



# Transfer-Trip Manual Test Panels

## Test Equipment and Accessories

GE Protective Relays

### Single Channel Unidirectional

#### TRANSMITTER TEST PANEL

This test panel consists of a transmitter test switch which is a two position, two stage SB-1 switch with a locking handle.

**"Normal"** position of the switch permits keying from the protective relay input.

**"Off"** position is available for connection to local station annunciator/alarm equipment; and a contact closes to indicate the switch is in an off/normal position.

**"Trip"** position keys the channel transmitter from guard frequency to trip frequency, which is sent to the remote terminal. Again, contact 4 is closed to annunciate an off/normal switch position.

This unit can be used with Type 40 and 51/61/71 channel equipment (see LBI-28025).

This test panel is 3 RU high.

- 19B218627G1 . . . . . Transmitter Panel
- 19B218627G2 . . . . . Receiver Panel ( 48 VDC)
- 19B218627G4 . . . . . Receiver Panel (125 VDC)
- 19B218627G5 . . . . . Receiver Panel (250 VDC)

#### RECEIVER TEST PANEL

This test panel consists of a receiver test switch which is a three position, three stage SB-1 switch with a small pistol-grip handle.

**"Normal"** position permits high speed operation of an auxiliary relay or single breaker trip circuit. Also, an associated red indicating lamp (guard) is illuminated while the remote transmitter is sending guard frequency.

**"Test"** position the trip or auxiliary output is disabled and a contact closes to indicate the off / normal switch position. The remote transmitter switch may now be turned to the trip position. The red (guard) indicating lamp will extinguish and the amber (trip) lamp will illuminate, indicating receipt of trip frequency.

**"Off"** switch position removes the receiver channel from service.

19B218627G2 is for 48 VDC operation.

19B218627G4 is for 125 VDC operation.

19B218627G5 is for 250 VDC operation.

In summary, this unit consists of an SB-1 switch and two indicating lamps and can be used with Type 40 and 51/61 channel equipments. Its use with Type 71 requires a relay output in the receiver (see LBI-28025).

This test panel is 3 RU high.



### Single Channel Bidirectional

#### TRANSMITTER/RECEIVER TEST PANELS

This test panel consists of two-three position test switches, both SB-1 types. The transmitter switch is designated (TSS). The receiver switch is designated (TSR).

The (TSS) switch operates as follows :

**"Normal"** position permits keying from the protective relay input.

**"Off"** position is available for connection to a local station annunciator / alarm circuit; and, an additional contact closes to indicate the off normal switch position.

**"Trip"** position keys the channel transmitter from guard to trip frequency which is sent to the remote terminal. Again a contact closes to indicate the off normal switch position.

The (TSR) switch operates as follows :

**"Normal"** position permits high speed operation of an auxiliary relay or single breaker trip circuit. Also, an associated red indicating lamp (guard) is illuminated while the remote transmitter is sending guard frequency.

**"Test"** position disables the trip or auxiliary output and also indicates the off normal switch position. When the remote transmitter is keyed to the trip position, the red (guard) lamp will extinguish and the amber (trip) lamp will illuminate indicating receipt of trip frequency.

**"Off"** position removes the receiver channel from service.

Group 3 is for 48 VDC operation.

Group 6 is for 125 VDC operation.

Group 7 is for 250 VDC operation.

This unit can be used with Type 40, 51/61 channel equipment. Its use with Type 71 channel will require a relay output in the receiver (see LBI-28025).

This test panel is 3RU high.

19B218627G3 . . . . . Transmitter/Receiver Panel ( 48 VDC)

19B218627G6 . . . . . Transmitter/Receiver Panel (125 VDC)

19B218627G7 . . . . . Transmitter/Receiver Panel (250 VDC)



#### Test Equipment and Accessories



# Transfer-Trip Manual Test Panels

## Test Equipment and Accessories

GE Protective Relays

### Dual Channel Unidirectional

#### TRANSMITTER TEST PANEL

This test panel consists of a four position SB-10 transmitter test switch capable of testing each transmitter individually.

The switch operates in the following manner :

**"Normal"** position permits simultaneous transmitter keying from the protective relay input.

**"Test 1"** position with switch pulled out removes keying from the protective relay and provides local keying to transmitter one only.

**"Test 2"** position with switch pulled out removes keying from the protective relay and provides local keying to transmitter two only.

Note: When the switch is in the "test" position but not pulled out, the corresponding transmitter is disabled.

The test panel is 3 RU high.

This unit can be used with Type 40 and 51/61/71 channel equipment (see LBI-28894).

- 19D425097G1 . . . . . Transmitter Panel
- 19D425078G1 . . . . . Receiver Panel ( 48 VDC)
- 19D425078G2 . . . . . Receiver Panel (125 VDC)
- 19D425078G3 . . . . . Receiver Panel (250 VDC)
- 19D427218G5 . . . . . Receiver Panel with auto throwover to single channel operation with heavy duty trip relay multiplier (125 VDC)
- 19D425078G10 M2 . . . . Same as 078G1-3 plus aux. relay

#### RECEIVER TEST PANEL

This dual receiver auxiliary test panel contains two Type SB-1 receiver test switches with two sets of guard/trip and loss of signal indication lamps.

The panel has the capability to test dual channel equipment on a per channel basis while "in service" (see LBI-28702, functional diagram 19D425031).

The receiver test switches are three-position, three-state type SB-1 switches. These switches operate as follows :

**"Normal"** position the switch permits high speed operation of an auxiliary relay or breaker trip circuit. The associated red indicating lamps (guard and LOS) are illuminated while the remote transmitter is sending guard frequency.

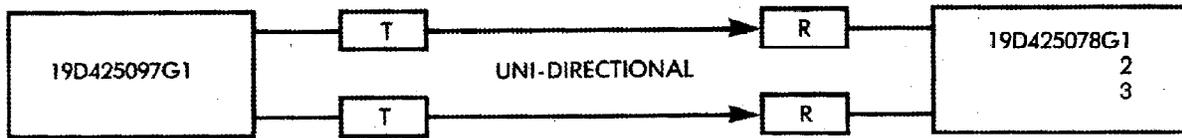
**"Off"** position the trip or auxiliary relay outputs, guard and loss of signal alarms are disabled.

**"Test"** position allows receipt of a remote trip indication.

This panel is applicable to Type 40 tone and Type 51/61/71 carrier equipment.

Its use with Type 71 requires a relay output in the receiver (see LBI-28702).

The panel requires 3 rack units of mounting space.



### Dual Channel Bidirectional

#### TRANSMITTER/RECEIVER TEST PANELS

This is a dual channel scheme used with equipment protection relaying systems. Manual testing of either channel or both channels can be accomplished. The panel also displays individual channel trip and guard alarms.

The panel contains three test switches : A 6 position TSS switch for use with the transmitters and two — four position TSR switches for use with each receiver channel. The panel also contains two target relays, trip coils and seal in relays, one for each channel and additional auxiliaries to power the display lamps, etc.

The transmitter switch (TSS) operates as follows :

**"Normal"** position allows keying voltage to be applied to both transmitters.

**"Test 1 or 2"** position allows the associated transmitter under test to be disconnected. By pulling out the switch handle keys the associated transmitter to trip.

**"Off"** position disables the keying capability.

The receiver test switches TSR1 and 2 each operate as follows:

**"Normal"** position allows each receiver to operate the trip circuit if a valid trip signal is received.

**"Test"** position disables the associated receiver from the trip circuit, thus allowing the channel to be tested without sending an alarm condition. During this test, the second channel can still receive a valid trip signal and perform the normal transfer-trip function.

**"Off"** position completely disables the trip circuits.

#### ADDITIONAL FEATURES PER SPECIFIC GROUP

Group	Voltage	Reference	(CCS)	(CSS)	(Counters)	(Throwover)
1	125VDC	LBI-34643	No	Yes	No	No
2	125VDC	LBI-34733	No	Yes	Yes	No
3	125VDC	LBI-35164	Yes	Yes	Yes	No
4	125VDC	LBI-35630	No	Yes	Yes	Yes
5	125VDC	IBI-36221	No	No	Yes	No

#### Legion

CCS - Channel cut off switch

CCS - Channel select switch

Counter - Counter each transmitter and receiver trips

Throwover - revert to single channel operation on prolonged loss of either channels' Guard Signal

This test panel is applicable to Type 40 and Types 51, 61, and 71 equipment.

This panel is 15 RU high.

## Test Equipment and Accessories



# Transfer - Trip Manual Test Panels

## Test Equipment and Accessories

GE Protective Relays

### Dual Channel Bidirectional (cont'd)

- 19D427804G1. . . . . Transmitter/Receiver Panel with targets, trip coils, seal in relay, Channel Select switch (125 VDC)
- 19D427804G2. . . . . Same as G1 but with transmit and receive counters (125 VDC)
- 19D427804G3. . . . . Same as G2 but with channel cut-off switch
- 19D427804G4. . . . . Same as G2 but with automatic throwover to single channel
- 19D427804G5. . . . . Same as G2 except less carrier select switch

### TRANSMITTER / RECEIVERS WITH AUTOMATIC THROVOVER TO SINGLE CHANNEL

This is a dual channel scheme providing automatic throwover to single channel upon sustained loss of either channel. The automatic throwover to single channel operation following sustained loss of either channel improves the dependability of the scheme (equipment protection) by preventing complete loss of protection following permanent failure of one of the channels. Failure (or test) of both channels simultaneously will inhibit a trip.

This panel contains one-six position transmitter test switch (TSS) and two-four position receiver test switches TSR1 and TSR2 along with associated trip and channel indicating lamps. The panel also contains a K1 and a K2 relay.

The transmitter test switch TSS operates as follows :

- "Normal" position allows keying voltage to be applied to both transmitters.
- "Test 1 or 2" position allows the associated transmitter under test to be disconnected. Also, by pulling out the switch handle; it keys the associated transmitter to trip.
- "Off" position disables the keying capability.

The receiver test switches TER 1 and 2 each operate as follows:

- "Normal" position allows each receiver to operate the trip circuit if a valid trip signal is received.
- "Test" position disables the associated receiver from the trip circuit, thus allowing the channel to be tested without sending an alarm condition. During this test, the second channel can still receive a valid trip signal and perform the normal transfer - trip function.
- "Off" position performs the same function as the "test" position.

The K1 relay (NAA27) provides:

1. Automatic throwover to single channel operation
2. Trip circuit target seal-in relay
3. Auxiliary relays for indication and alarm
4. Auxiliary relay for blocking reclosing circuits

The K2 relay (HFA51A) provides additional heavy duty trip contacts.

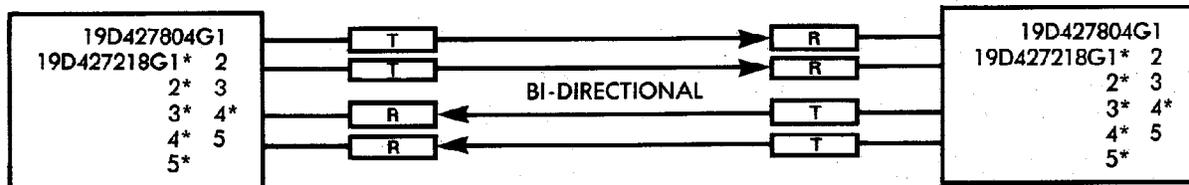
- Group 1 is for 48 VDC operation
- Group 2 is for 125 VDC operation
- Group 3 is for 48 VDC operation without the K2 (HFA51A) relay
- Group 4 is for 125 VDC operation without the K2 (HFA51A) relay
- Group 5 is for 125 VDC operation (Same as G2 except receive end only 'less TSS switch'), see page 12-12

Note : This panel is applicable to Type 40 and also to Type 51/61/71 with the deletion of the squelch alarm.

This test panel is 11 RU high.

#### (Automatic throwover to signal channel operation)

- 19D427218G1. . . . Transmitter / Receiver panel with heavy duty trip relay multiplier ( 48 VDC)
- 19D427218G2. . . Transmitter / Receiver panel with heavy duty trip relay multiplier ( 125 VDC)
- 19D427218G3. . . Transmitter/Receiver panel without heavy duty trip relay multiplier (48 VDC)
- 19D427218G1. . . Transmitter/Receiver panel without heavy duty trip relay multiplier (125 VDC)



\*Auto Throwover



# Transfer-Trip Manual Test Panels

Test Equipment and Accessories

GE Protective Relays

## Shared Function Channel

### BIDIRECTIONAL (MAY REQUIRE A COMBINER SHELF)

This test panel is used with shared functions relaying scheme such as line relaying and direct transferred trip (both channels keyed simultaneously). The panel is used with Type 40, 61 and 71 channel equipment. It will permit manual test of either channel with automatic turn around. The functions included are :

1. Initiating and receiving test trips
2. Local test firing of the SCR's
3. Displaying Channel Status :  
Channel Failure  
Trip  
Lockout
4. Count of individual events :  
Channel 1 Trip  
Channel 2 Trip  
Combined Trip
5. Inhibit the Trip Circuits when on SCR Test
6. Independent targeting of trip channels,  
breaker failure initiate, reclose initiate  
and reclose hold contacts are available.

This test is 11 rack units high.

Note : This panel normally requires an external combiner shelf (19A113604) which provides the SCR's and various keying relays.

Please refer to LBI-34350.

19D427215G1 . . . . . Transmitter/Receiver panel ( 48 VDC)  
 19D427215G2 . . . . . Transmitter/Receiver panel (125 VDC)  
 19D427215G3 . . . . . Transmitter/Receiver panel ( 48 VDC)  
 supplied by combiner isolated supply

