTERCONNECT DIAGRAM



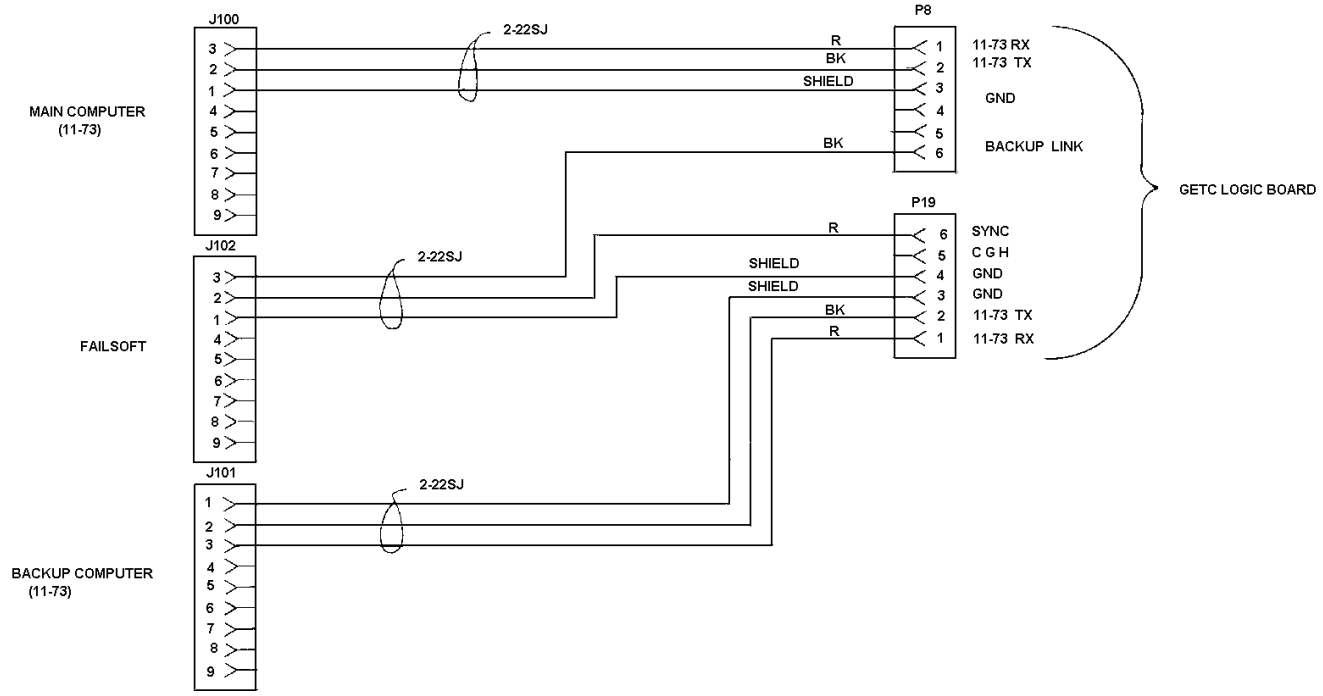
UPLINK GETC SHELF
INTERCONNECT DIAGRAM

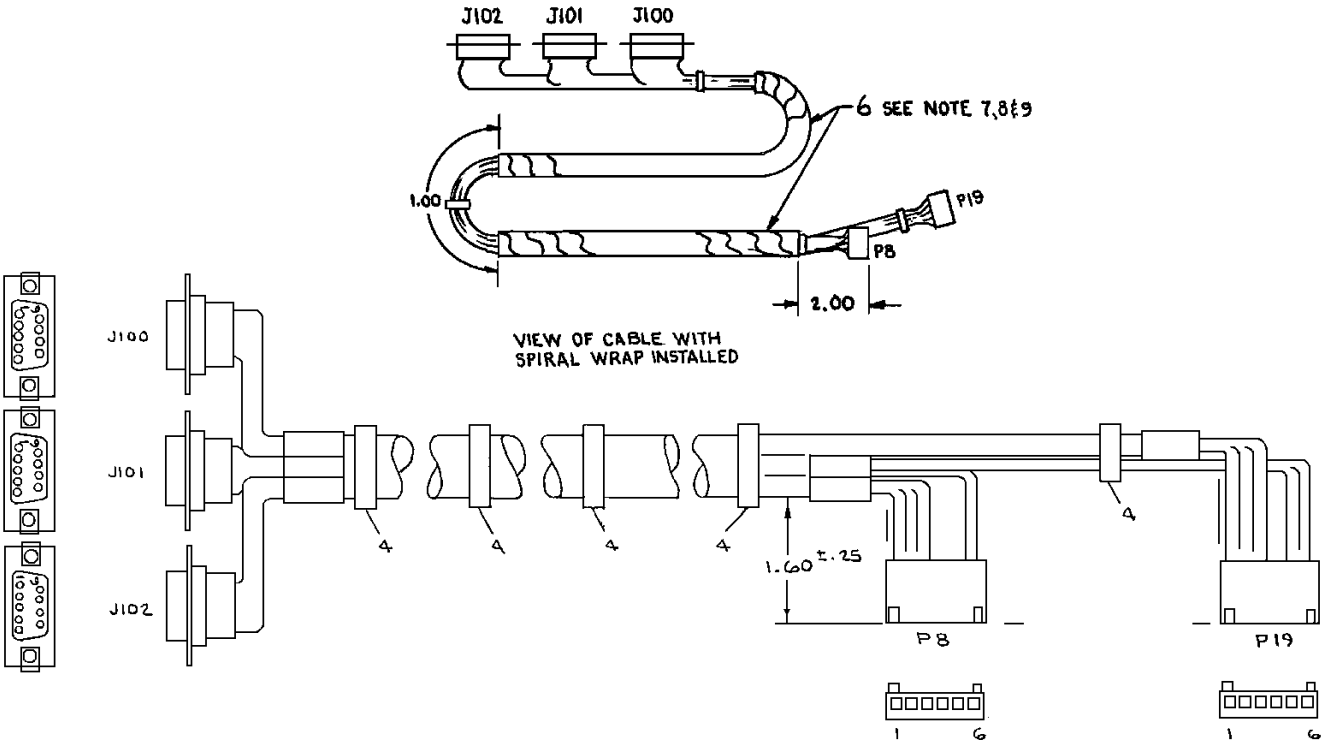
GETC CABLE
19C336863G1

SYMBOL	PART NUMBER	DESCRIPTION
		---------- JACKS ----------
J100 thru J102	19B209727P18	Connector: 9 contacts; sim to AMP 205203-1.
		---------- PLUGS ----------
P8	19A700041P32	Shell: 6-Position; sim to Molex 22-01-2065.
P19	19A700041P32	Shell: 6-Position; sim to Molex 22-01-2065.
		---------- MISCELLANEOUS ----------
2	19B209727P11	Contact, electrical: sim to AMP 1-66504-0.
3	19A704779P26	Contacts: 22-30 AWG; sim to Molex 08-55-0101, Qty of 10.
4	19J706152P5	Retainer strap: sim to Panduit Corp. SST-1.
6	19A149502P3	Sleeving, spiral.
13	19B209727P9	Machine Screw.

GETC HARNESS
19B234809G3

SYMBOL	PART NUMBER	DESCRIPTION
		---------- PLUGS ----------
P6	19A700041P42	Shell: 16-Position; sim to Molex 22-01-2165.
P10	19A116659P190	Shell: 2-Position; sim to Molex 09-50-3021.
		---------- TERMINAL BOARDS ----------
TB10	19C301086P8	Feed thru: 12 terminals rated 15 amps at 1200 VRMS; sim to GE CR151B75412AA.
		---------- MISCELLANEOUS ----------
2	N80P13004B6	Screw, machine: Pan head; No. 6-32 x 1/4".
3	N80P13007B6	Machine screw, panhead: No. 6-32 x 7/16.
5	19A116781P3	Contacts: 16-20 AWG; sim to Molex 08-50-0105 (Qty. of 10).
6	N403P13B6	Lockwasher: No. 6.
7	7160508P2	Nut, sheet spring: sim to Tinnerman C1356-632-24.
9	19J706152P5	Retainer strap: sim to Panduit Corp. SST-1.
19	19A149502P3	Sleeving, spiral.
22	19A115871P5	Wire, stranded, white-green.
32	19A700134P12	Wire, solid bare tinned copper; 38 AWG.
34	19A115871P29	Wire, stranded, orange 24 AWG.
37	19A115871P32	Wire, stranded, blue 24 AWG.
40	19A115871P36	Wire, stranded, violet 24 AWG.
41	19A116889P2	Wire, stranded, red 18 AWG.
42	19A116889P10	Wire, stranded, black 18 AWG.
44	19A704779P26	Contacts: 22-30 AWG; sim to Molex 08-55-0101, Qty of 10.

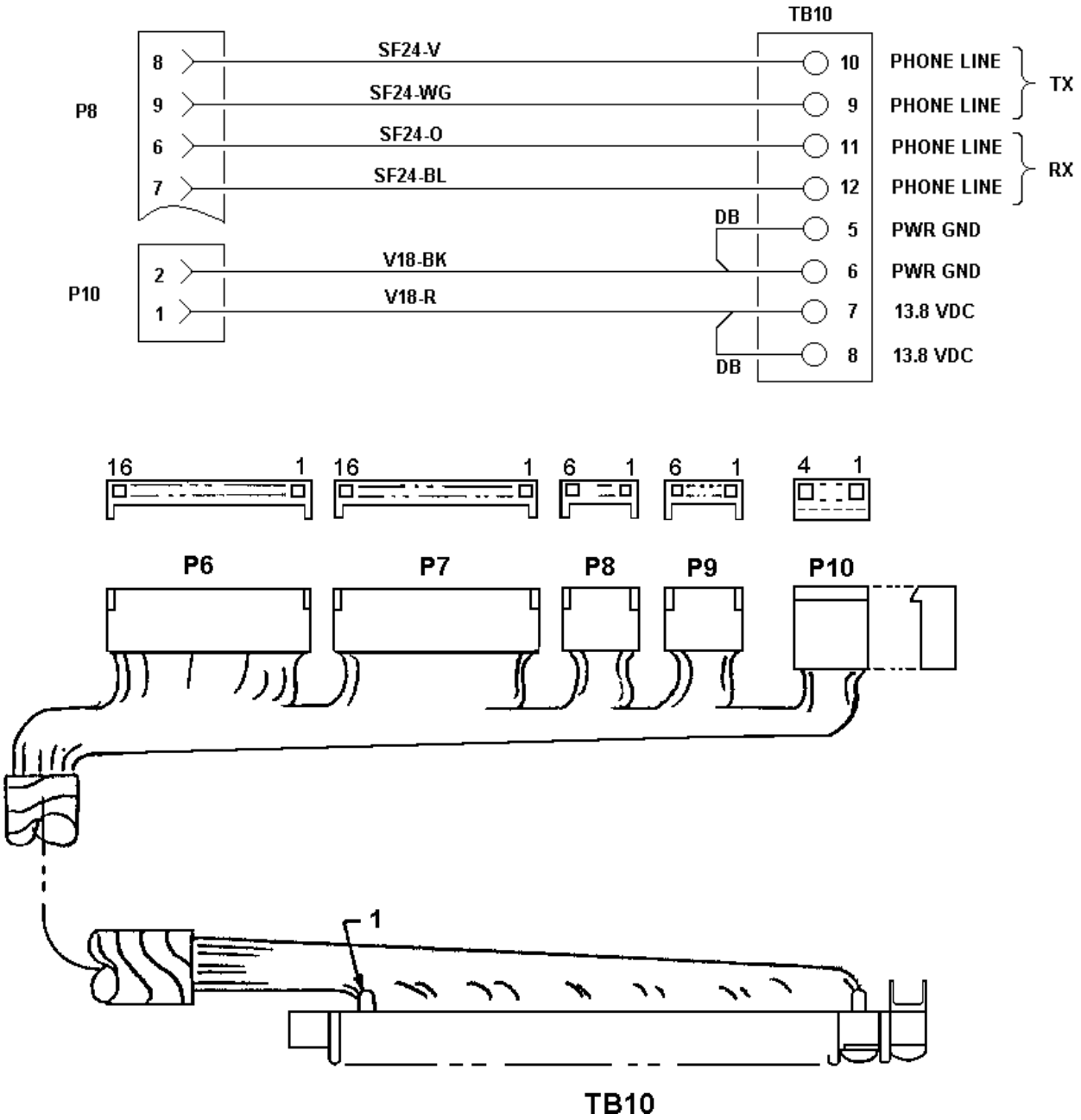




GETC CABLE

19C336863G1

(19C336863, Sh. 1, Rev. 4; 19C336866, Sh. 1, Rev. 0)



GETC HARNESS

19B234809G3

(19B234963, Sh. 1, Rev. 0, 19B234809, Sh. 1, Rev. 5)

NOTE

Connectors P6, P7, and P9 are tied back and not used.

Ericsson Inc.
Private Radio Systems
Mountain View Road
Lynchburg, Virginia 24502
1-800-528-7711 (Outside USA, 804-528-7711)

Printed in U.S.A.