SITE GETC CONFIGURATION MANUAL
FOR
TRUNKED SYSTEMS

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SCOPE

The GETC trunking card is used in many applications. This manual tells how to configure the GETC for use in a MASTR II station as a Working Channel, Control Channel, and as a Downlink. Figure 1 shows how Downlink, Working Channel, and Control Channel GETCs are used in a single-site system. A Backup Downlink is shown in the figure, however, this may not be used in all systems. Figure 2 shows how a Downlink GETC is used in a Multisite system. Communication between the Downlink and the TSIN is handled over a phone line or microwave link, depending on distance and customer requirements.

Supplemental information is provided in the GETC maintenance manual supplied with your system. When installing a replacement GETC into the system, be sure to note the software revision (group number) and re-vision number of the GETC.

Table 8 - Downlink GETC Indicators

INDICATOR	LED NUMBER	INDICATOR STATE	
		ON	OFF
L1	H7	Failsoft	Site Controller Link
L2	H6	Normal Operation	—
L3	H5	—	—
L4	H4	Switched to Backup Serial Port	Main Serial Port
L5	H3	—	—
L6	H2	—	—
L7	H1	—	—

Table 9 - Uplink GETC Indicators

INDICATOR	LED NUMBER	INDICATOR STATE	
		ON	OFF
L1	H7	—	—
L2	H6	Normal Operation	—
L3	H5	—	—
L4	H4	Switched to Backup Serial Port	Main Serial Port
L5	H3	—	—
L6	H2	—	—
L7	H1	active	backup

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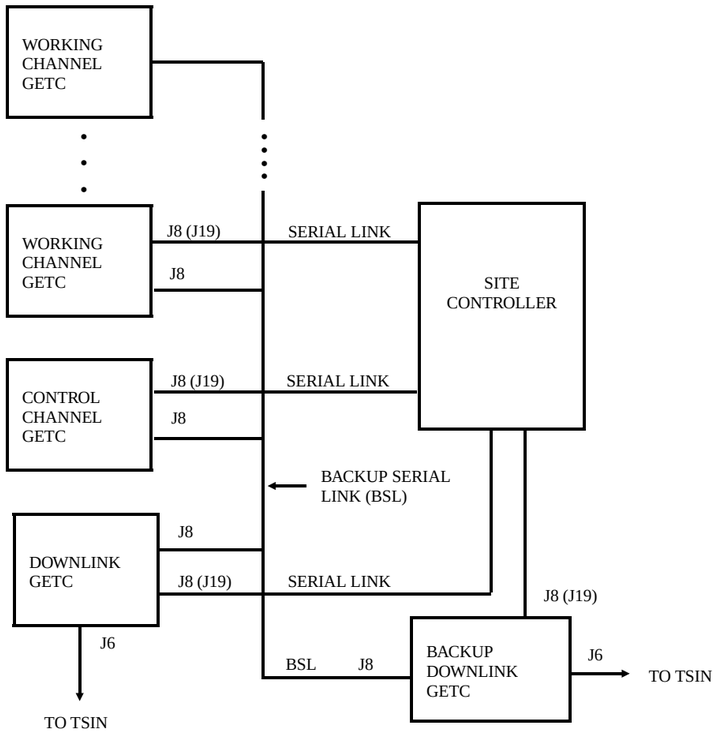

Figure 1 - Working Channel, Downlink, and Control Channel GETCs

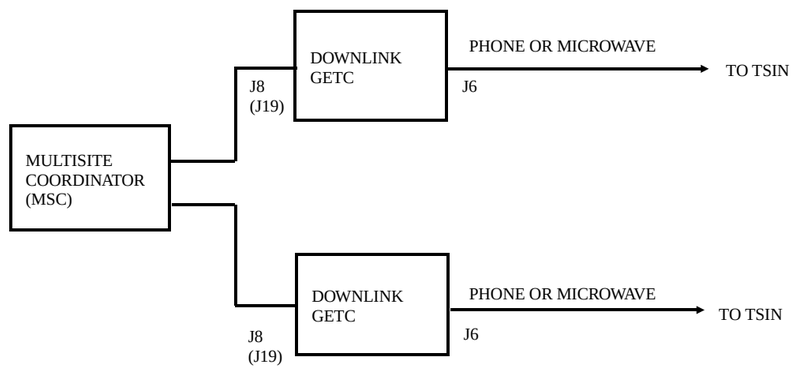

Figure 2 - Downlink GETC In Multisite Trunked System

JUMPER CONFIGURATION

Jumper configurations for MASTR II trunked station applications are listed in Table 1.

Table 1 - Jumper Configurations For MASTR II Trunked Stations

JUMPER	POSITION	FUNCTION
P11	J11-1 & 2	Enables receive data from 9600 baud modem board.
P12	J12- 1 & 2	Enables CTS from BSL.
P13	J13-1 & 2	Route backup serial link tx output to backup serial link rx input.
P14	J14-1 & 2	Master site controller path selection enable (11/73-1SEL).
P15	J15-1 & 2	Backup site controller path selection disabled.
P16	J16-1 & 2	Backup serial link selection enable.
P17	J17-1 & 2	Low-speed data encode path enabled.
P18	J18-1 & 2	Low-speed data decode path enabled.
P20	J20-1 & 2	Enables COMB PTT IN/POWER SENSE from station.
P21	J21-1 & 2	Enables high-speed, data-acquisition rate control (HSACQ).
P22	J22-1 & 2 J22-2 & 3	Use for 800 MHz applications. Use for 900 MHz applications.
P24	J24-1 & 2	Backup serial link selection (failsoft) enable.
P25	J25-1 & 2	Low-speed data encode path enable.
P26	J26-1 & 2	Use for 800 MHz applications. Omit for 400 MHz applications.
P28	J28-1 & 2	Sync line input path enabled.
P29	J29-1 & 2	Enables site controller RX data on J8-4.
P30*	J30-2 & 3	Enables clock drive to uP.
P44	J44-1 & 2	Selects 256K or 512K PROM size.
P45	J45-1 & 2 J45-2 & 3	Selects 2K x 8 bit RAM (not used). Selects 8K x 8 bit RAM (typical).
P46	J46-1 & 2 J46-2 & 3	Used for normal communication. Used in Digital Receiver Communications (collision detection) for voter.
P47	J47-1 & 2	Backup serial link select.
P48	J48-1 & 2	Backup serial link select.
P50	J50-1 & 2	Enables tone control for voted systems.
P51	J51-1 & 2	Morse code ID deviation control.
P52	J52-1 & 2 J52-2 & 3	TXD polarity select. TXD polarity select.
P53	J53-1 & 2 J53-2 & 3	Selects RXD data polarity. Selects RXD data polarity.
P54	J54-1 & 2 (jumper on)	Enables local control of (MODCNTL).
P55	OMIT	Disables WALSH bit 1.
P60	J60-1 & 2	Enables high-speed data path through data filter.
P61	J61-2 & 3	Selects 512K PROM size.
P62	J62-1 & 2	Selects 11 MHz modem chip (U4) clock frequency for 9600 baud data.
P63	OMIT	Sets TX data filter for 9600 baud.
P64	OMIT	Sets TX data filter for 9600 baud.
P65	OMIT	Sets TX data filter for 9600 baud.
P66	OMIT	Sets TX data filter for 9600 baud.
P67	J67-1 & 2	Enables receive telephone line termination (shunts with 600 ohms).
P68	J68-1 & 2	Selects Local (on)/Remote (off) control of station PTT.
P69	J69-1 & 2	Channel inhibit input from alarm system (simulcast systems only).
P70	J70-2 & 3	Enables monitoring of PA power level.
P71	J71-1 & 2	Enables control of telephone modem RTS.
P72**	J72-1 & 2 J72-2 & 3	Selects internal crystal oscillator. Allows use of external oscillator.
P73**	J73-1 & 2	Enables NOR gate U22B for PST applications.

NOTE

*Found only on 19D902104, Rev. C board.
**Found only on 19D902104, Rev. D board.

The locations of the jumpers on the 19D902104, Rev. C board are shown in Figure 3. The jumpers are <u>not</u> drawn in any particular configuration. Jumper locations on the 19D902104, Rev. D board are shown in Figure 4.

JUMPER	
PST SIMULCAST CONTROL PST TSIN, PST DOWNLINK, PST CC/WC	
P11	1 & 2
P12	1 & 2
P13	1 & 2
P14	1 & 2
P15	1 & 2
P16	1 & 2
P17	1 & 2
P18	1 & 2
P20	1 & 2
P21	1 & 2
P22	1 & 2
P24	1 & 2
P25	1 & 2
P26	1 & 2
P28	1 & 2
P29	1 & 2
P30	2 & 3
P31	4 & 5
P44	2 & 3
P45	1 & 2
P46	1 & 2
P47	1 & 2
P48	1 & 2
P50	2 & 3
P51	1 & 2
P52	1 & 2
P53	1 & 2
P54	1 & 2
P55	1 & 2
P60	1 & 2
P61	1 & 2
P62	OMIT
P63	OMIT
P64	OMIT
P65	OMIT
P66	1 & 2
P67	1 & 2
P68	1 & 2
P69	1 & 2
P70	1 & 2
P71	1 & 2

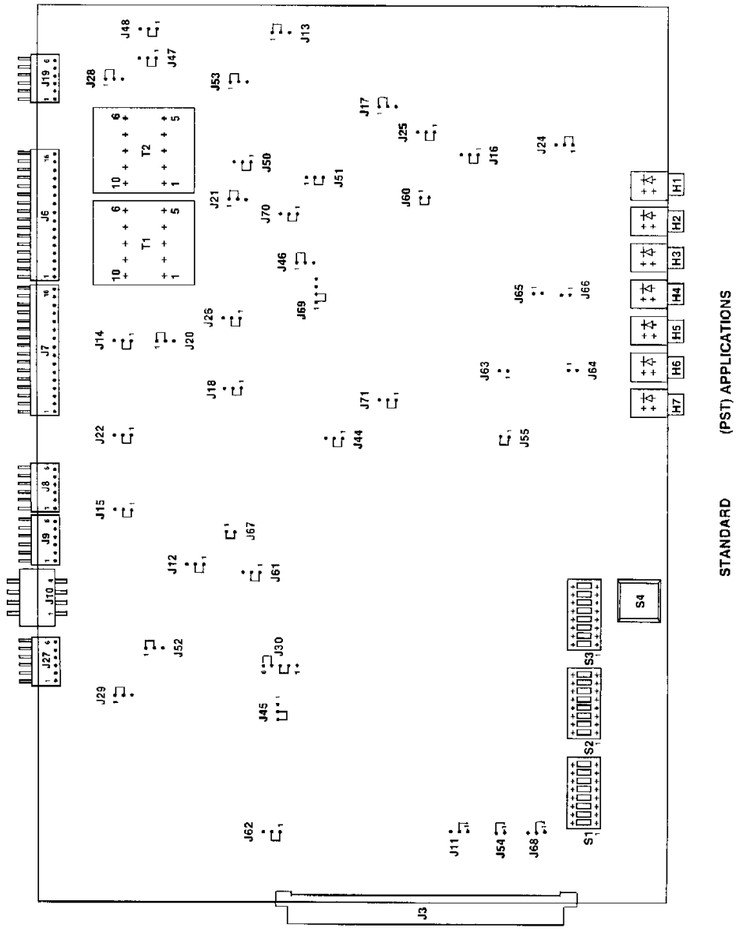

Figure 3 - Jumper For 19D902104, Rev. C

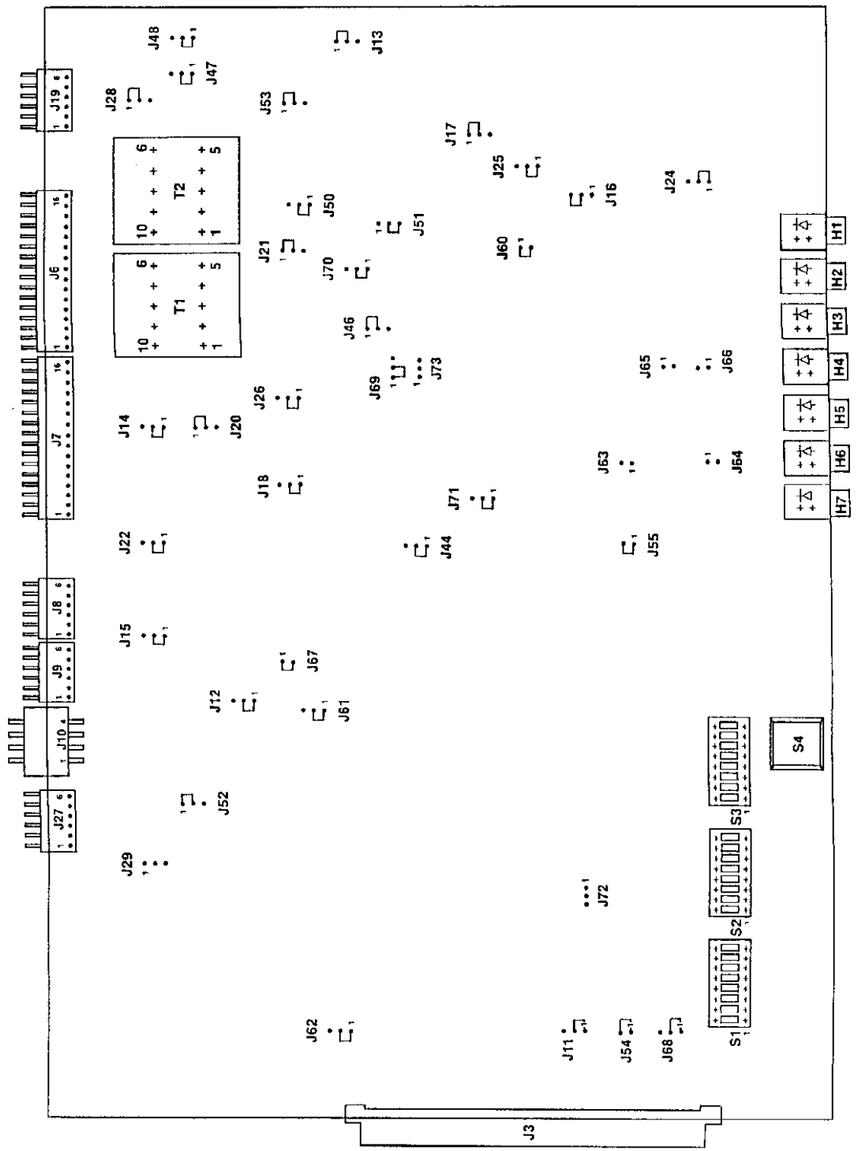

Figure 4 - Jumper Locations For 19D902104, Rev. D

MAIN SITE GETC SWITCH SETTINGS

The function for each of the main-site GETC switches is described in this section. Table 2 shows switch settings for Group 17 or later code. Switch settings for Group G16 or before are listed in Table 3.

Table 2 - Switch Settings For Group 17 or Later Code

	SWITCH 1								SWITCH 2								SWITCH 3							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
800 MHz Frequency	**Freq. Setting**								**Freq. Setting**															
Main Site								O								C	**Channel Address**						
Satellite Site Default Working Channel								C								C	**Channel Address**						O
Satellite Site Default Control Channel								C								C	**Channel Address**						C
Conventional Failsoft Disabled/SCAT Enabled													O											
Conventional Failsoft Enabled/SCAT Disabled													C											
Voice Guard Message Trunking (Failsoft)														O										
Voice Guard Transmission Trunking (Failsoft)														C										
Emergency Message Trunking (Failsoft)															O									
Emergency Transmission Trunking (Failsoft)															C									
C = Closed O = Open																								

Table 2 (Cont.)

	SWITCH 1								SWITCH 2								SWITCH 3							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Test Mode																O	**Test Select**							
Multisite/ GE-Switch Uplink (Default Active)								O								C	C	C	C	C	C	C	C	O
Multisite/ GE-Switch Uplink (Default Backup)								O								C	C	C	C	C	C	C	O	O
Forced Failsoft (Sweet 16)																								O
*Multisite/ GE-Switch Downlink								O								C	O	O	C	O	O			
*Multisite/ GE-Switch Downlink Backup								O								C	C	C	O	O	O			
*CML-Switch Downlink								O								C	C	O	C	O	O			
*CML-Switch Backup Downlink								O								C	O	C	C	O	O			
Clear Voice Message Trunking																						O		
Clear Voice Transmission Trunking																						C		
Simulcast																							O	
Non-Simulcast																							C	
C = Closed O = Open																								

*These are default settings. The Downlink addresses can be configured via the GETC personality prom.

Table 3 - Switch Settings For Group 16 or Earlier Code

	SWITCH 1								SWITCH 2								SWITCH 3							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
800 MHz Frequency	**Freq. Setting**								**Freq. Setting**															
Main Site								O																
Satellite Site								C																
Conventional Failsoft Disabled/SCAT Mode Enabled													O											
Conventional Failsoft Enabled/SCAT Mode Disabled													C											
Voice Guard Message Trunking (Failsoft)														O										
Voice Guard Transmission Trunking (Failsoft)														C										
Emergency Message Trunking (Failsoft)															O									
Emergency Transmission Trunking (Failsoft)															C									
RF Transmit Data Inverted																C								
RF Transmit Data Not Inverted																O								
C = Closed O = Open																								

Table 3 (Cont.)

	SWITCH 1								SWITCH 2								SWITCH 3							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Multisite Downlink								O									O	O	C	O	O	C	C	C
Multisite Uplink								O									O	O	C	O	O	O	C	C
Simulcast																							O	
Non-Simulcast																							C	
Forced Failsoft (Sweet 16)																								O
Simon Test																	O	O	O	O	O			
Downlink								O									C	O	C	O	O			
C = Closed O = Open																								

NOTE

Switch settings differ depending on software group number Check software group number marked on the PROM before setting switches.

SWITCH 1

Sections 1 thru 7 -- Sets transmitter frequency for 800 MHz applications.

Section 8 -- Used with input P1.6 to determine if shelf is operating as main or satellite site. Open switch for main site operation.

SWITCH 2

Sections 1 thru 4 -- Sets transmitter frequency for 800 MHz applications.

Section 5 -- Open disables conventional failsoft/Enables SCAT mode of operation.

A control channel will switch to conventional failsoft operation or become a SCAT channel if no response is detected from the working channels for six seconds.

Once a working channel is detected, the control channel will switch back to failsoft operation.

Section 6 -- When open, enables (failsoft only) Voice Guard message trunking (VoiceGuard applications only). When closed, enables Voice Guard transmission trunking (VoiceGuard applications only).

Section 7 -- When open, enables (failsoft only) emergency message trunking. When closed, enables emergency transmission trunking.

Section 8 -- RF transmit data invert.

For Group 17 software or later:

Open selects test mode. Closed selects normal mode. Two test mode types are available: DIP switch mode and interactive terminal mode. All station alignment and checks can be done using DIP switch test mode. Terminal mode (SIMON) is selected by setting S3-1 thru S3-6 all open and is used for testing the GETC board on the bench. The DIP switch test mode is selected by setting S3-1 thru S3-6 for the appropriate test and then resetting the GETC shelf. The tests are used to align the station data and audio levels. The available test settings are listed in Table 4.

NOTE

A manual reset or power-up is required to insure that the DIP switch settings have been read and activated after any switch change.

Table 4 - Test Settings

TEST	S3-1 THRU S3-6 POSITION	FUNCTIONS PERFORMED
A	000001	Keys transmitter and enables repeat audio path.
B	100001	Keys transmitter, enables repeat audio path, and sends continuous 400 Hz tone.
C	110001	Keys transmitter, enables high-speed data path, and sends continuous random high-speed data.
E	001001	Keys transmitter and enables repeat audio when carrier is present.
Z	111111	Interactive terminal test (SIMON) mode.

0 = closed switch
1 = open switch

Switch combinations not listed are undefined.

SWITCH 3

Sections 1 thru 5 -- Used to define channel address (Table 5). Each main site shelf at a site has a unique channel address.

Section 6 -- Used when channel 27 is selected (see SPECIAL FUNCTION).

For Group 17 software or later:

When switch 2-8 is closed, open to select clear voice message trunking and close to select clear voice transmission trunking.

When switch 2-8 is set for test mode, this switch sets the most-significant bit (MSB) of the test number. Open for 1 and close for 0.

Section 7 -- Open for simulcast, closed for non-simulcast operation.

For Group 17 software or later:

When Multisite Uplink operation is selected:

Close this switch for default active operation. Open this switch for default backup.
This is only significant when SW3-8 is open.

Section 8 -- Forced failsoft is enabled when open. Close for normal operation.

For Group 17 software or later:

In Multisite/GE-Switch Uplink mode, open enables backup operation and closed disables backup operation.

SELECTING 800 MHZ RF TRANSMIT FREQUENCY

The rf transmit frequency for 800 MHz applications is set by S1-1 thru S1-7 and S2-1 thru S2-4. These eleven bits encode the transmitter frequency, in the range from 850 to 870 MHz, at a 12.5 kHz channel spacing. At power-up, reset, or out-of-lock condition of the synthesizer, the GETC will attempt to load the transmit frequency code to the Synthesizer. The allowable transmit frequencies and their corresponding switch settings are listed in the table contained in the appendix.

INVERSION OF HIGH- AND LOW-SPEED DATA

The GETC is able to invert the high-speed and low-speed data to the Synthesizer-Exciter board (800 MHz). When switch S2-8 is closed, the high-speed and low-speed are not inverted. When S2-8 is open, the data are inverted. For normal operation, set S2-8 to the open (off) position. This function is only applicable for G16 and before.

SELECTING DEFAULT FAILSOFT OPERATION

Default failsoft operation is defined by S3-8. Setting S3-8 to open on a control channel will force failsoft operation at the next reset. This switch is set open only if the system is operating without a site controller.

GETC CHANNEL NUMBER SWITCH SETTINGS

Switch 3, sections 1 thru 5 are used to set the channel number for the station associated with the GETC shelf. These channel numbers are used by the Site Controller and System Manager when defining the system. Table 5 lists the available channel numbers and their associated switch settings.

Table 5 - Channel Number Switch Settings

CH #	GETC SWITCH 3 DIP SWITCH SELECTION (LSB) 1	2	3	4	(MSB) 5	CH #	GETC SWITCH 3 DIP SWITCH SELECTION (LSB) 1	2	3	4	(MSB) 5
0	C	C	C	C	C	16	C	C	C	C	O
1	O	C	C	C	C	17	O	C	C	C	O
2	C	O	C	C	C	18	C	O	C	C	O
3	O	O	C	C	C	19	O	O	C	C	O
4	C	C	O	C	C	20	C	C	O	C	O
5	O	C	O	C	C	21	O	C	O	C	O
6	C	O	O	C	C	22	C	O	O	C	O
7	O	O	O	C	C	23	O	O	O	C	O
8	C	C	C	O	C	24	C	C	C	O	O
9	O	C	C	O	C	25	O	C	C	O	O
10	C	O	C	O	C	26	C	O	C	O	O
11	O	O	C	O	C	27	O	O	C	O	O
12	C	C	O	O	C	28	C	C	O	O	O
13	O	C	O	O	C	29	O	C	O	O	O
14	C	O	O	O	C	30	C	O	O	O	O
15	O	O	O	O	C	31	O	O	O	O	O

O = open switch position (1)
C = closed switch position (0)

For Group 17 software or later:

Allowable working and control channels range from 1 to 24.
Allowable downlink channels range from 1 to 31. Typically downlinks are in the range 25-28. All uplinks use Channel 0 settings.

In channel assignments:

29 = call queued
30 = system busy
31 = call denied
28 = convert to callee

SPECIAL FUNCTION

When switch 3, sections 1-5 are set to channel number 27, sections 6 thru 8 form a mode-selection counter. The modes listed in Table 6 are currently defined.
This function is only applicable for G16 or earlier.

Table 6 - GETC Modes

GETC MODE	S6	S7	S8
MULTISITE DOWNLINK	C	C	C
MULTISITE UPLINK	O	C	C

O = open switch position (1)
C = closed switch position (0)

FRONT PANEL INDICATORS

The front panel LED indicators are used to display the state of operation of the GETC. Table 7 lists the indicators and their functions. If both L6 and L7 are on simultaneously, the GETC is in the control channel mode of operation.

Table 7 - Working Channel GETC Indicators

INDICATOR	LED NUMBER	INDICATOR STATE ON	OFF
L1	H7	Failsoft	Site Controller Link
L2	H6	Remote Audio path selected.	Normal Operation
L3	H5	Tx Load	—
L4	H4	Tx Data	—
L5	H3	Tx Clock	—
L6	H2	LSD/Voice	—
L7	H1	HSD	Voice Path