Mobile Communications

SINGLE CHANNEL AUTONOMOUS TRUNKING (SCAT)

Maintenance Manual

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LBI-38730

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INTRODUCTION

This manual contains information on the operation of a Single Channel Autonomous Trunking (SCAT) System. SCAT is designed to provide low traffic areas with access to Enhanced Digital Access Communications Systems (EDACS™) features using only a single fullduplex channel

SYSTEM ARCHITECTURE

A SCAT channel may either be configured as standalone or multisite.

The most basic configuration is a standalone with no console interface. This configuration consists solely of the SCAT channel.

The second configuration is when a SCAT channel is connected directly to a Multisite Controller (MSC) in a multisite application.

Each SCAT channel requires a standard EDACS Station with a SCAT station option. The SCAT option consists of a Downlink, a cable and SCAT software for both the station GETC and the Downlink. The cable provided is used to connect the SCAT channel to the Downlink GETC at their Backup Serial Link Ports. A four-wire telephone line (3002 grade, duplex line) is used for communication between the Downlink GETC at the site and the Uplink GETC at the MSC location. As shown in Figure 1, each Scat channel has its own Downlink and audio/data interface into the MSC. Multisite calls are routed under control of the MSC which resembles a normal EDACS Failsoft system. Figure 1 shows a typical connection to a Multisite system.

As seen in Figure 1 on the following page, the SCAT Site is configured as a dedicated site connected to the MSC through the Uplink GETC. Therefore, the maximum number of SCAT Channels on a Multisite network is equal to the maximum number of sites allowedon the MSC.

INSTALLATION

The SCAT GETC and the Downlink GETC are installed in an EDACS station cabinet using hardware kit (19A130031G30) provided. Refer to GETC Service Manual LBI-38174 for detailed GETC installation instruction. Install the Downlink GETC above the SCAT GETC. Connnect the cable provided (19C337102P1) between connectors J102 at the back of both GETC shelves. Connect power supply wires A+ and Ground from the station power supply to the Terminal Block at the back of the SCAT Downlink GETC shelf at pin 7 and pin 6 respectively.

SINGLE CHANNEL AUTONOMOUS TRUNKING (SCAT) OPERATION

The SCAT channel performs essentially 2 types of signalling. When idle, the SCAT channel transmits Control Signalling like an EDACS control channel. When a radio requests a channel, the SCAT channel assigns itself and transmits Assigned Signalling which only mobiles equipped with teh SCAT option understand. Once an unkey message is received by the SCAT working channel, the SCAT channel will revert back to an idle mode and resumes its control channel operation.

Except for interconnect call, all group and individual calls will appear as transmission trunked calls to the radio as well as to the MSC.

Local interconnect is not available on SCAT sites. Centralized interconnect is only available in the multisite configuration.

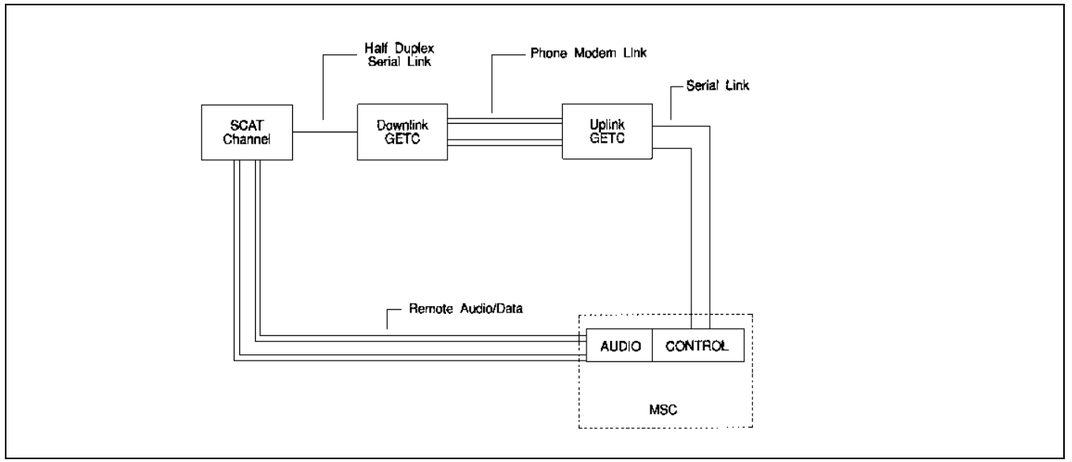

Figure 1 - SCAT System Block Diagram

CONTROL AND INDICATORS

FRONT PANEL LED INDICATORS

The front panel LED indicators of the SCAT GETC indicate the operational state of the SCAT channel. Upon power up, L1, L6 and L7 should be on indicating control channel mode. Upon receiving a channel request from a mobile, a channel assignment will be transmitted and L7 will be turned off indicating working channel mode. However, when a multisite call or a console call is received, L7 will be turned off and L2 will be turned on. LED indicators will indicate control channel mode again at the end of conversation.

Table 1 - LED Indicators

	L1	L2	L3	L4	L5	L6	L7
Control Channel	●	❍	❍	❍	❍	●	●
Assigned Clear Voice Channel (Local site initiated call)	●	❍	❍	❍	❍	●	❍
Assigned Clear Voice Channel (Multisite initiated call)	●	●	❍	❍	❍	●	❍

● = LED lit

DIP SWITCHES

There are three DIP switches on the GETC board that must be configured for proper SCAT operation. S1-1 thru S1-7 and S2-1 thru S2-4 are used to set the transmitter operating frequency of the SCAT station. S3-1 thru S3-5 are used for channel number selection. Select channel number 1 for SCAT channel. Refer to LBI-38176 for proper switchsettings. Set the remaining switches as shown in Table 2.

Table 2 - SCAT GETC Switch Settings

S1								S2								S3							
1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
F	F	F	F	F	F	F	O	F	F	F	F	C	C	O	C	A	A	A	A	A	O	C	O

A = Channel number (LBI-38174)
F = Frequency setting (LBI-38174)
C = Closed
O = Open

Downlink GETC DIP switches should be set as shown in Table 3.

Table 3 - SCAT Downlink GETC Switch Settings

S1								S2								S3							
1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
C	C	C	C	C	C	C	O	C	C	C	C	C	C	C	C	O	O	C	O	O	C	C	O

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SCAT GETC Jumper Configuration

SCAT GETC jumpers should be configured as EDACS Control Channel/Working Channel. Refer to GETC LBI-38174.

PROGRAMMING

It is necessary for the Personality EEPROM of both the SCAT and the Downlink GETCs be programmed properly for SCAT operation. The Personality EEPROM is programmed by using the GETC PC Programming Software TQ-3357. Put the GETC board in the PC Programming Mode by setting switches S2-8, S3-3 and S3-6 in the open position with the remaining S3 switches in the closed position after which the GETC board should be reset. Connect Programming Cable TQ-3360 from the PC ComPort to J100 at the back of the GETC shelf. Refer to the GETC PC Programming manual for programming information.

Both the SCAT and the Downlink Personality EEPROMs are programmed the same way as shown in Figure 2.

MSC Personality/Configuration

To maximize the availability of SCAT channel for usage, SCAT site should be configured as a TRACKED site. As a TRACKED site, the SCAT channel only receives requests from the MSC for Multisite, like calls that have been logged in the SCAT file. Other multisite calls that are not logged in the site will not be routed to the SCAT site by the MSC, therefore making the SCAT site available for users that are already on the SCAT site.

USER OPERATION

The fact that SCAT is a one-channel site implies that only one conversation can occur at any one time through the SCAT site. While the SCAT site is busy, every call request (mobile request or console preempt) will be denied. Only console preempt for theactive group will be processed immediately.

Group call late entry at SCAT Sites can only be performed by radios equipped to use a SCAT channel.

The SCAT channel and SCAT radios are designed to minimize the overloading of the inbound SCAT channel by call prioritization. Call prioritization is a scheme which will give high priority calls (emergency, console) greater chance of accessing the SCAT channel over lower priority calls.

Except for interconnect call, all group and individual calls will appear as transmission trunked calls. This is done to assure the mobiles' quick return to look for the control channel.

SCAT sites only support the Centralized Telephone Interconnect System for interconnect calls.

Personality: C:\GE\GTC\RADIO\SCAT_PER.GTC

Radio Text
These are SCAT Site and SCAT Downlink Personalities.
Centralized Telephone Interconnect System (CTIS) Option is enabled.

Channel Allocations

Channel Number	1 1234567890	2 1234567890	3 1234567890	12
Control Channel	Y.........	....	....	..
Clear Voice	Y.........	....	....	..
Voice Guard	....	....	....	..
Data	....	....	....	..
Pager	....	....	....	..
Interconnect	....	....	....	..
Downlink	....	....	....	..
Multisite Downlink	....	....	......Y...	..
External CIU	....	....	....	..

Channel Data

System Type:WIDE BAND

Ch #	Freq (MHz)	Ch #	Freq (MHz)	Ch #	Freq (MHz)
1	857.0125	11	0.0000	21	0.0000
2	0.0000	12	0.0000	22	0.0000
3	0.0000	13	0.0000	23	0.0000
4	0.0000	14	0.0000	24	0.0000
5	0.0000	15	0.0000	25	0.0000
6	0.0000	16	0.0000		
7	0.0000	17	0.0000		
8	0.0000	18	0.0000		
9	0.0000	19	0.0000		
10	0.0000	20	0.0000		

Site Data

Site Name : SCATSITE1
Date : 08/21/92
SITE ID : 9
Morse ID :

Channel Assignment	:	Descending	Individual Call Hang	:	5
Rotating Assignment	:	No	Group Call Hang :	5	
Site Ch/Frq Notification	:	No	Special Call Hang	:	30
Individual Call Update	:	One Slot	Voice Guard Hang	:	0
Logical IDs above 8192	:	Yes	Emergency Call Hang	:	5
SCAT	:	Yes	System All Call Hang	:	5
Multisite System	:	Yes	Transmiss Trunked Timer	:	120
Simulcast System	:	No	Message Trunked Timer	:	300
Voter System	:	No	Morse Interval Timer	:	0
CTIS	:	Yes	Test Call Timer	:	0
			Max Interconnect Calls	:	1

Figure 2 - GETC, Rev. E, F

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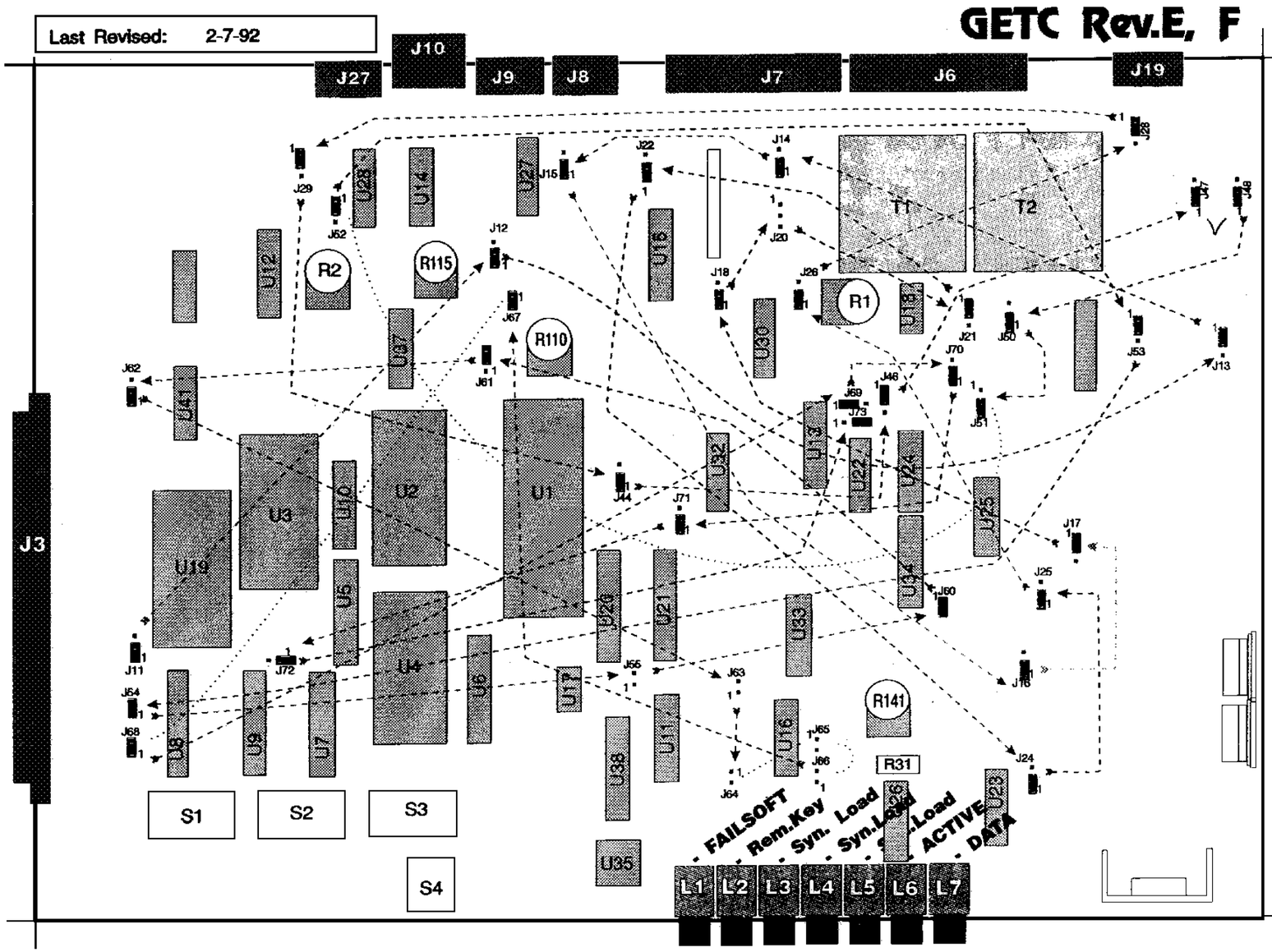

P11	1-2	RxD R-M (2-3 for RS-232)
P12	1-2	CTS R-M (2-3 for RS-232)
P13	1-2	BSL Tx Rx Common
P14	1-2	Master Site Cont."ON"
P15	1-2	Backup "OFF"
P16	1-2	BSL "SW Control"
P17	1-2	LSD Encode Enable
P18	1-2	LSD Decode Enable
P20	OMIT	"Hard Inhibit" OFF
P21	1-2	Data Acquisition Control
P22	1-2	4800 Notch (2-3 - 400MHz)
P24	1-2	BSL Select
P25	1-2	LSD Encode Enable
P26	1-2	Synth. Lock Detect
P28	1-2	FSL Path
P29	1-2	
P44	1-2	EPROM >=256K
P46	1-2	
P47	1-2	BSL
P48	1-2	BSL
P50	1-2	
P51	2-3	MORSE ID
P52	1-2	TxD Polarity
P53	1-2	RxD Polarity
P54	1-2	A/D Control - Local
P55	OMIT	LSD - Local
P60	1-2	9.6 Tx. Data - Local
P61	2-3	EPROM -512K
P62	1-2	11 MHz Clk Select
P63	OMIT	Tx.Data Filt.BW
P64	OMIT	Tx.Data Filt.BW
P65	OMIT	Tx.Data Filt.BW
P66	OMIT	Tx.Data Filt.BW
P67	1-2	Phone / 600-ohm Term.
P68	1-2	PTT - Local
P69	1-2	"Inhibit" vs "Comp" Sel.
P70	1-2	"Inhibit" vs "Comp" Sel.
P71	1-2	RTS Select
P72	1-2	Local 11 MHz ON
P73	2-3	Decouple PTT & Inhibit

NOTE:
For 400-MHz: P22 is 2-3
For Voted w/o R-M: P11 & P12 are 2-3