MAINTENANCE MANUAL
TEST UNIT ALARM INTERFACE
AND CONTROL CHANNEL MONITOR

SYSTEM DESCRIPTION

This document describes the portion of the system specifically intended for use with EDACS® system test calls - the Test Unit and TUAI.

The **T**est **U**nit **A**larm **I**nterface (**TUAI**) is implemented on a GETC (refer to GETC Maintenance Manual LBI-38894). The primary function of the TUAI is to take test results from the Test Unit and each of the Receiving Units (one per channel) and provide to the Alarm Reporting System a pass/fail indication for each channel. Each TUAI can handle up to five (5) consecutive channels. The **"low"** and **"high"** channel numbers are specified with DIP switches **SW1** and **SW2**. The Test Unit data sent is paralleled to multiple TUAI's to handle systems with more than 5 channels.

The TUAI consists of the following items (refer to Application Diagram 19D902679, Sheet 2):

ITEM	PART NUMBER
• Shelf	19D438294G1
• Radio	19C851571P3
• RF Cable	19B234962G1
• Buffer Board	19C337055G1
• Power Cable	19D438359G2
• Support (Buffer Bd.)	19C851927P1
• Attenuator	19B234961G1
• Factory Hardware	PL19A149898G3
• Staging Hardware	PL19A149898G4

ERICSSON ⣿

BUFFER BOARD ASSEMBLY 19C337055G1

The Buffer Board Assembly consists of the following items (refer to Assembly Drawing 19C337055):

- Buffer Board (A1) 19C336920G1 (refer to Buffer Board Maintenance Manual LBI-38236)

- Buffer Board Assembly 19C337055P1 (Item 1)

- Buffer Board Plate 19C337061G1 (Item 2)

- Machine Screws N8P13004B6 (Item 3) (Qty. 4)

- Lock Washers N404P13B6 (Item 4) (Qty. 4)

The Block Diagram in Figure 1 shows the Stand Alone Test System at a remote site.

TEST UNIT OPERATION

This section describes Test Unit Operation. The TU performs the test call function and control channel monitoring.

CONTROL CHANNEL MONITORING

Monitoring of the control channel at the EDACS site is a primary function of the TU. When the TU is performing this function, it is in the monitor state. The TU is normally in the monitor state whenever it is not performing another task. Control channel monitoring consists of the following:

- Obtaining sync on the control channel.

- Monitoring the outbound control channel for correctly received messages.

- Verifying the site ID (comparison with programmed personality).

When the TU detects a control channel fault, it sends a message to the TUAI indicating the type of fault which has occurred. The fault is sent back through an alarm system to the channel GETC and then to the site controller. The faults are logged and the appropriate action is taken. When the Site Controller decides to bring up a new control channel, the TU automatically scans for the new control channel, obtains sync on the new control channel and if successful, begins monitoring the new channel.

TEST CALL

When the test call command is seen on the outbound control channel, the TU performs the Test Call. The Test Call checks the control channel and the working channel in a simulated mobile-originated, channel-request sequence. It also checks the high-speed and low-speed data transmitted over the working channel. The major steps in the sequence are:

Figure 1 - Stand Alone Test System Block Diagram

- Site Controller initiates the Test Call by sending a Test-Call-Request on the outbound control channel. This directs the TU to request a channel assignment.

- The TU requests an individual call.

- As directed by the Site Controller, the control channel transmits the request to the assigned working channel.

- The TU receives the channel assignment, goes to the working channel and monitors the high speed data for a channel confirmation.

- The TU sends the high-speed key message followed by the low-speed data.

- The working channel detects the messages from the TU and transmits low speed data.

- The working channel transmits the drop-channel message after two seconds of no **"INSound"** activity on channel.

- The TU receives the drop-channel message, returns to the monitor state and resumes control channel monitoring.

- The TU keeps track of Test Call progress and sends the results when it exits the test-call state.

TUAI INPUTS

The **Test Unit** (**TU**) radio communicates to the TUAI, over a 19.2 kbaud, 8 bit, no parity, one (1) start bit and one (1) stop bit serial link. The messages, which are on this link, are as follows:

CC FAIL message - (AA) (94) (d1) (d2) (P)
(d1) byte 1 = 0 f6 0 0 0 0 0 0

(d2) byte 2 = 0 0 0 c4 c3 c2 c1 c0

Where: For f6, 1 = lost sync on control channel
c4-c0 = control channel number, in binary.

This message is sent when sync is lost on the control channel, thus **f6** is set. The message is also sent whenever the **TU** receiver synchronizes to a control channel and in this case the **f** field (d1) is all zeros. This is done to keep the **TUA1** informed of the control channel number.

TEST CALL REQUEST message-
(AA) (93) (d1) (d2) (P)
(d1) byte 1 = 0 0 0 c4 c3 c2 c1 c0

Where: c4-c0 = control channel number to be used in test call.
w4-w0 = working channel number to be used in test call.

This message is sent whenever the Test Unit Receiver decodes a Test Call Request message on the outbound control channel. The TUAI uses this message to tell when the test call starts so it can check the control and working channel

receiver to see if they also saw the Test Call Request on the BSL from the control channel monitor. This is determined by the state of the fault indicator inputs from the two test channels being in the fault or (low) state.

CALL RESULTS message -
(AA) (92) (d1) (d2) (P)

(d1) byte 1 = 0 0 t5 t4 t3 t2 t1 t0

(d2) byte 2 = 0 0 0 w4 w3 w2 w1 w0

Where: For t5, 1 = No channel assignment
t4, 1 = No working channel high speed data
t3, 1 = No working channel low speed data
t2, 1 = No drop channel message (dotting)
t1, 1 = Control Channel, synthesizer, not locked
t0, 1 = Working channel, synthesizer, not locked
w4-w0, = Working channel number, in binary

This message is sent by the **TU** as the result of placing a test call which was initiated by seeing a Test Call Request Message on the outbound control channel.

Each Receiver Unit supplies a fault indicator line to the TUAI (one per channel). This line is activated low whenever the Receiving Unit decodes a Test Call Request on the BLS and its channel number matches that of the control or working channel to be used in the call. This fault condition is set back to high as the Receiving Unit, indicating "**RX Pass**" L4 off, under the following conditions:

1. In control channel mode when the channel request is seen on the RF.

2. In the working channel mode when dotting and low speed data are detected.

The TUAI uses the Call Results message along with the Receiver fault lines to determine if a channel has passed or failed the test call.

TUAI OUTPUTS

The TUAI has two types of outputs:

1. Each channel has a fault line output from the TUAI to the Alarm Reporting System (Low = Channel failed).

2. The Test Unit Fault line from TUAI to the Alarm Reporting System indicates a failure in the Test Unit Radio (Low = TU failed).
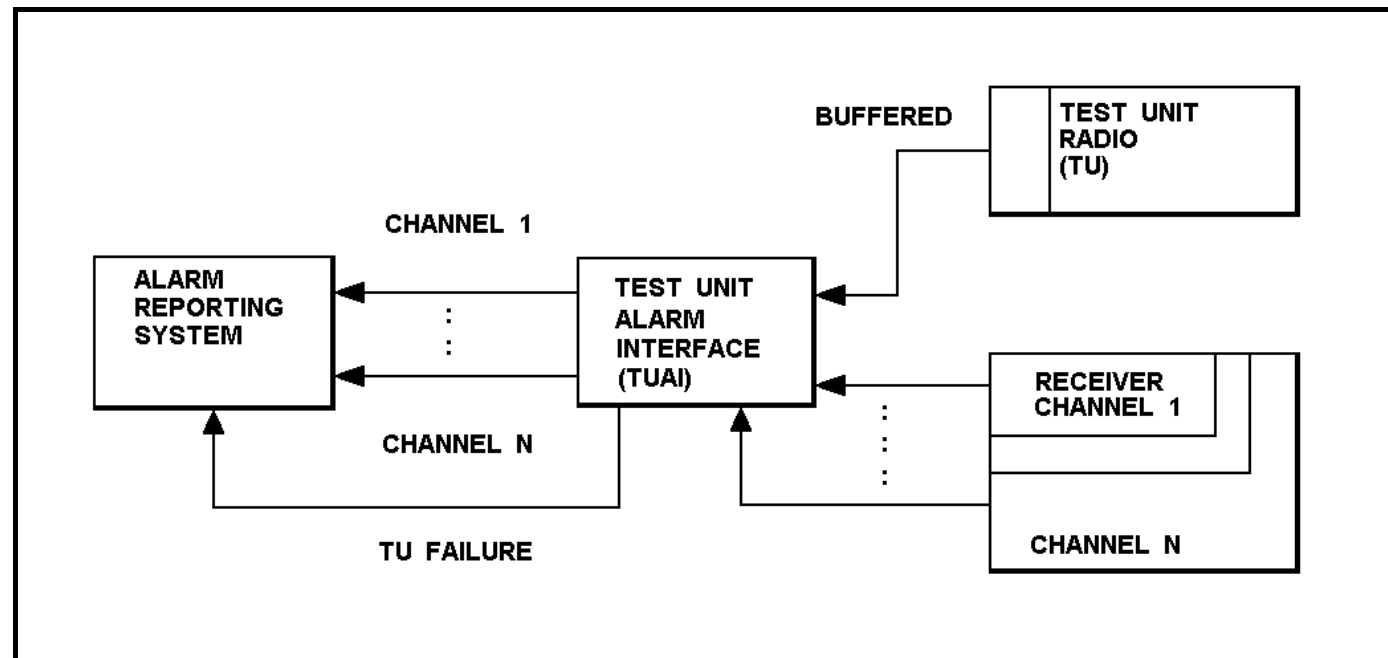
HARNESS INFORMATION FOR TUAI

INPUT HARNESS

J7-14 To TB10-01	(1st Channel)
J7-13 To TB10-02	(2nd Channel)
J7-12 To TB10-03	(3rd Channel)
J7-11 To TB10-04	(4th Channel)
J7-10 To TB10-05	(5th Channel)
J10-02 To TB10-06	(GND)
J10-01 To TB10-07	(+ 13 Vdc)
P8-06 To TB10-08	(TU serial data)

OUTPUT HARNESS

J6-14 To J100-01	(1st Channel)
J6-16 To J100-02	(2nd Channel)
J6-15 To J100-03	(3rd Channel)
J6-11 To J100-05	(4th Channel)
J6-12 To J100-05	(5th Channel)
J6-03 To J100-09	(TU Fail)

DIP SWITCH

SW1 - positions 1 - 5	Low Channel #
SW2 - positions 1 - 5	High Channel #

TEST UNIT RADIO SERIAL OUTPUT

The Test Unit Radio Serial Output is buffered by mobile buffer board 19C336920G1 (refer to Maintenance Manual LBI-38236). In this application, the **"Alarm"**, **RESET** and **ENABLE** functions are not used; only one data input is used. As the data messages, from the TU, are spaced much farther apart in time than from the Control Channel monitor, the **"RED Alarm"** LED will flicker off with each message (approximately 15/minute).

The Test Unit is a **RANGR EDACS** radio (19C891571P3) mounted in Test Unit Shelf 19D4398294.

CONTROL CHANNEL MONITOR

The Control Channel Monitor located at the satellite site is a mobile radio which monitors the outbound control-channel messages from the control site. This radio receives and validates the slotted outbound control messages. The messages are sent through the buffer board onto the serial link at 19.2 kilobaud to all satellite receiver GETC's located at the site.

The Control Channel Monitor consists of the following items (refer to Application Diagram 19D902679, Sheet 1):

ITEM	PART NUMBER
• Shelf	19D438294G1
• Radio	19C851571P3
• RF Cable	19C336946G8
• Buffer Board	19C337055G1
• Power Cable	19D438359G1
• Support (Buffer Bd.)	19C851927P1
• Factory Hardware	PL19A149898G1
• Staging Hardware	PL19A149898G2
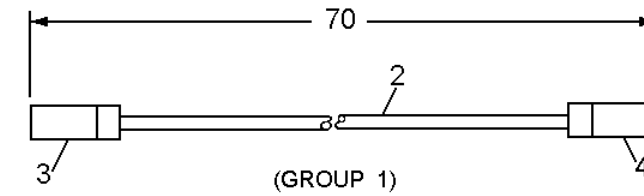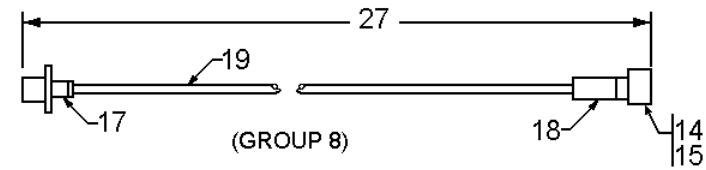
RF CABLE ASSEMBLY 19C336946G1 & G8

(19C336946, Rev. 2)
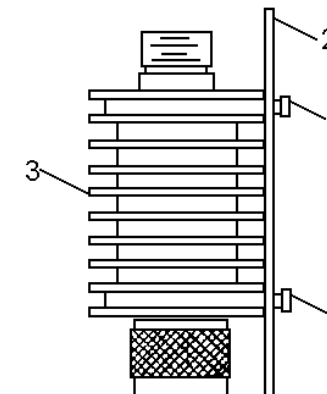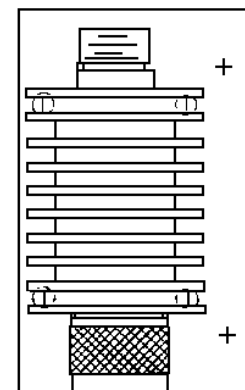
ATTENUATOR PAD

(19B234961, Rev. 0)
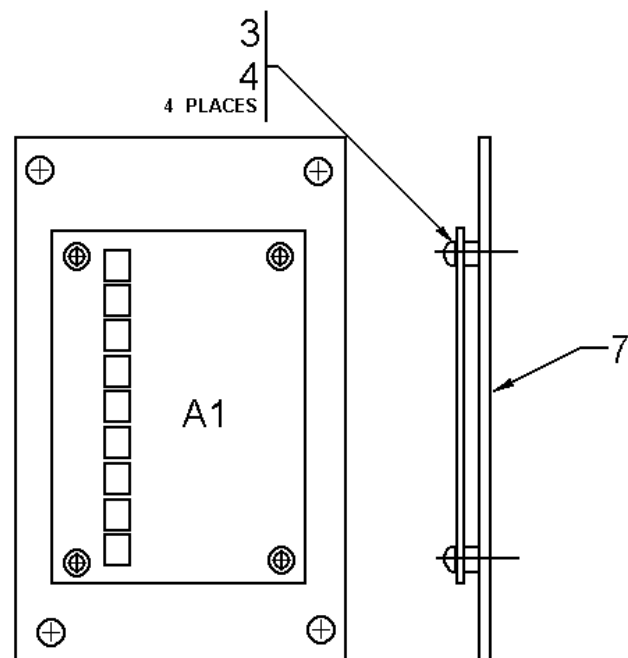
3
4
4 PLACES

A1

7

(6)

MARK G.E. DWG. & GP. NO.
PER 19A700154P1
COLOR CONTRASTING
CHARACTERS, .12 HIGH

3
4
4 PLACES

A1

2
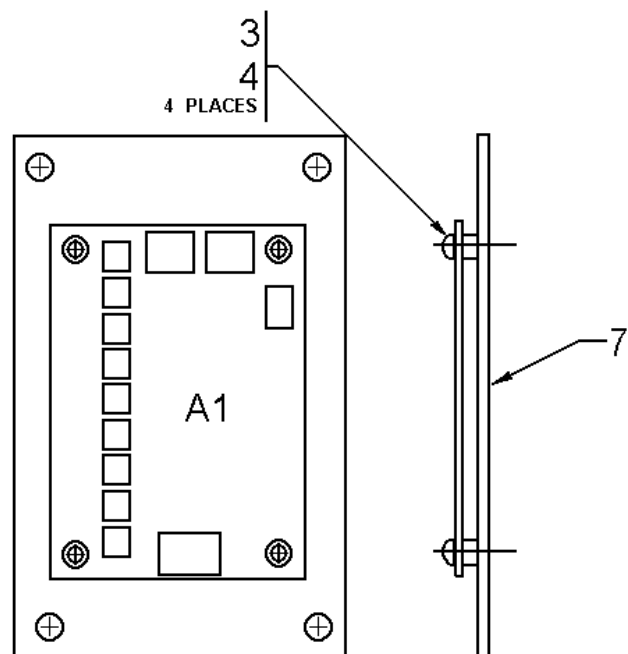
(1)

MARK G.E. DWG. & GP. NO.
PER 19A700154P1
COLOR CONTRASTING
CHARACTERS, .12 HIGH

3
4
4 PLACES

A1

7
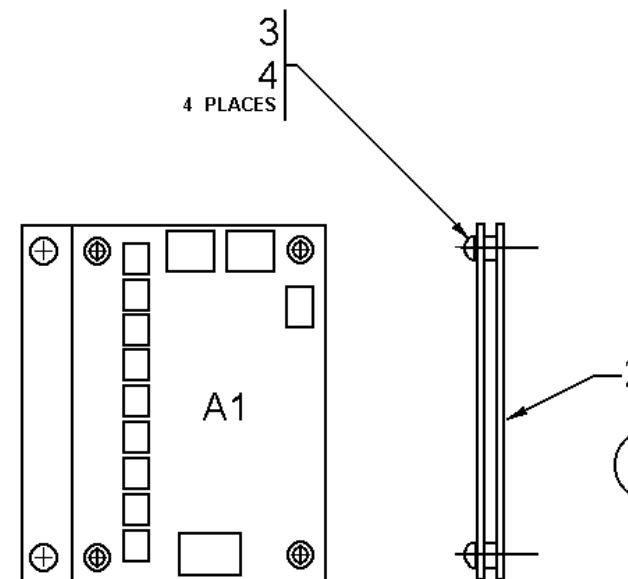
(8)

OTHERWISE SAME AS PT. 1

A1

(5)

OTHERWISE SAME AS PT. 1
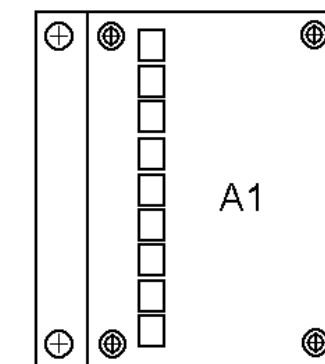
ASSEMBLY DIAGRAM
BUFFER BOARD A1

(19C337055, Rev. 1A)

V18 - R
FROM J3-1
TO +13.8 V

V18 - BK
FROM J3-4
TO GROUND

BUFFER BOARD
19C337055

HARNESS

WIRE TO 13.8 V POWER SUPPLY

⚠2

CONNECTOR
19A116659P17
CONTACT
19A116781P3
CONTACT
5496809P17

#18 WIRE SIMILAR TO
GE 19A116889P2 AND
GE 19A116889P10

J2
J1
J3
J5

POWER CABLE
TO RADIO

⚠1
SCREW
N80P15005B6
L'WASHER
N403P16B6

SUPPORT
19C851927

⚠1
SCREW
19A134011P1
SPG NUT
7160861P33

⚠1
SCREW
N80P90005B6
L'WASHER
N404P11B6
NUT
7141225P2

⚠1
TIE STRAP
(TO SHELF)
19J706152P3

POWER CABLE
19D438359G1

SECURE RADIO MOUNTING
PLACE TO SHELF USING
⚠1   SCREW
N80P21008B6
L'WASHER
N403P25B6
WASHER
N402P11B6

RF CABLE
19C336946G8

① CONTROL CHANNEL MONITOR

NOTES:

⚠1   PART OF FACTORY ASSEMBLY HARDWARE KIT 19A149898G1.

⚠2   PART OF FIELD/STAGE HARDWARE KIT 19A149898G2.

3   NO FACTORY TEST REQUIRED.

RADIO
19C851571P3

SHELF
19D438294

APPLICATION ASSEMBLY DIAGRAM
CONTROL CHANNEL MONITOR
(OPTION SCTS1C)

(19D902679, Sh. 1, Rev. 2)

V18-R
FROM J3-1
TO +13.8 V

V18-BK
FROM J3-4
TO GROUND

BUFFER BOARD
19C337055

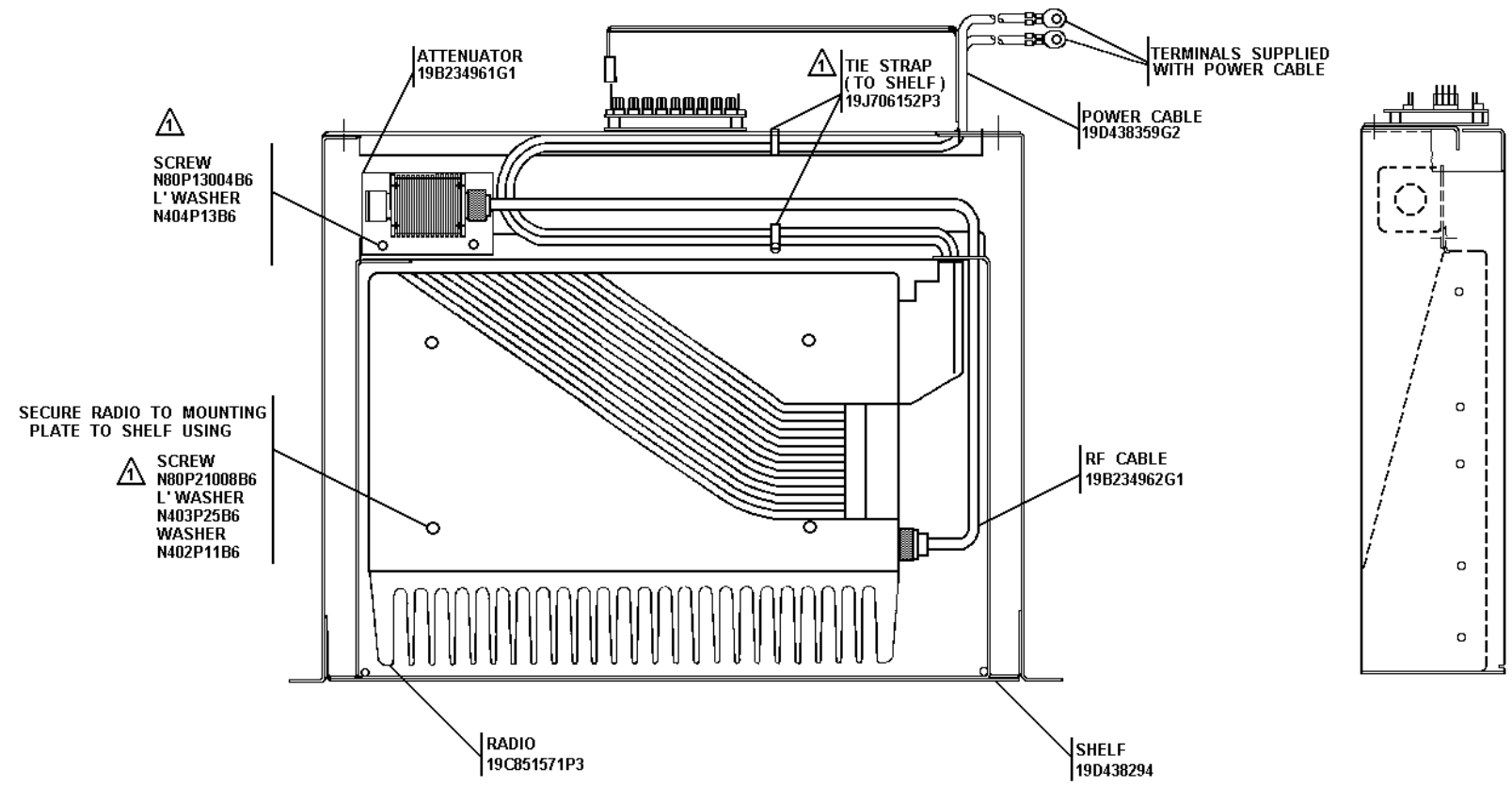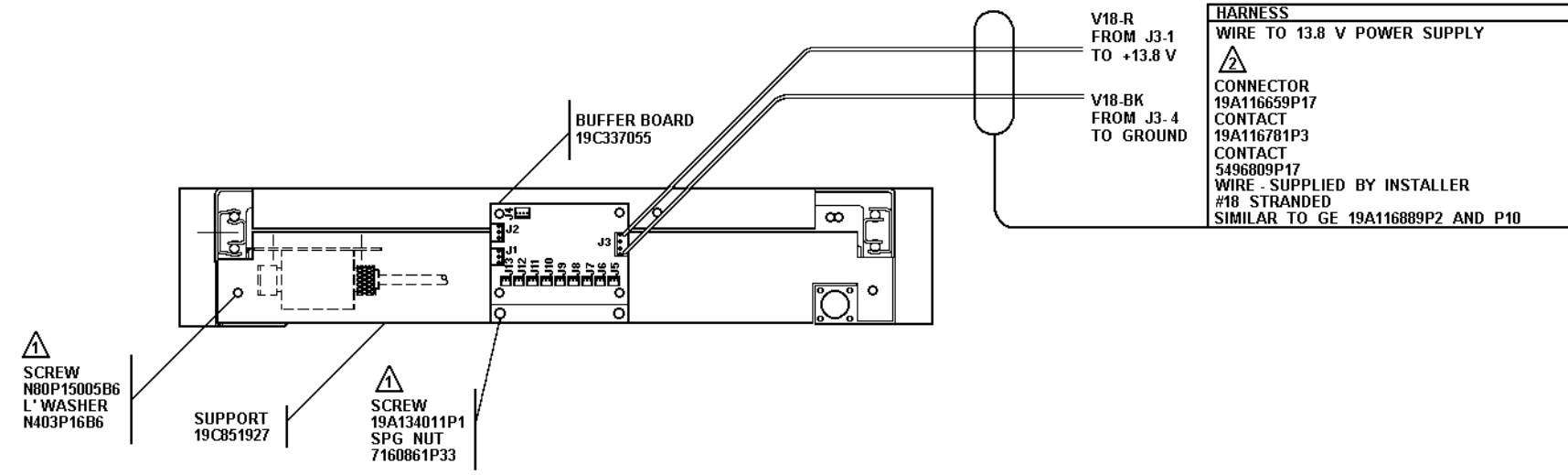| HARNESS	
WIRE TO 13.8 V POWER SUPPLY	
⚠2	
CONNECTOR	
19A116659P17	
CONTACT	
19A116781P3	
CONTACT	
5496809P17	
WIRE - SUPPLIED BY INSTALLER	
#18 STRANDED	
SIMILAR TO GE 19A116889P2 AND P10	

⚠1
SCREW
N80P15005B6
L' WASHER
N403P16B6

SUPPORT
19C851927

⚠1
SCREW
19A134011P1
SPG NUT
7160861P33

ATTENUATOR
19B234961G1

⚠1 TIE STRAP
(TO SHELF)
19J706152P3

TERMINALS SUPPLIED
WITH POWER CABLE

POWER CABLE
19D438359G2

⚠1
SCREW
N80P13004B6
L' WASHER
N404P13B6

SECURE RADIO TO MOUNTING
PLATE TO SHELF USING

⚠1 SCREW
N80P21008B6
L' WASHER
N403P25B6
WASHER
N402P11B6

RF CABLE
19B234962G1

RADIO
19C851571P3

SHELF
19D438294

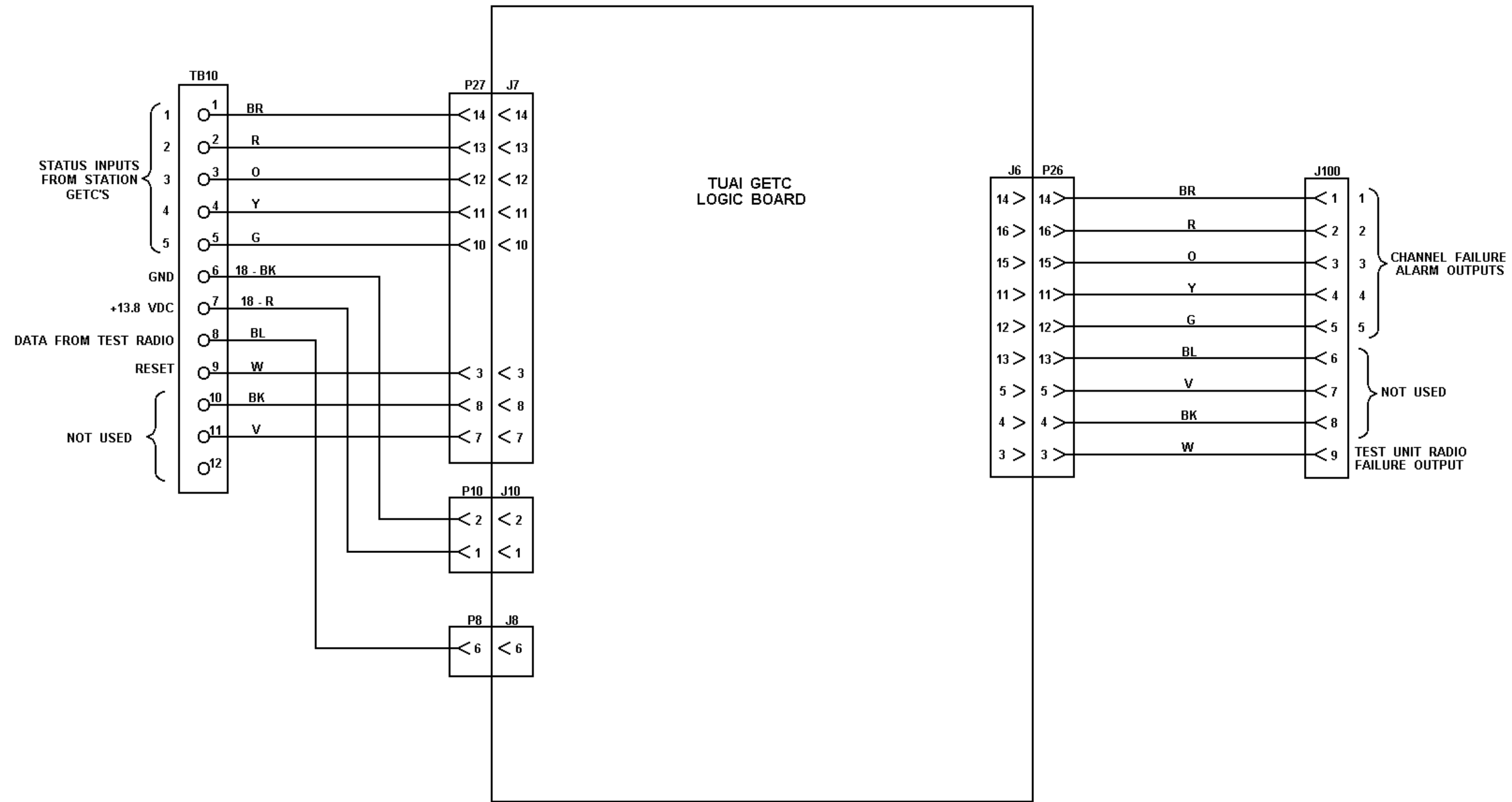② TEST UNIT

NOTES:

⚠1 PART OF FACTORY ASSEMBLY HARDWARE KIT 19A149898G3

⚠2 PART OF FIELD/STAGE HARDWARE KIT 19A149898G4

3   NO FACTORY TEST REQUIRED

APPLICATION ASSEMBLY DIAGRAM
TEST UNIT (OPTION SCTS1B)

(19D902679, Sh. 2, Rev. 2)

TB10

STATUS INPUTS FROM STATION GETC'S

1 — BR
2 — R
3 — O
4 — Y
5 — G

GND — 18 - BK
+13.8 VDC — 18 - R
DATA FROM TEST RADIO — BL
RESET — W

NOT USED
BK
V

P27 / J7

14 14
13 13
12 12
11 11
10 10

3 3
8 8
7 7

P10 / J10

2 2
1 1

P8 / J8

6 6

TUAI GETC LOGIC BOARD

J6 / P26

14 14
16 16
15 15
11 11
12 12
13 13
5 5
4 4
3 3

BR
R
O
Y
G
BL
V
BK
W

J100

1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9

CHANNEL FAILURE ALARM OUTPUTS

NOT USED

TEST UNIT RADIO FAILURE OUTPUT

NOTES:
1. SEE 19D902587 IN LBI-38585 FOR APPLICATION ASSEMBLY DETAILS.

SIMULCAST TUAI GETC

(19D903822, Sh. 3, Rev. 2)

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