# DIGITAL CLOCK DISTRIBUTOR

# 519

# INTERCONNECT DRAWINGS

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Tables

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## 1. GENERAL

**1.01** This section provides interconnect wiring diagrams of Symmetricom's Digital Clock Distributor 519 (DCD-519) System.

**1.02** This section is reissued for the reasons listed below. Changes and additions are marked with change bars.

- Replaced 1-1 with 1:1 (redundant protection) throughout document. (Changes not marked.)
- Engineering Note #18 was replaced by Engineering Note #23.
- Table N was replaced by Table T.
- Table P was replaced by Table U.
- Table Q was replaced by Table V.
- Figure 40 was replaced by Figure 54.
- Figure 44 was replaced by Figure 55.
- Figure 45 was replaced by Figure 56.
- Figure 46 was replaced by Figure 57.
- Figure 48 was replaced by Figure 58.
- Figure 49 was replaced by Figure 59.
- Figure 50 was replaced by Figure 60.

TABLE A.
FEATURE TABLE

| FIGURE | REMARKS |
|---|---|
| 1 | FURNISH 1 PER RACK MOUNTED SHELF FOR A AND B LOADS. |
| 1A | FURNISH 1 PER CABINET MOUNTED SHELF FOR A AND B LOADS. (Manufacturing discontinued) |
| 2 | FURNISH 1 PER 4-SHELF ARRANGEMENT. |
| 3, 4 | FURNISH 1 PER SHELF. |
| 5, 6 | FURNISH 1 PER 4-SHELF ARRANGEMENT TO MASTER SHELF. |
| 7 | FURNISH 1 PER EXPANSION SHELF. |
| 8, 9, 10 | FURNISH 1 PER 4-SHELF ARRANGEMENT TO MASTER SHELF, AS REQUIRED. |
| 11 | FURNISH 1 PER 4-SHELF ARRANGEMENT WHEN MULTIPLE REFERENCE INPUTS ARE REQUIRED (INPUT A). |
| 12 | FURNISH 1 PER 4-SHELF ARRANGEMENT WHEN MULTIPLE REFERENCE INPUTS ARE REQUIRED (INPUT B). |
| 13 | FURNISH 1 PER 4-SHELF ARRANGEMENT WHEN SINGLE REFERENCE E1/DS1 OR COMPOSITE CLOCK INPUT IS REQUIRED FOR INPUT A. |
| 14 | FURNISH 1 PER 4-SHELF ARRANGEMENT WHEN SINGLE REFERENCE E1/DS1 OR COMPOSITE CLOCK INPUT IS REQUIRED FOR INPUT B. |

TABLE A. (CONT'D)
FEATURE TABLE

| FIGURE | REMARKS |
|---|---|
| 15 | FURNISH 1 PER 4-SHELF ARRANGEMENT WHEN ANALOG CLOCK INPUT IS REFERENCE SOURCE (INPUT A). |
| 16 | FURNISH 1 PER 4-SHELF ARRANGEMENT WHEN ANALOG CLOCK INPUT IS REFERENCE SOURCE (INPUT B). |
| 17 | FURNISH 1 PER 4-SHELF ARRANGEMENT WHEN DCD-LPR SHELF IS PROVIDED. |
| 18 | FURNISH 1 PER WIRE-WRAP OUTPUT MODULE. |
| 19 | FURNISH 1 PER 2-PORT BNC OUTPUT MODULE. |
| 20 | FURNISH 1 PER SCIU OUTPUT MODULE. |
| 21 | FURNISH 1 PER ESCIU OUTPUT MODULE. |
| 22 | FURNISH 1 PER SMB OR SIEMENS CONNECTOR OUTPUT MODULE. |
| 23 | FURNISH 1 PER OUTPUT CARD PROVIDED |
| 24 | FURNISH 1 PER CLOCK INPUT CARD PROVIDED |
| 25 | FURNISH 1 PER PSM CARD PROVIDED |
| 26, 42, 43 | FURNISH ONE MASTER INTERFACE PANEL PER MASTER SHELF IF ALL OUTPUTS ARE UNPROTECTED; THIS IS NOT A RECOMMENDED CONFIGURATION. |
| 27, 42, 43 | FURNISH TWO INTERFACE PANELS PER EXPANSION SHELF IF ALL OUTPUTS ARE UNPROTECTED; THIS IS NOT A RECOMMENDED CONFIGURATION. |
| 28, 29 | FURNISH 1 PER MASTER SHELF, AS REQUIRED. |
| 30, 31 | FURNISH 1 PER EXPANSION SHELF, AS REQUIRED. |
| 32 | FURNISH 1 PER 4-SHELF ARRANGEMENT, AS REQUIRED. |
| 33 | FURNISH 1 IF CONNECTED TO A DCD-LPR SYSTEM. |

ENGINEERING NOTES:

1. CONNECTIONS TO TB1 AND TB2 SHOULD BE MADE USING SPADE TERMINALS OR RING TERMINALS TO FIT THE #6 SCREW.

2. MULTIPLE ONLY STATUS/CONTROL LEADS MINSI, MAJSI, CRTSI, PRTA, AND BATTALM FROM FIGURE 4 TO OTHER SHELVES.

3. STATUS/CONTROL LEADS ARE OFFICE ASSIGNABLE AT TELEMETRY END BY CENTRAL OFFICE ENGINEER.

4. SET SW4 AND SW5 (BRIDGE/TERM) TO ONE OF THE FOLLOWING:

   - SET TO BRIDGE WHEN CONNECTING –20 dB DDF E1/DS1 REFERENCE SIGNALS TO TB12 AND TB13. ALL INPUT SIGNALS TO EITHER TB12 OR TB13 MUST BE AT THE SAME LEVEL (AMPLITUDE).
   - SET TO TERM WHEN CONNECTING –0 dB DDF E1/DS1 REFERENCE SIGNALS. ALL INPUT SIGNALS TO EITHER TB12 OR TB13 MUST BE AT THE SAME LEVEL (AMPLITUDE).
   - SET TO BRIDGE WHEN CONNECTING –20 dB DDF E1/DS1 REFERENCE SIGNALS TO TB12 AND TB13. ALL INPUT SIGNALS TO EITHER TB12 OR TB13 MUST BE AT THE SAME LEVEL (AMPLITUDE).
   - SET SW4 AND SW5 TO TERM WHEN CONNECTING –0 dB DDF E1/DS1 REFERENCE SIGNALS. ALL INPUT SIGNALS TO EITHER TB12 OR TB13 MUST BE AT THE SAME LEVEL (AMPLITUDE).

5. THE “S” LEADS ON TB12 AND TB13 ARE INTERNALLY CONNECTED TO FRAME GROUND, THEREFORE, THE SHIELD OF THE INPUT CABLES MUST BE EITHER TERMINATED TO THE “S” TERM AT TB12 AND TB13 OR TO FRAME GROUND AT THE SIGNAL ORIGINATION END, I.E., DDF, BUT NEVER AT BOTH; ONE END OF THE SHIELD *MUST* BE OPEN (NOT CONNECTED). (This note is manufacturing discontinued; see Engineering Note #22.)

6. PROVIDE MODEM CIRCUIT, PACKET SWITCH CIRCUIT, OR PRIVATE LINE CIRCUIT FROM THE CENTRALIZED ALARM AND SURVEILLANCE CENTER FOR CONNECTION TO COM2 DB9 FEMALE CONNECTOR WHEN MIS CARD IS PROVIDED.

7. TWO COAXIAL CABLES WITH BNC CONNECTORS AT BOTH ENDS ARE PROVIDED BY SYMMETRICOM WHEN DCD-LPR SHELF IS PROVIDED. THESE CABLES CONNECT COLLOCATED DCD-LPR AND DCD SHELVES (IF LOCATED WITHIN 1.8 m (6.0 ft) OF EACH OTHER). IF SHELVES ARE LOCATED AT A DISTANCE >1.8 m (>6.0 ft), LONGER CABLES ARE REQUIRED (USER-SUPPLIED). CONNECT J44 TO J11 (AT DCD-LPR) AND J45 TO J12 (AT DCD-LPR).

8. E1/DS1 REFERENCE SHOULD BE TRACEABLE TO A G.811 CLOCK (STRATUM-1) PRIMARY REFERENCE SOURCE (PRS).

9. THE 422 ¾ 1/4 W RESISTORS PROVIDED BY SYMMETRICOM MAY BE USED FOR THE 432 ¾ SHOWN IN FIGURES.

10. IF SHIELD IS GROUNDED AT THE NETWORK ELEMENT (NE) END, E.G., SWITCH OR DACS, DO NOT CONNECT THE “S” LEAD (DC FRAME GROUND). CONNECT SHIELD TO DC FRAME GROUND ON ONE END OF CABLE ONLY. NORMALLY, GROUND AT THE SIGNAL SOURCE (DCD S LEAD).

11. WARN AND WARN RTN SHOULD NOT BE CONNECTED. THERE IS NO WAY TO RESET OR CLEAR THIS ALARM.

ENGINEERING NOTES (CONTD):

12. THE MASTER SHELF INTERFACE PANEL MAY BE EQUIPPED WITH UP TO 6 OUTPUT MODULES AND 2 INPUT MODULES. THE EXPANSION SHELF INTERFACE PANEL MAY BE EQUIPPED WITH UP TO 8 OUTPUT MODULES. EACH OUTPUT MODULE CORRESPONDS TO A TIMING OUTPUT SLOT (TOx) IN THE DCD SHELF. EACH INPUT MODULE CORRESPONDS TO A CLOCK INPUT SLOT (MRA AND MRB) IN THE DCD SHELF. REFER TO TABLE B FOR THE SPECIFIC MODULE TYPE TO BE USED WITH EACH CARD.

13. PROVIDE ONE FIGURE 23 FOR EACH TO, ESCIU, or SCIU CARD.

14. BLANK PLUG-INS (P/N 090-45098-01) ARE RECOMMENDED FOR UNUSED EQUIPMENT SLOTS. ON THE MASTER SHELF, PROVIDE THREE BLANK PLUG-INS, INSTALLED BETWEEN ST A AND ST B SLOTS, WHEN TNC OR LNC CLOCK CARDS ARE USED. ON THE EXPANSION SHELVES, PROVIDE ONE P/N 090-45098-01 BLANK PLUG-IN FOR EACH MON SLOT. ON THE MASTER AND EXPANSION SHELVES, PROVIDE TWO BLANK PLUG-INS FOR EACH UNUSED MR SLOT, AND ONE P/N 090-45098-01 BLANK PLUG-IN FOR EACH UNUSED OUTPUT SLOT.

15. IF THE SHELF IS EQUIPPED WITH TWO TNC-E OR ST2E CLOCK CARDS, OUTPUT SLOTS TO1, TO2, AND TO3 ARE OCCUPIED BY THE TNC-E OR ST2E B CLOCK CARD AND CANNOT BE USED BY OUTPUT CARDS.

    **NOTE:** THE ENHANCED TRANSIT NODE CLOCK (TNC-E) CARD AND THE ENHANCED STRATUM-2 (ST2E) CLOCK CARD ARE IDENTICAL IN SPECIFICATIONS, FUNCTIONS, CONTROLS AND INDICATORS, AND ACCEPTANCE TEST PROCEDURES. THE TNC-E NAME USES ITU STANDARD TERMINOLOGY; THE ST2E NAME USES ANSI STANDARD TERMINOLOGY. THE TNC-E AND ST2E ARE INTERCHANGEABLE.

16. CONNECT FRAME GROUND TO TB1 AND TB2 USING 50.8 mils, 1.20 mm (16 AWG) STRANDED WIRE.

17. FOR MONITORING APPLICATIONS, THE ESCIU/SCIU A-IN MAY BE CONNECTED VIA A HIGH-IMPEDANCE INTERFACE (432 ¾) TO THE FACILITY TO BE MONITORED AT THE DDF. THE ESCIU/SCIU MAY BE UP TO 198 m (655 ft) FROM THE DDF.

18. PSM CARDS MAY BE INSTALLED IN ANY TWO ADJACENT TO SLOT COMBINATIONS IN THE MASTER SHELF (WITH THE EXCEPTION OF TO3/TO4 and TO6/TO7), AND ANY TWO ADJACENT TO SLOT COMBINATIONS IN AN EXPANSION SHELF (WITH THE EXCEPTION OF TO6/TO7). IF TWO TNC-E OR ST2E CARDS ARE INSTALLED, SLOTS TO1, TO2, AND TO3 ARE NOT AVAILABLE. DO NOT PLACE IN ANY HS (IN MASTER OR EXPANSION) OR MON (IN EXPANSION SHELF ONLY) SLOT. (Manufacturing Discontinued—See Engineering Note 23.)

19. SIEMENS 1.6/5.6 CONNECTOR OUTPUT MODULE (990-45105-03) AND SIEMENS 1.0/2.3 CONNECTOR REFERENCE INPUT MODULE (990-45105-04) ARE IDENTICAL; THE DIFFERENCE LIES IN THE CONNECTOR SIZE. (Manufacturing Discontinued.)

20. SIEMENS 1.6/5.6 CONNECTOR REFERENCE INPUT MODULE (990-45107-03) AND SIEMENS 1.0/2.3 CONNECTOR REFERENCE INPUT MODULE (990-45107-04) ARE IDENTICAL; THE DIFFERENCE LIES IN THE CONNECTOR SIZE.

21. THE LPRS CONNECTOR ON THE MASTER (J48) AND EXPANSION SHELF (J21) IS USED IF COMMUNICATION BETWEEN THE MIS CARD IN THE DCD SHELF AND THE DCD-LPR IS DESIRED.

22. THE “S” LEADS ON TB12 AND TB13 ARE INTERNALLY CONNECTED TO FRAME GROUND THROUGH A CAPACITOR.

ENGINEERING NOTES (CONTD):

23. PSM CARDS MAY BE INSTALLED IN ANY TWO ADJACENT TO SLOT COMBINATIONS IN THE MASTER SHELF (WITH THE EXCEPTION OF TO3/TO4 and TO6/TO7), AND ANY TWO ADJACENT TO SLOT COMBINATIONS IN AN EXPANSION SHELF (WITH THE EXCEPTION OF TO6/TO7). IF TWO TNC-E OR ST2E CARDS ARE INSTALLED, SLOTS TO1, TO2, AND TO3 ARE NOT AVAILABLE. DO NOT PLACE IN ANY HS (IN MASTER OR EXPANSION) SLOT.

TABLE B.
INTERFACE MODULES
(Manufacturing Discontinued—See Tables N, O, P, and Q)

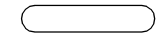
| MODULE | PART NUMBER | USED WITH |
|---|---|---|
| OUTPUT MODULES | | |
| SMB (FEMALE) CONNECTOR | 990-45105-02 | TOEA, TO-EA, and TOGA |
| SIEMENS 1.6/5.6 (FEMALE) | 990-45105-03 | TOEA, TO-EA, and TOGA |
| SIEMENS 1.0/2.3 (FEMALE) | 990-45105-04 | TOEA, TO-EA, and TOGA |
| WIRE-WRAP PINS | 990-45105-06 | TOCA, TOTA, TOTA-2, and TOLA |
| SMB (FEMALE) | 990-45021-11 | ESCIU/SCIU |
| WIRE-WRAP PINS | 990-45021-10 | SCIU |
| 2-PORT BNC | 990-45122-01 | TOAA ONLY |

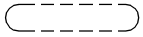
TABLE B. (CONT'D)
INTERFACE MODULES
(Manufacturing Discontinued—See Tables N, O, P, and Q)

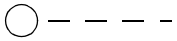
| MODULE | PART NUMBER | USED WITH |
|---|---|---|
| REFERENCE INPUT MODULES | | |
| SMB Connector Ref. Input Module, 75 ¾ (unbalanced), bridged or terminated into 0 dB to –24 dB input signal level range; terminated into 0 dB to –20 dB input signal level range | 990-45104-05 | MRC-E, MRC-EA, ECI, ACI, CI-EA |
| Wire-wrap Connector Input Module, bridged, 120 ¾ (balanced), bridged or terminated into 0 dB to –24 dB input signal level range; terminated into 0 dB to –20 dB input signal level range | 990-45104-08 | MRC-E, MRC-EA, MRC-T, ECI, ACI, CI-EA, CI |
| Siemens 1.6/5.6 (female) Connector Ref. Input Module, 75 ¾ (unbalanced), bridged or terminated into 0 dB to –24 dB input signal level range; terminated into 0 dB to –20 dB input signal level range | 990-45104-12 | MRC-E, MRC-EA, ECI, ACI, CI-EA |
| SMB (female) Connector Ref. Input Module, 75 ¾ (unbalanced), bridged or terminated into 0 dB to –24 dB input signal level range; terminated into 0 dB to –20 dB input signal level range | 990-45107-02 | MRC-E, MRC-EA, ECI, ACI, CI-EA |
| Siemens 1.6/5.6 (female) Connector Ref. Input Module, 75 ¾ (unbalanced), bridged or terminated into 0 dB to –24 dB input signal level range; terminated into 0 dB to –20 dB input signal level range | 990-45107-03 | MRC-E, MRC-EA, ECI, ACI, CI-EA |
| Siemens 1.0/2.3 (female) Connector Ref. Input Module, 75 ¾ (unbalanced), bridged or terminated into 0 dB to –24 dB input signal level range; terminated into 0 dB to –20 dB input signal level range | 990-45107-04 | MRC-E, MRC-EA, ECI, ACI, CI-EA |
| Wire-wrap Connector Input Module, bridged, 120 ¾ (balanced), bridged or terminated into 0 dB to –24 dB input signal level range; terminated into 0 dB to –20 dB input signal level range | 990-45107-06 | MRC-E, MRC-EA, MRC-T, ECI, ACI, CI-EA, CI |
| PSM INPUT MODULES | | |
| Wire-wrap Connector Module, Bridged, 120 ¾ (balanced) | 990-45106-01 | PSM-E, PSM-EA, PSM-T |
| Siemens 1.6/5.6 Connector (female) Module, Bridged, 75 ¾ (unbalanced) | 990-45106-02 | PSM-E, PSM-EA |
| BNC Connector (female) Module, Bridged, 75 ¾ (unbalanced) | 990-45106-03 | PSM-E, PSM-EA |
| SMB Connector (female) Module, Bridged or terminated, 75 ¾ (unbalanced) | 990-45106-04 | PSM-E, PSM-EA |

NOTES:

1. DRAWING CONVENTIONS


CABLE


SHIELD CONNECTION


COAX SHIELD CONNECTION


OPTIONS


SCREW CONNECTION


SPLICE OR BRIDGE POINT

0 WIRE-WRAP CONNECTION

P PAIR

B BASE OF TERMINAL BLOCK

E ADJACENT ROWS OF TERMINAL BLOCKS

K FRONT OF TERMINAL BLOCK

2W 2W CROSS-CONNECTION

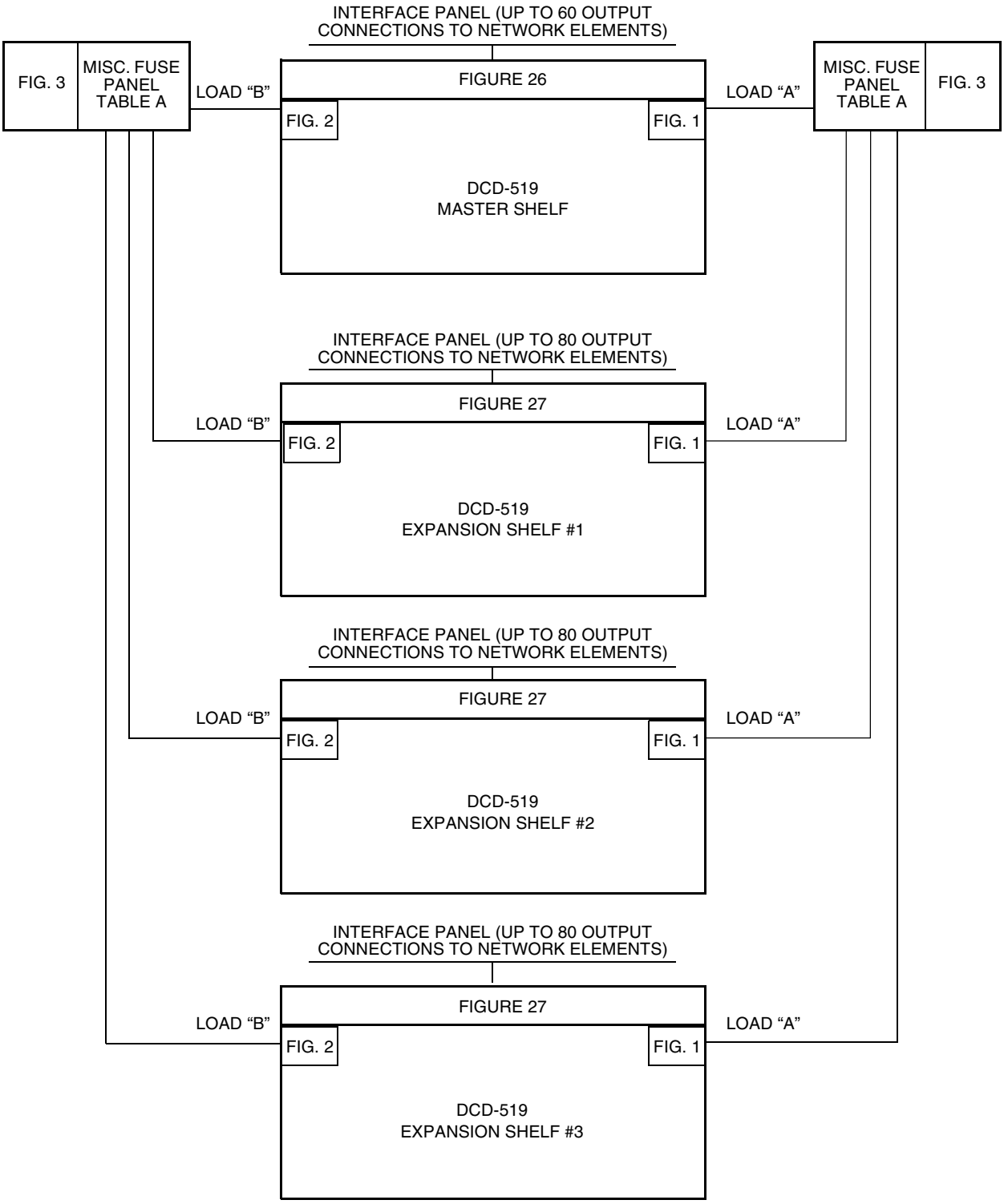
EU 25.3 mils, 0.643 mm (22 AWG) BF TYPE SHIELDED WIRE OR CABLE


THROUGH INTERMEDIATE APPEARANCES

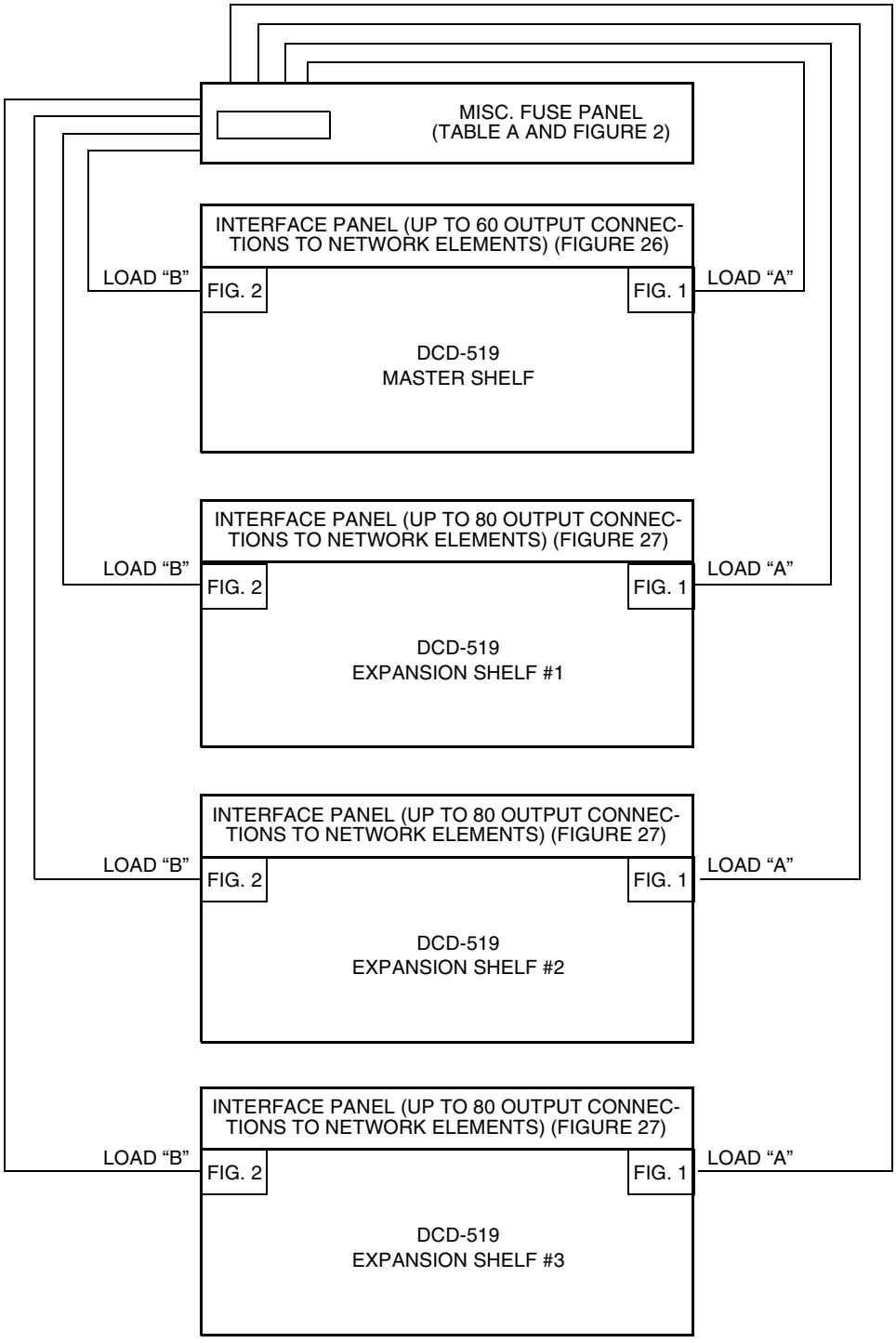

H TAP REDUCER (CHANGE GAUGES OF WIRE)

2. ALL WIRE INCLUDING WIRES IN SWITCHBOARD CABLES SHALL BE 20.1 mils, 0.511 mm (24 AWG) UNLESS OTHERWISE SPECIFIED.

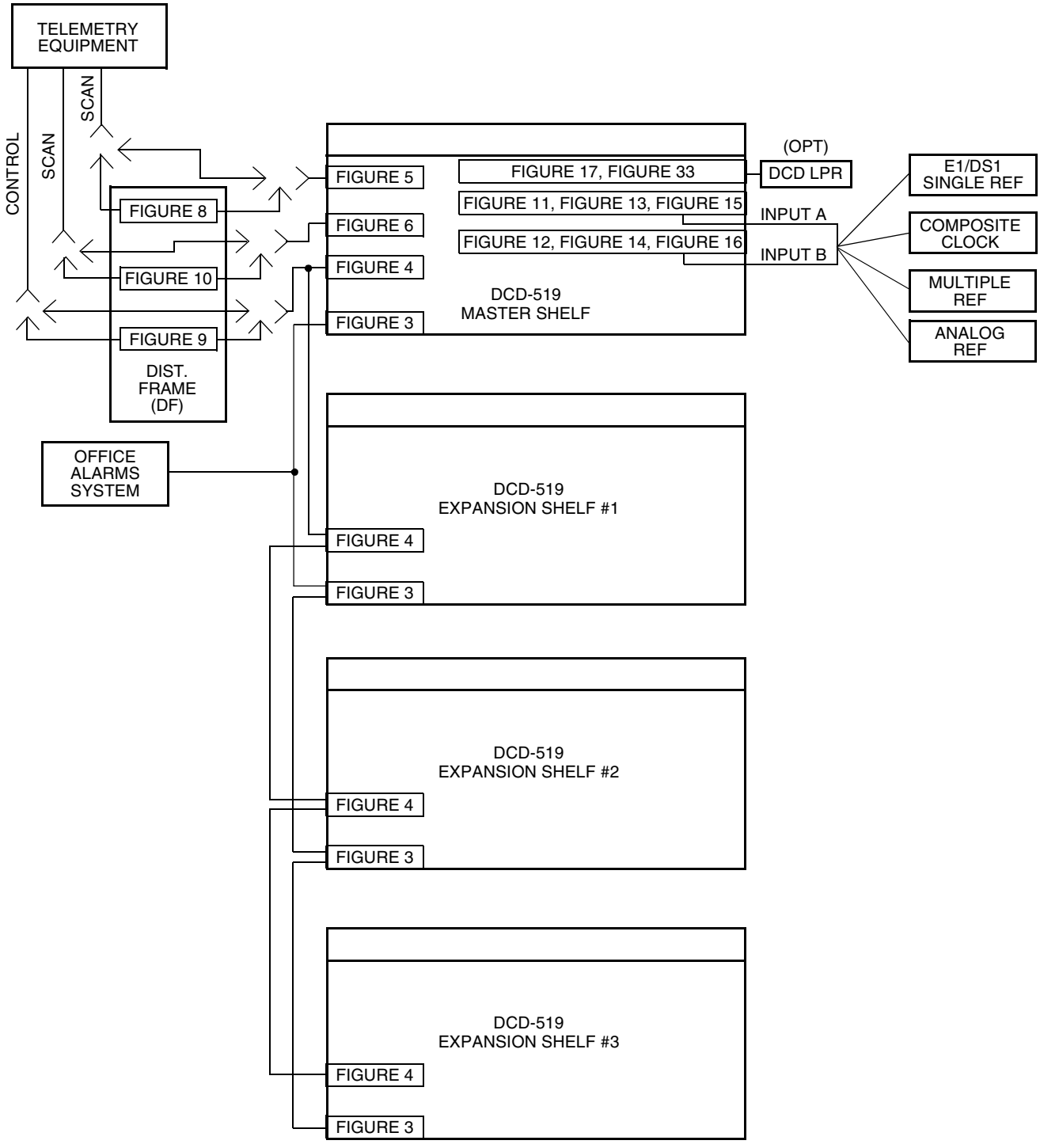
3. <u>25.3 mils, 0.643 mm (22 AWG) SHIELDED TWISTED PAIR CABLE:</u>
BELDEN 8450
GENERAL CABLE CM22
AT&T 22BF



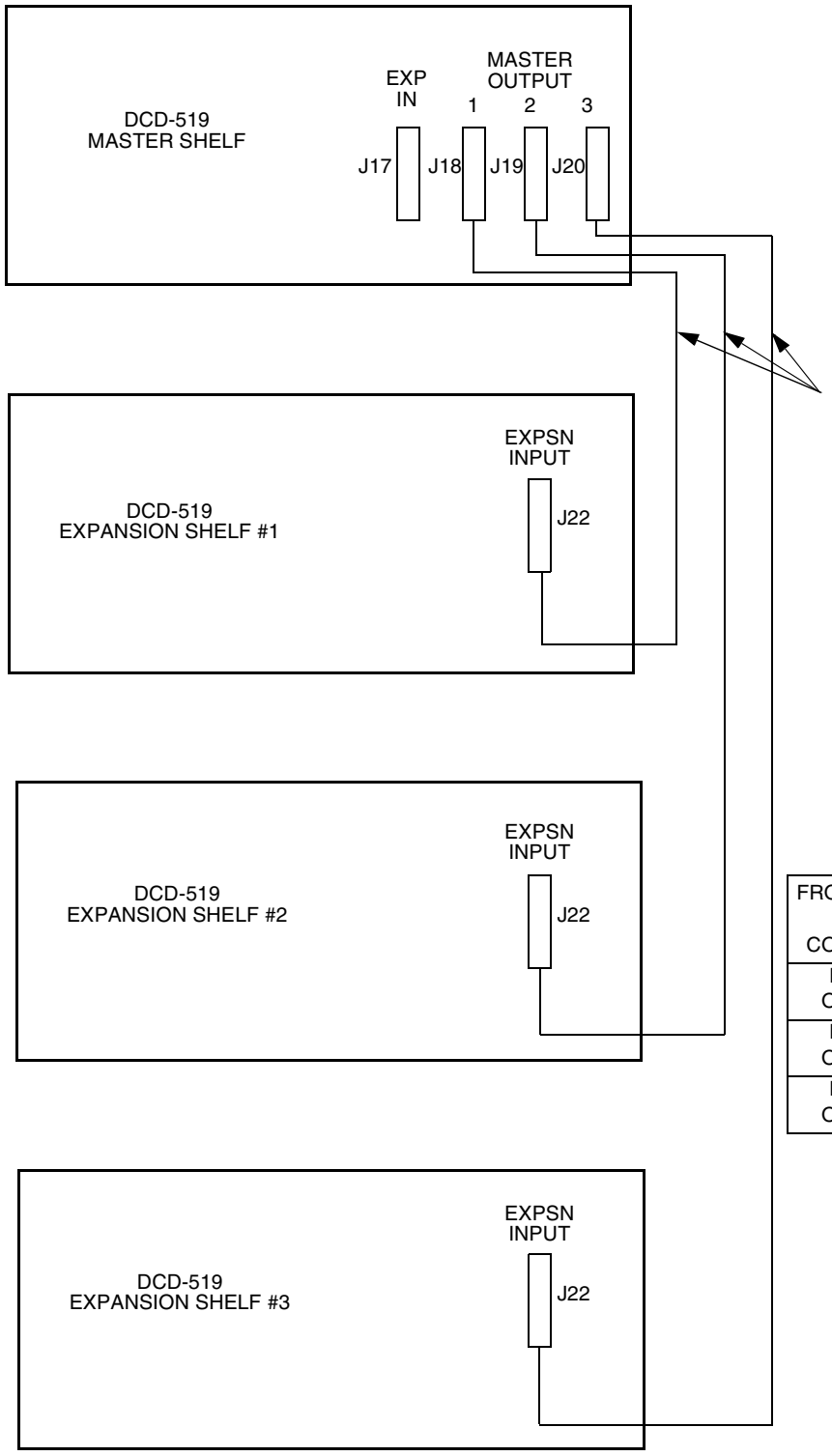

APPLICATION SCHEMATIC #1
DCD-519 SYSTEM – RACK MOUNT
(EXTERNAL OUTPUT AND POWER CABLING)




APPLICATION SCHEMATIC #1A
DCD-519 SYSTEM – CABINET MOUNT
(OUTPUT AND POWER CABLING)
(Manufacturing Discontinued)

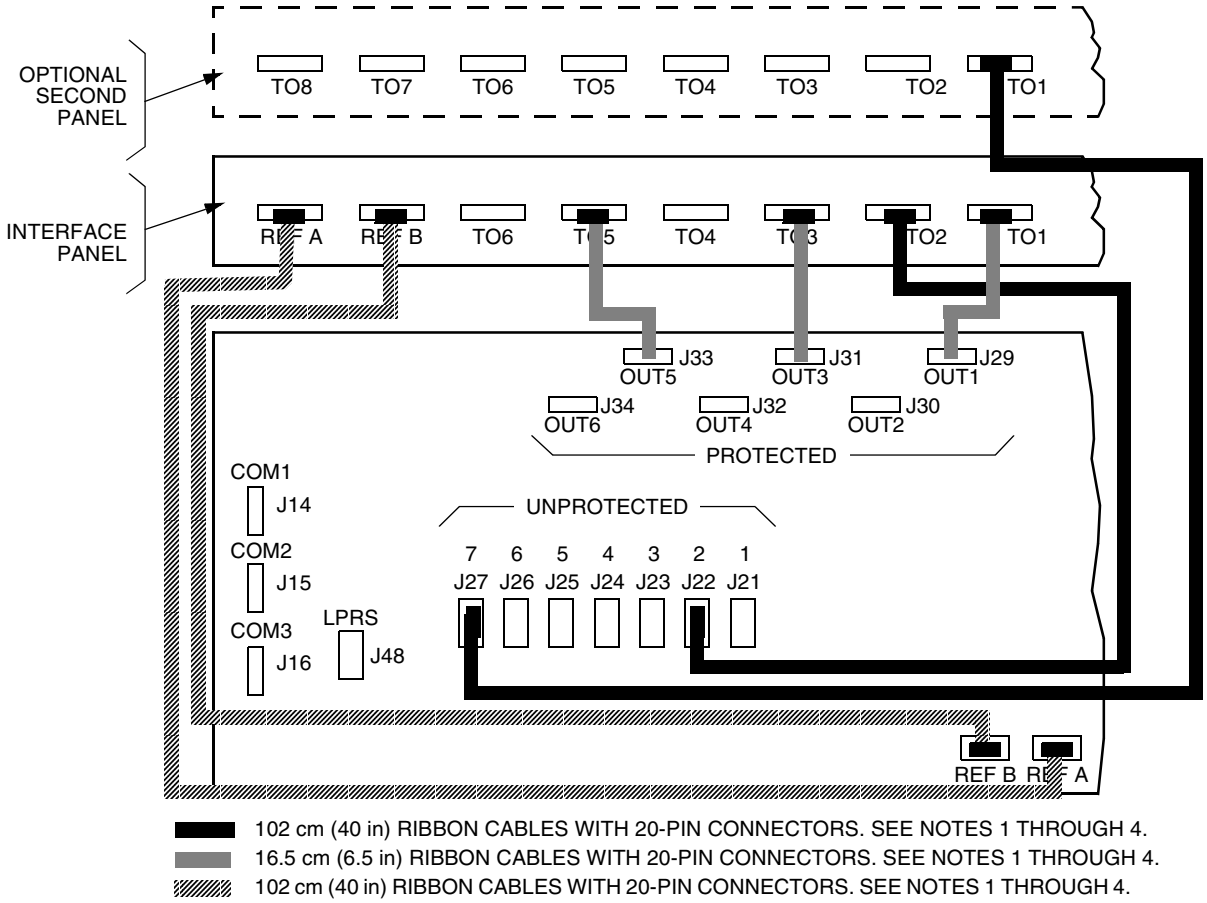



APPLICATION SCHEMATIC #2
DCD-519 SYSTEM
(EXTERNAL INPUT, ALARM, STATUS, AND CONTROL CABLING)
(Manufacturing Discontinued – See APPLICATION SCHEMATIC #11)




| FROM MASTER SHELF CONNECTOR | TO EXPANSION SHELF CONNECTOR | |
|---|---|---|
| | SHELF | CONNECTOR |
| MASTER OUTPUT 1 | EXP. #1 | EXPSN INPUT |
| MASTER OUTPUT 2 | EXP. #2 | EXPSN INPUT |
| MASTER OUTPUT 3 | EXP. #3 | EXPSN INPUT |

APPLICATION SCHEMATIC #3
MASTER-TO-EXPANSION INTER-BAY CABLING



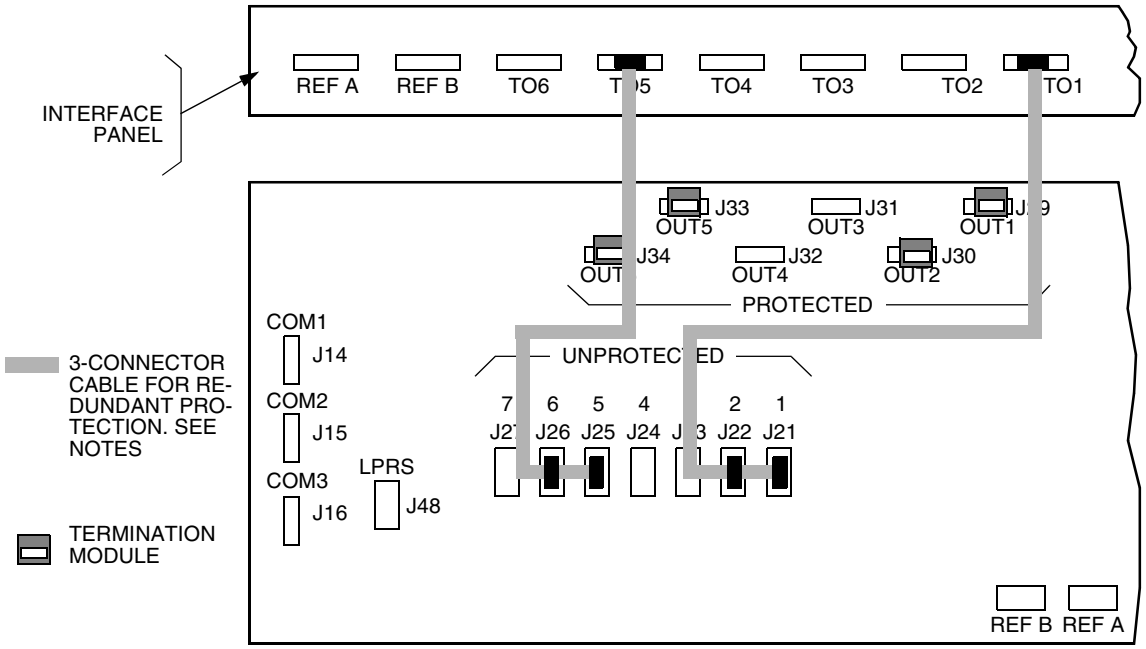

Notes:

1. Six 16.5 cm (6.5 in) ribbon cables (p/n 060-40001-02) are provided with each interface panel (for protected outputs, as well as for PSM inputs). A 102 cm (40 in) ribbon cable (p/n 060-40001-10) is supplied with each ESCIU module. 102 cm (40 in) ribbon cables (p/n 060-40001-10) may be purchased from Symmetricom (for unprotected outputs; no hot spare switching). If additional outputs are required, a second interface panel may be required, 102 cm (40 in) ribbon cables (p/n 060-40001-10) for connection to the second panel will be needed; these may be ordered.
2. Protected connectors OUT1 through OUT5 are to be cabled to connectors TO1 through TO5 on the interface panel. Connector OUT6 may be cabled to Connector TO6 on the interface panel to provide a 6th output in lieu of hot spare use (Slot TO6/HS1).
3. Unprotected connectors J21 through J26 (typically used for ESCIU/SCIU connections) are to be cabled to TO1 through TO6/HS1 on the master interface panel. J27 may be connected to TO1 on an expansion interface panel to provide a 7th output in lieu of hot spare use (Slot HS2). However, J27 (HS2) is not recommended for use as an output slot.
4. Any combination of protected and unprotected outputs may be provisioned, however, only one output (either protected or unprotected) may be used from the DCD Shelf to any one output port, i.e., if J29 is connected to TO1, then J21 (which also connects to TO1) cannot be connected.
5. Two 102 cm (40 in) ribbon cables (p/n 060-00031-02) are provided with each master shelf interface panel for clock input connections. Clock input connectors REF A and REF B on the interface panel are to be cabled to REF A and REF B on the shelf backplane.
6. APPLICATION SCHEMATIC #4A shows redundant protection cabling.

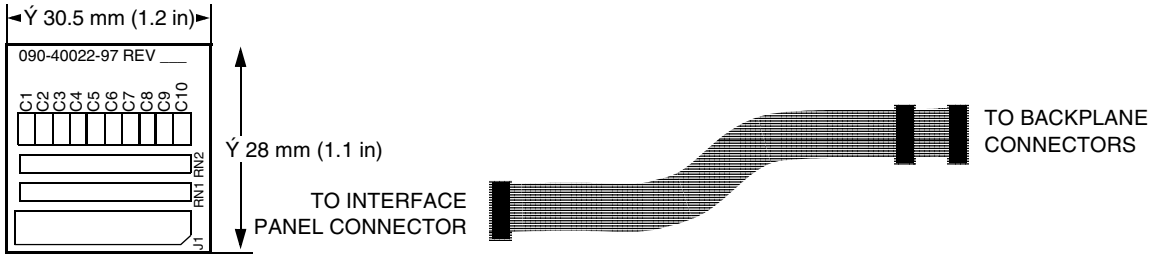
APPLICATION SCHEMATIC #4
CABLING FROM MASTER SHELF TO INTERFACE PANEL – 1:N PROTECTION
(REFER TO TABLE C)

TABLE C.
MASTER SHELF TO INTERFACE PANEL CABLING – 1:N PROTECTION

| FROM MASTER SHELF CONNECTOR | TO INTERFACE PANEL CONNECTOR | PROTECTED | UNPROTECTED | INTERFACE PANEL |
|---|---|---|---|---|
| 1:N PROTECTION | | | | |
| OUT1 (J29) | TO1 | X | — | LOWER |
| OUT2 (J30) | TO2 | X | — | LOWER |
| OUT3 (J31) | TO3 | X | — | LOWER |
| OUT4 (J32) | TO4 | X | — | LOWER |
| OUT5 (J33) | TO5 | X | — | LOWER |
| OUT6 (J34) (OPTIONAL 6TH OUTPUT) | TO6 | X | — | LOWER |
| J21 | TO1 | — | X | LOWER |
| J22 | TO2 | — | X | LOWER |
| J23 | TO3 | — | X | LOWER |
| J24 | TO4 | — | X | LOWER |
| J25 | TO5 | — | X | LOWER |
| J26 (OPTIONAL 6TH OUTPUT) | TO6 | — | X | LOWER |
| J27 (OPTIONAL 7TH OUTPUT) (SEE NOTE) | TO1 (ON SECOND INTERFACE PANEL) | — | X | UPPER |
| REFERENCE INPUT | | | | |
| REF A | REF A | N/A | N/A | LOWER |
| REF B | REF B | N/A | N/A | LOWER |
| NOTE: THIS IS NOT RECOMMENDED FOR USE AS AN OUTPUT SLOT. | | | | |




A. REDUNDANT PROTECTION CONNECTIONS




B. TERMINATION MODULE

C. 3-CONNECTOR RIBBON CABLE

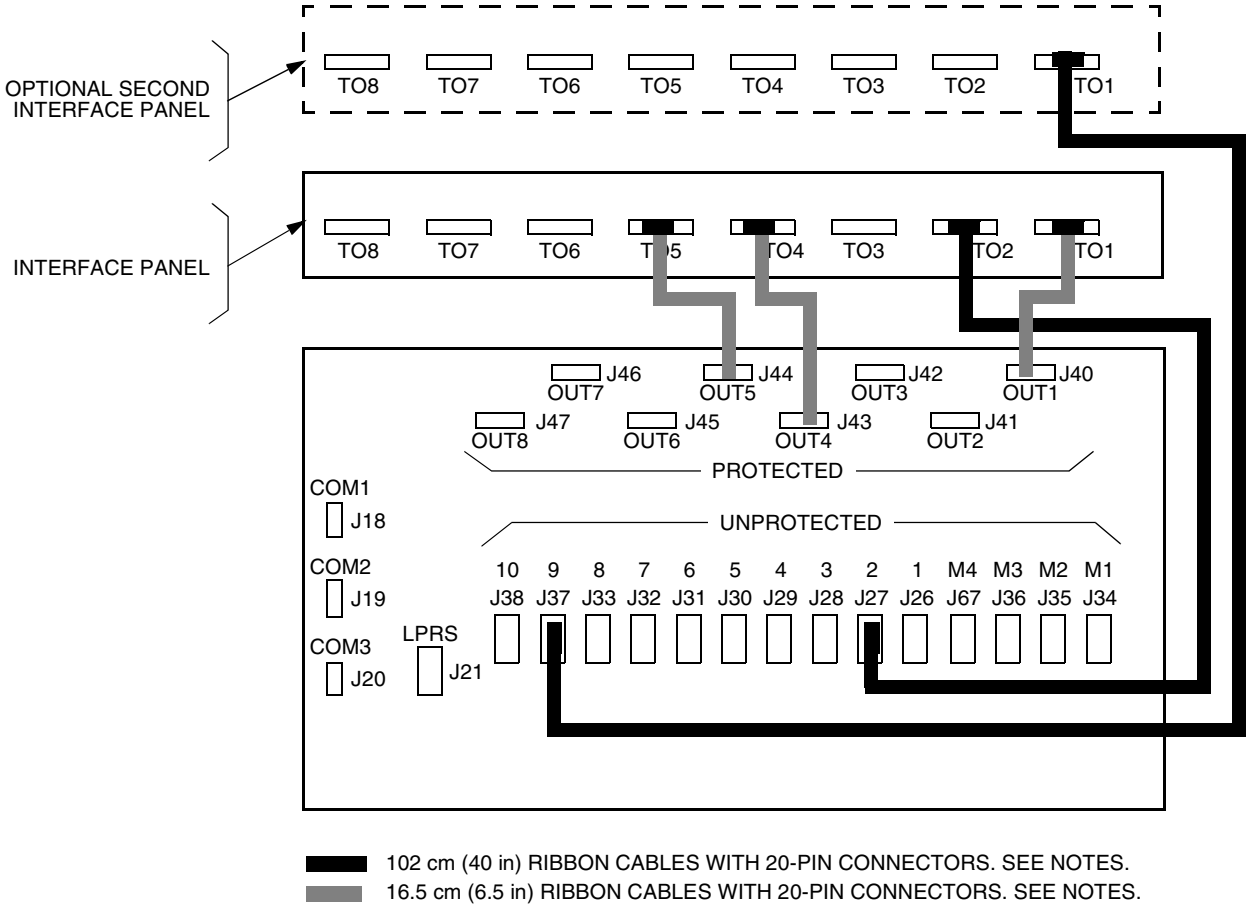
Notes:

1. If configuring for redundant protection, a redundant protection hardware kit must be ordered for each pair of redundant protection cards installed. This kit contains a 3-connector ribbon cable and two termination modules. The termination modules are installed on both protected connectors corresponding to the unprotected connectors used for redundant protection connections.
2. Redundant protection cards and like-type 1:N cards, as well as any TO card, can be intermixed in the shelf.
3. The 2-connector end of the cable attaches to the unprotected connectors with the end connector attached to the connector corresponding to the slot in which the redundant protection card is installed (i.e., if the redundant protection card is in Slots TO1/TO2, plug the end connector into unprotected TO1 [J21]).
4. To ensure optimum performance from the redundant protection cards, install redundant protection card pairs only in the following slots: TO1/TO2, TO3/TO4, TO5/TO6.

APPLICATION SCHEMATIC #4A
REDUNDANT PROTECTION CABLING FROM MASTER SHELF TO INTERFACE PANEL
(REFER TO TABLE D)
(Manufacturing Discontinued – See APPLICATION SCHEMATIC #9)

TABLE D.
MASTER SHELF TO INTERFACE PANEL CABLING – REDUNDANT PROTECTION
(Manufacturing Discontinued – See TABLE R)

| IF REDUNDANT CARDS ARE INSTALLED IN SLOTS . . . | FROM MASTER SHELF UNPROTECTED OUTPUT CONNECTOR | TO INTERFACE PANEL CONNECTOR | INSTALL TERMINATION MODULE ON MASTER SHELF PROTECTED CONNECTOR . . . | INSTALL END CONNECTOR (OF CABLE) ON UNPROTECTED OUTPUT CONNECTOR . . . |
|---|---|---|---|---|
| TO1 AND TO2 | J21 AND J22 | TO1 | OUT1 (J29) AND OUT2 (J30) | J21 |
| TO2 AND TO3 | NOT RECOMMENDED | | | |
| TO3 AND TO4 | J23 AND J24 | TO3 | OUT3 (J31) AND OUT4 (J32) | J23 |
| TO4 AND TO5 | NOT RECOMMENDED | | | |
| TO5 AND TO6/HS1 | J25 AND J26 | TO5 | OUT5 (J33) AND OUT6 (J34 | J25 |
| TO6/HS1 AND HS2 | NOT ALLOWED | | | |



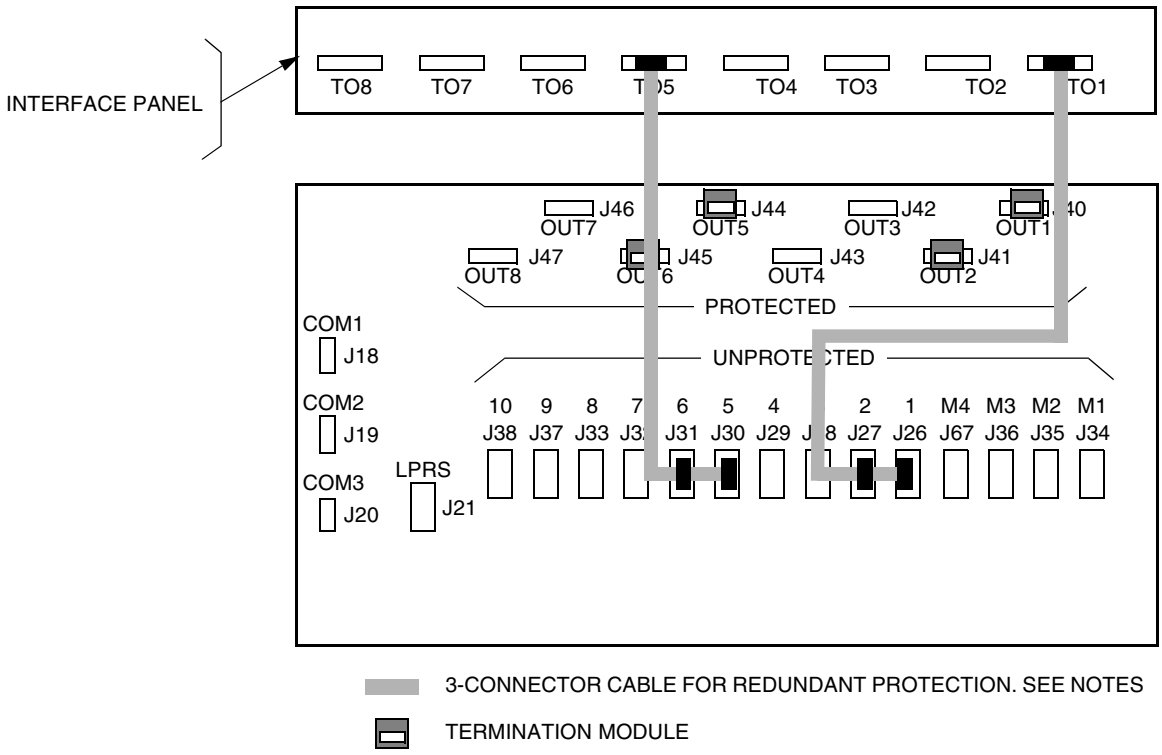

Notes:

1. Eight 16.5 cm (6.5 in) ribbon cables (p/n 060-40001-02) are provided with each interface panel (for protected outputs, as well as for PSM inputs). A 102 cm (40 in) ribbon cable (p/n 060-40001-10) is supplied with each ESCIU module. 102 cm (40 in) ribbon cables (p/n 060-40001-10) for unprotected outputs (no hot spare switching) may be purchased from Symmetricom. If additional outputs are required, a second interface panel may be required, 102 cm (40 in) ribbon cables (p/n 060-40001-10) for connection to the second panel will be needed; these may be ordered.
2. Protected connectors OUT1 through OUT8 are to be cabled to connectors TO1 through TO8 on the interface panel.
3. Unprotected connectors J26 through J33 (typically used for ESCIU/SCIU connections) are to be cabled to output connectors TO1 Through TO8. If the shelf is provisioned for all unprotected outputs, a second interface panel will be required. Cable connectors J37 and J38 to TO1 AND TO2, and connectors J34, J35, J36, and J67 (M1 through M4), when used, to the second panel, however, this is not recommended.
4. Any combination of protected and unprotected outputs may be provisioned, however, only one output (either protected or unprotected) may be used from the DCD Shelf to any one output port, i.e., if J26 is connected to TO1, then J40 (which also connects to TO1) cannot be connected.
5. APPLICATION SCHEMATIC #5A shows redundant protection cabling examples.

APPLICATION SCHEMATIC #5
CABLING FROM EXPANSION SHELF TO INTERFACE PANEL – 1:N PROTECTION
(REFER TO TABLE E)

TABLE E.
EXPANSION SHELF TO INTERFACE PANEL CABLING - 1:N PROTECTION

| FROM EXPANSION SHELF CONNECTOR | TO INTERFACE PANEL CONNECTOR | PROTECTED | UNPROTECTED | INTERFACE PANEL |
|---|---|---|---|---|
| J40 | TO1 | X | — | LOWER |
| J41 | TO2 | X | — | LOWER |
| J42 | TO3 | X | — | LOWER |
| J43 | TO4 | X | — | LOWER |
| J44 | TO5 | X | — | LOWER |
| J45 | TO6 | X | — | LOWER |
| J46 | TO7 | X | — | LOWER |
| J47 | TO8 | X | — | LOWER |
| J26 | TO1 | — | X | LOWER |
| J27 | TO2 | — | X | LOWER |
| J28 | TO3 | — | X | LOWER |
| J29 | TO4 | — | X | LOWER |
| J30 | TO5 | — | X | LOWER |
| J31 | TO6 | — | X | LOWER |
| J32 | TO7 | — | X | LOWER |
| J33 | TO8 | — | X | LOWER |
| J37 (HS1) (NOTE) | TO1 | — | X | UPPER |
| J38 (HS2) (NOTE) | TO2 | — | X | UPPER |
| J34 (MON1) | RESERVED FOR FUTURE USE | | | |
| J35 (MON2) | | | | |
| J36 (MON3) | | | | |
| J67 (MON4) | | | | |
| NOTE: THIS IS NOT RECOMMENDED FOR USE AS AN OUTPUT SLOT. | | | | |



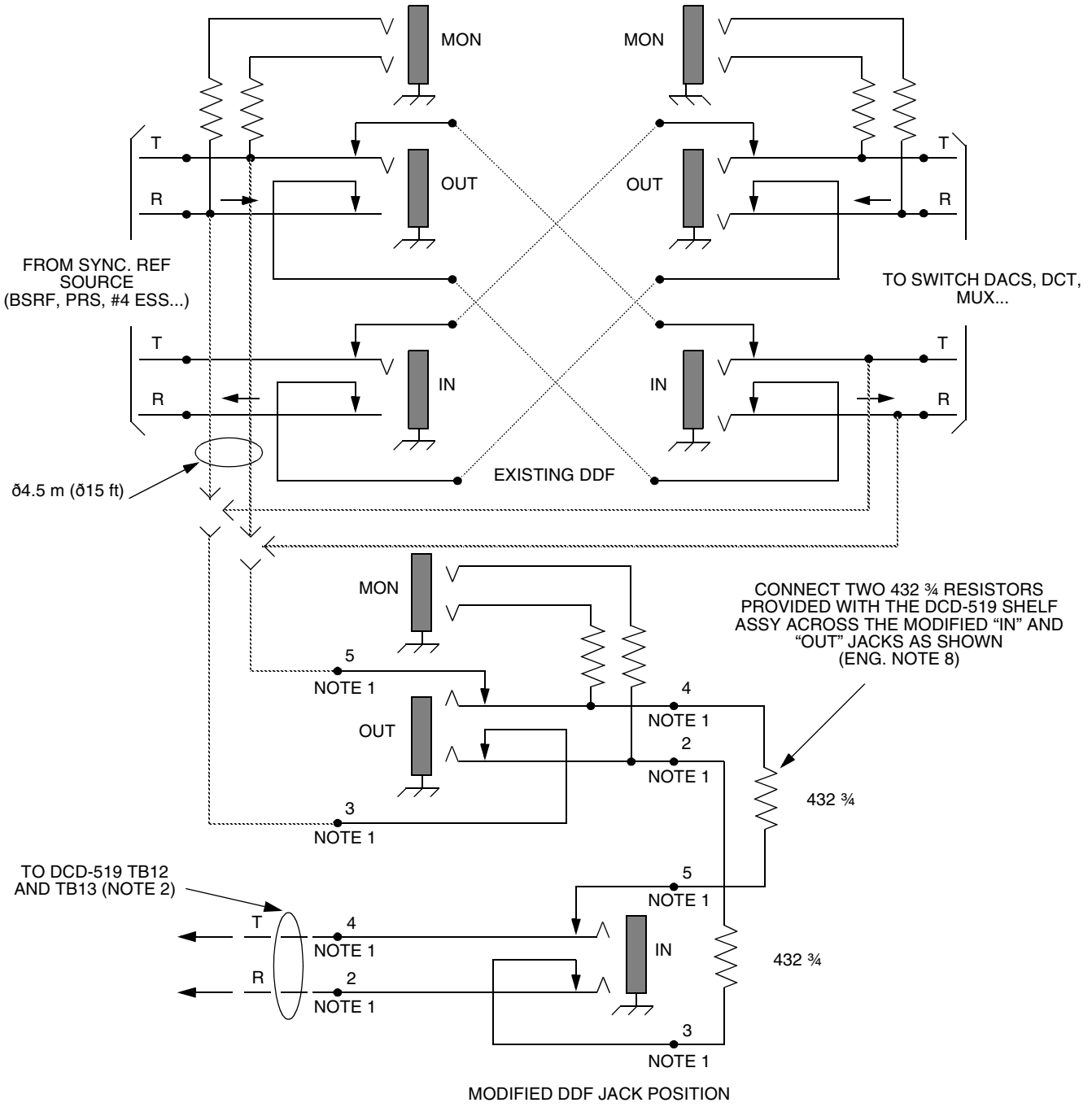

Notes:

1. If configuring for redundant protection, a redundant protection hardware kit must be ordered for each pair of redundant protection cards installed. This kit contains a 3-connector ribbon cable and two termination modules. The termination modules are installed on both protected connectors corresponding to the unprotected connectors used for redundant protection connections.
2. Redundant protection cards and like-type 1:N cards, as well as any to card, can be intermixed in the shelf.
3. The 2-connector end of the cable attaches to the unprotected connectors with the end connector attached to the connector corresponding to the slot in which the redundant protection card is installed (i.e., if the redundant protection card is in Slots TO1/TO2, plug the end connector into unprotected TO1 [J26]).
4. To ensure optimum performance from the redundant protection cards, install redundant protection card pairs only in the following slots: TO1/TO2, TO3/TO4, TO5/TO6, TO7/TO8.

APPLICATION SCHEMATIC #5A
CABLING FROM EXPANSION SHELF TO INTERFACE PANEL – REDUNDANT PROTECTION
(REFER TO TABLE F)
(Manufacturing Discontinued – See APPLICATION SCHEMATIC #10)

TABLE F.
EXPANSION SHELF TO INTERFACE PANEL CABLING – REDUNDANT PROTECTION
(Manufacturing Discontinued – See TABLE S)

| IF REDUNDANT CARDS ARE INSTALLED IN SLOTS . . . | FROM EXPANSION SHELF UNPROTECTED OUTPUT CONNECTOR | TO INTERFACE PANEL CONNECTOR | INSTALL TERMINATION MODULE ON EXPANSION SHELF PROTECTED CONNECTOR . . . | INSTALL END CONNECTOR (OF CABLE) ON UNPROTECTED OUTPUT CONNECTOR . . . |
|---|---|---|---|---|
| TO1 AND TO2 | J26 AND J27 | TO1 | OUT1 (J40) AND OUT2 (J41) | J26 |
| TO2 AND TO3 | NOT RECOMMENDED | | | |
| TO3 AND TO4 | J28 AND J29 | TO3 | OUT3 (J42) AND OUT4 (J43) | J28 |
| TO4 AND TO5 | NOT RECOMMENDED | | | |
| TO5 AND TO6 | J30 AND J31 | TO5 | OUT5 (J44) AND OUT6 (J45) | J30 |
| TO6 AND TO7 | NOT RECOMMENDED | | | |
| TO7 AND TO8 | J32 AND J33 | TO7 | OUT7 (J46) AND OUT8 (J47) | J32 |
| TO8 AND HS1 | NOT RECOMMENDED; A SECOND INTERFACE PANEL WILL HAVE TO BE INSTALLED. | | | |

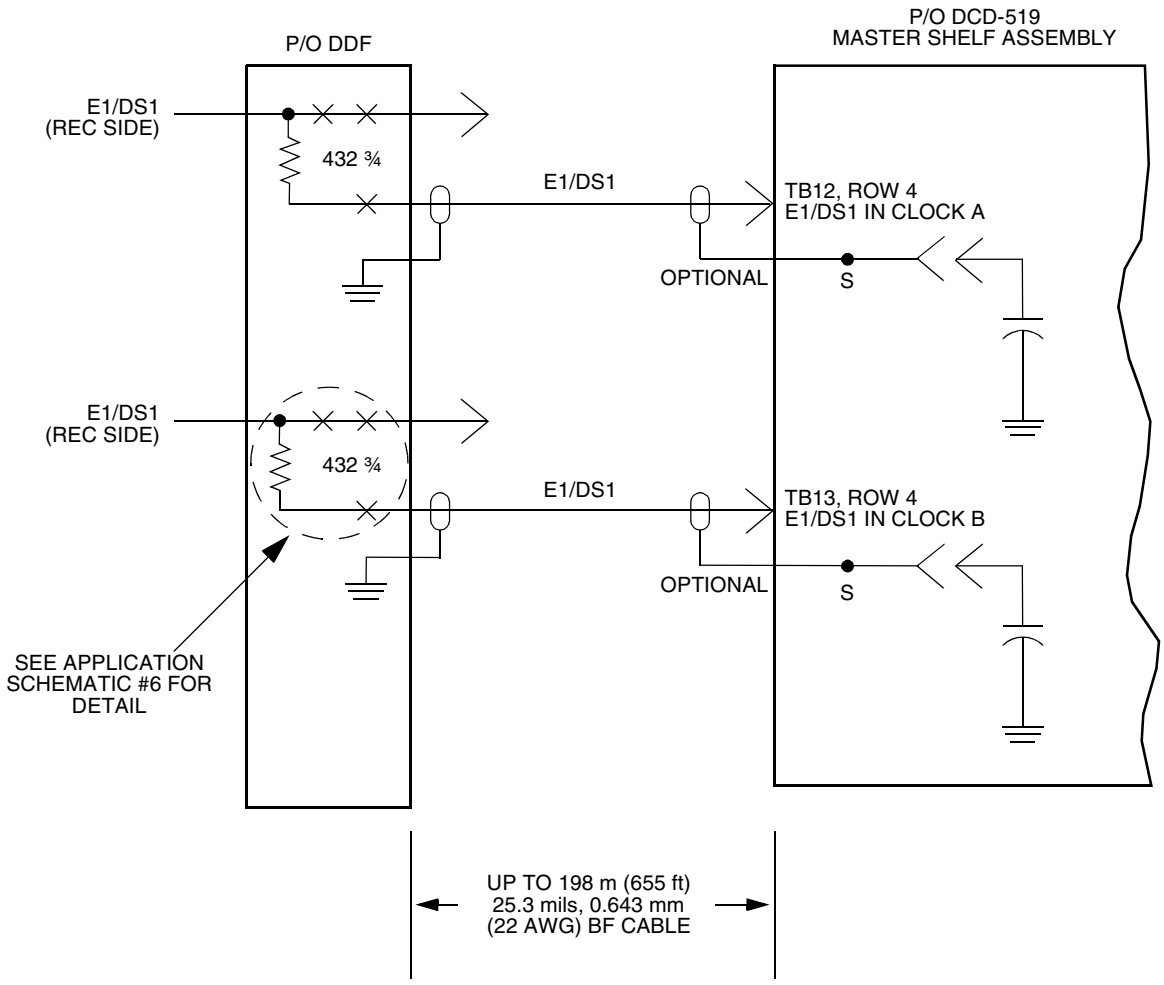



MODIFIED DDF JACK POSITION

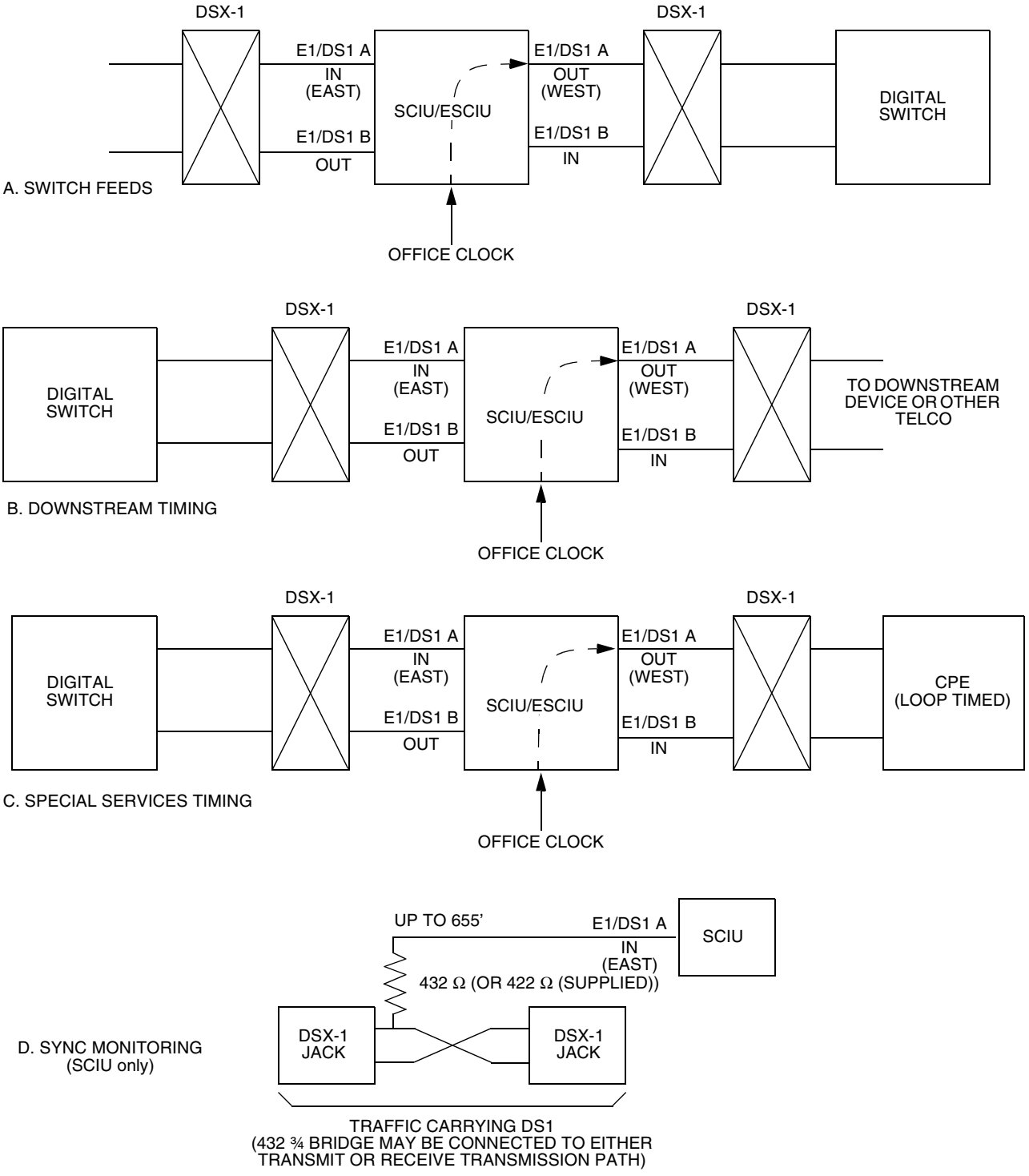
Notes:

1. Terminal number for jack set shown for reference only.
2. Single E1/DS1 input connects to Position #4 of TB12 or TB13; multiple E1/DS1 inputs connect to Positions 2, 3, 4, and 5 of TB12 or TB13. Up to 198 m (655 ft) using 25.3 mils, 0.643 mm (22 AWG) shielded twisted pair cable.

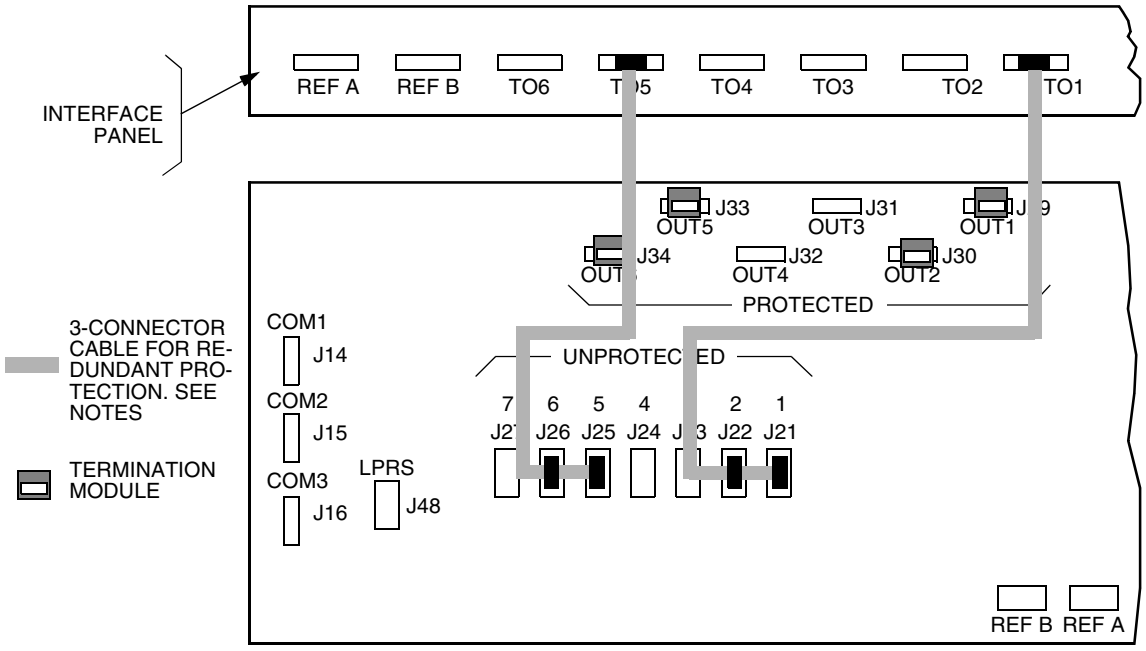
APPLICATION SCHEMATIC #6
BRIDGING CONNECTION FROM TRAFFIC-CARRYING E1/DS1
(ENG. NOTES 4, 7, 8, AND 9)



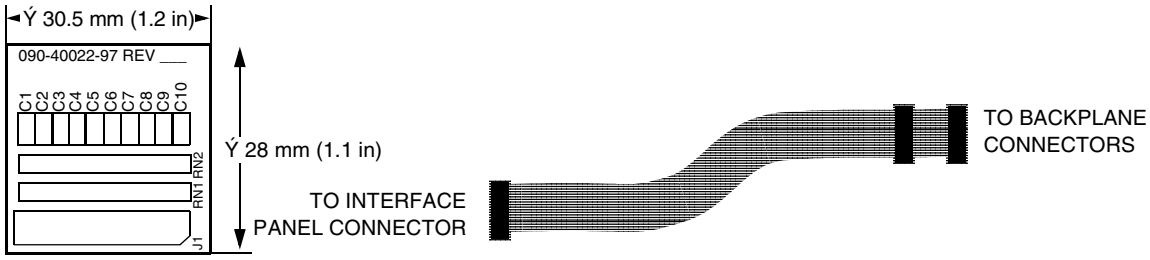

APPLICATION SCHEMATIC #7
TYPICAL E1/DS1 BRIDGING CONNECTIONS
(SEE ENG. NOTES 4, 5, 7, AND 8)




APPLICATION SCHEMATIC #8
ESCIU/SCIU TIMING APPLICATIONS




A. REDUNDANT PROTECTION CONNECTIONS



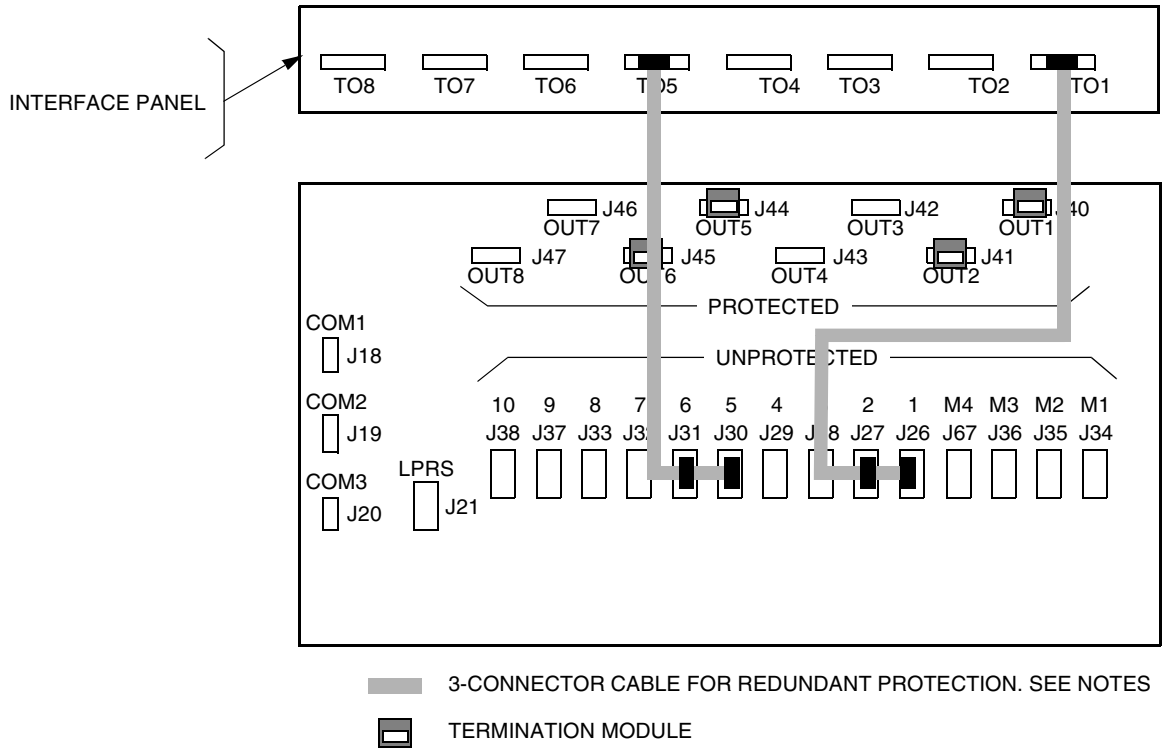

B. TERMINATION MODULE

C. 3-CONNECTOR RIBBON CABLE

Notes:

1. If configuring for redundant protection, a redundant protection hardware kit must be ordered for each pair of redundant protection cards installed. This kit contains a 3-connector ribbon cable and two termination modules. The termination modules are installed on both protected connectors corresponding to the unprotected connectors used for redundant protection connections.
2. Redundant protection cards and 1:N cards cannot be intermixed in the shelf.
3. The 2-connector end of the cable attaches to the unprotected connectors with the end connector attached to the connector corresponding to the slot the redundant protection card is installed (i.e., if the redundant protection card is in Slots TO1/TO2, plug the end connector into unprotected TO1 [J21]).
4. To ensure optimum performance from the redundant protection cards, install redundant protection card pairs only in the following slots: TO1/TO2, TO3/TO4, TO5/TO6.

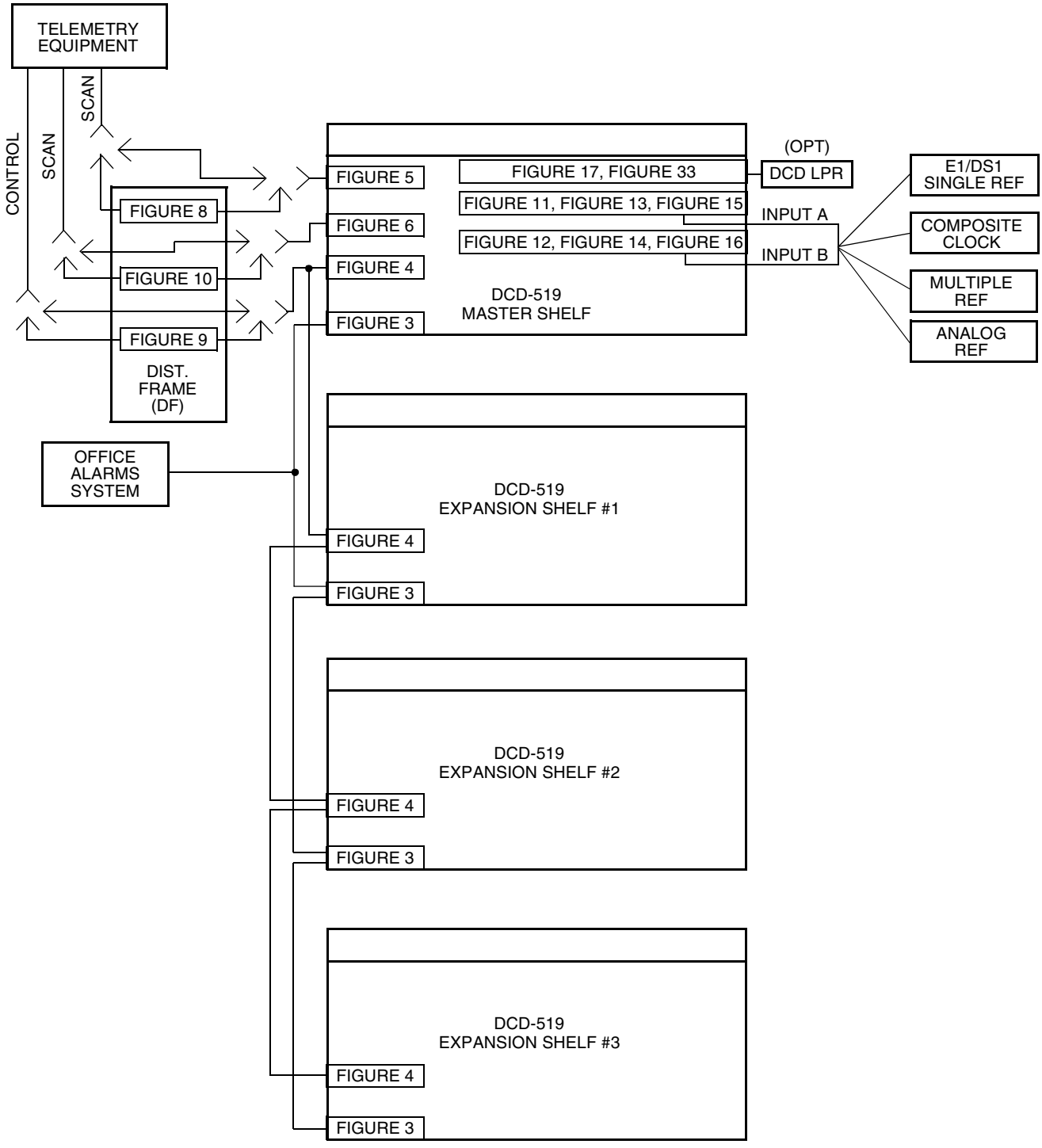
APPLICATION SCHEMATIC #9
REDUNDANT PROTECTION CABLING FROM MASTER SHELF TO INTERFACE PANEL
(REFER TO TABLE D)
(Manufacturing Discontinued – See APPLICATION SCHEMATIC #12)



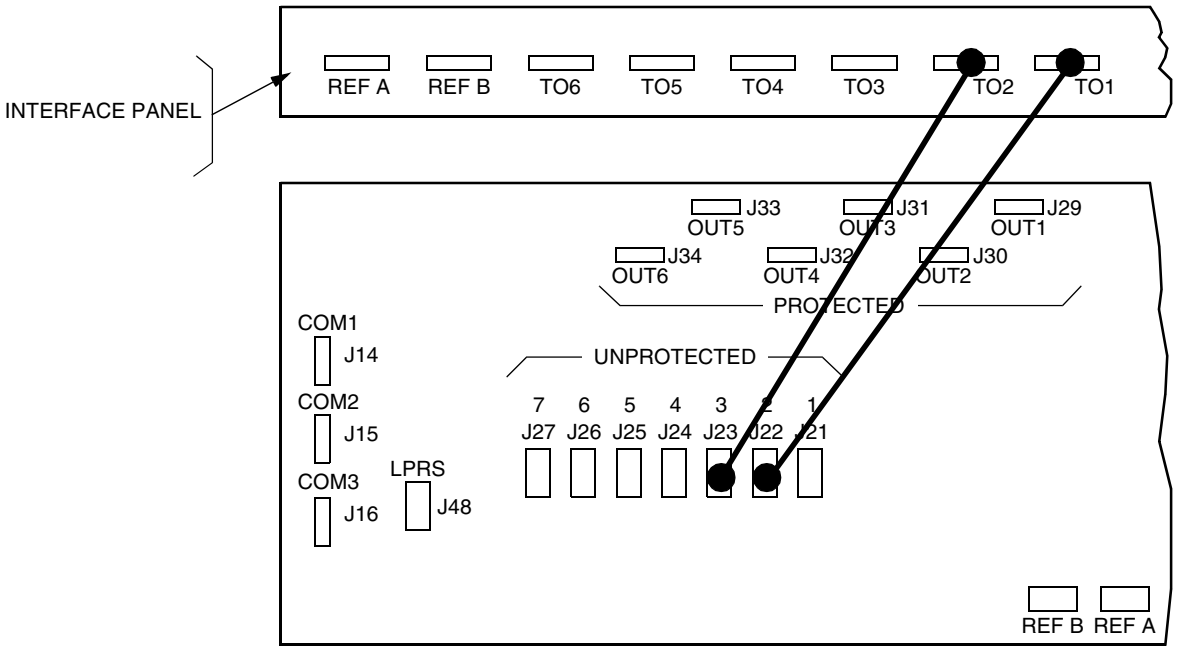

Notes:

1. If configuring for redundant protection, a redundant hardware kit must be ordered for each pair of redundant cards installed. This kit contains a 3-connector ribbon cable and two termination modules. The termination modules are installed on both protected connectors corresponding to the unprotected connectors used for redundant connections.
2. Redundant protection cards and 1:N cards cannot be intermixed in the shelf.
3. The 2-connector end of the cable attaches to the unprotected connectors with the end connector attached to the connector corresponding to the slot in which the redundant card is installed (i.e., if the redundant card is in Slots TO1/TO2, plug the end connector into unprotected TO1 [J26]).
4. To ensure optimum performance from the redundant protection cards, install redundant protection card pairs only in the following slots: TO1/TO2, TO3/TO4, TO5/TO6, TO7/TO8.

APPLICATION SCHEMATIC #10
CABLING FROM EXPANSION SHELF TO INTERFACE PANEL – REDUNDANT PROTECTION
(REFER TO TABLE F)
(Manufacturing Discontinued – See APPLICATION SCHEMATIC #13)

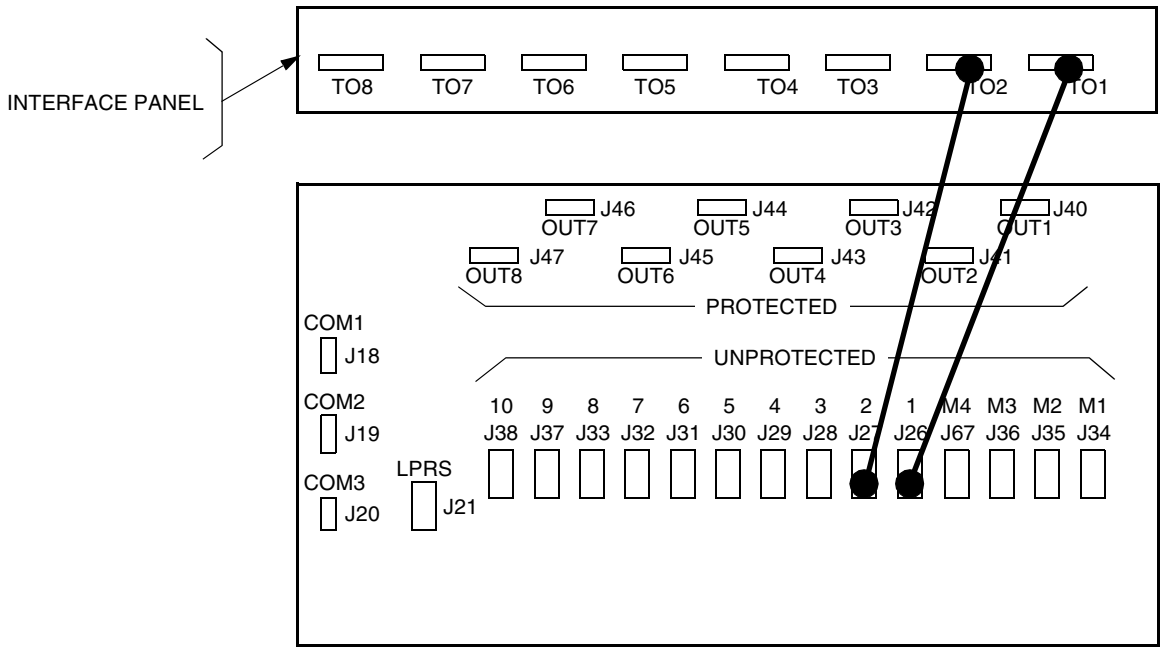



APPLICATION SCHEMATIC #11
DCD-519 SYSTEM
(EXTERNAL INPUT, ALARM, STATUS, AND CONTROL CABLING)



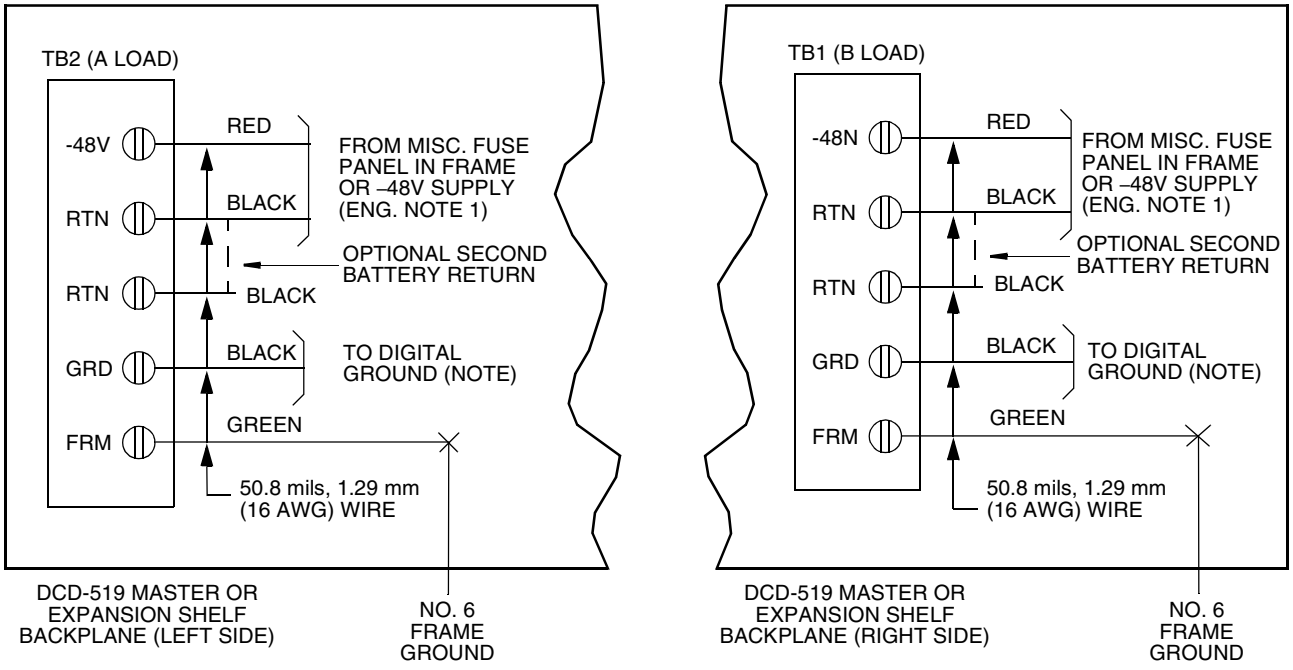

Notes:
1. The connections indicate the end points of the wiring only – cable routing is not shown.
2. 1:N protection cannot be used in the same shelf at the same time as 1:1 or 1+1 protection.

APPLICATION SCHEMATIC #12
EXAMPLE REDUNDANT PROTECTION CABLING FROM MASTER SHELF TO INTERFACE PANEL
(REFER TO TABLE R)




Notes:
1. The connections indicate the end points of the wiring only – cable routing is not shown.
2. 1:N protection cannot be used in the same shelf at the same time as 1:1 or 1+1 protection.

APPLICATION SCHEMATIC #13
EXAMPLE REDUNDANT PROTECTION CABLING FROM EXPANSION SHELF TO INTERFACE PANEL
(REFER TO TABLE S)




Note: Do not connect digital ground (GND) to frame ground (FRM).

FIGURE 1.
POWER CONNECTIONS (A AND B LOADS)
(SEE TABLE G)

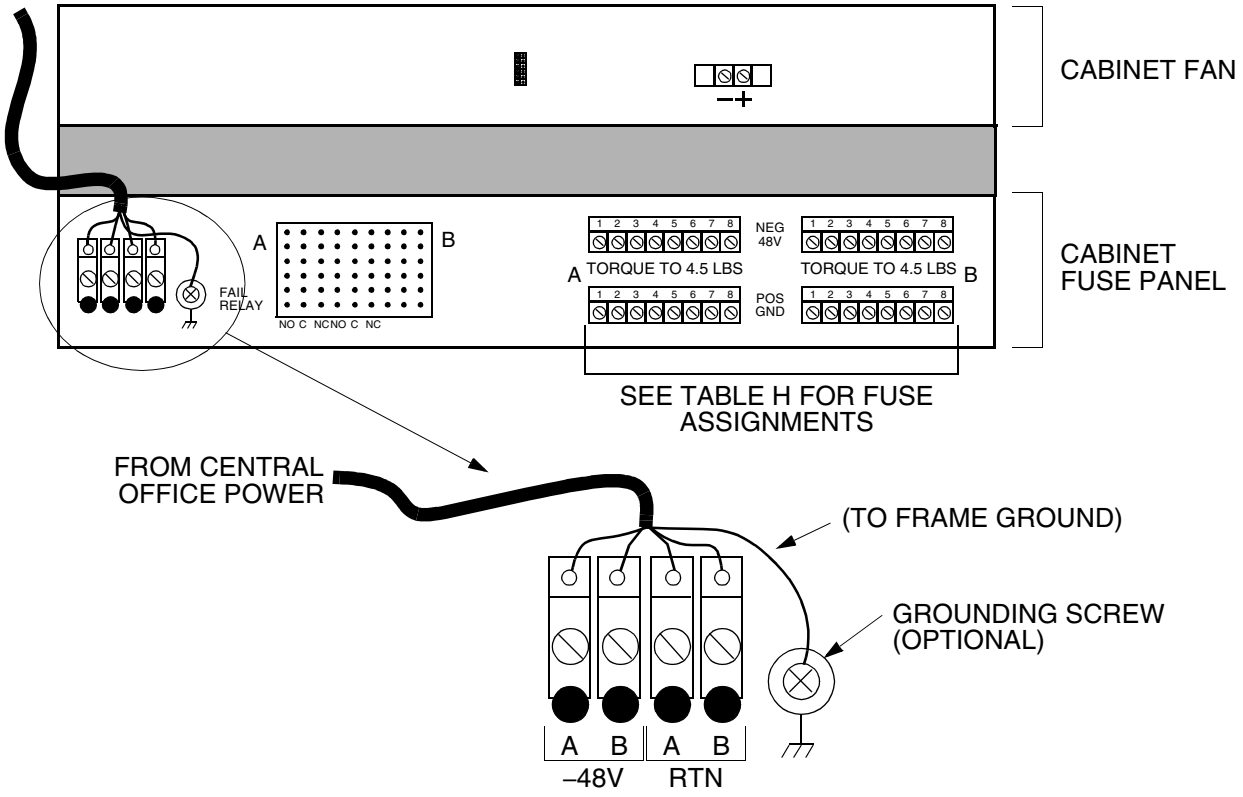



FIGURE 1A.
FUSE PANEL POWER CONNECTIONS (A AND B LOADS)
(SEE TABLE H)
(Manufacturing Discontinued)

TABLE G.
MISC. FUSE PANEL FUSE ASSIGNMENTS

| PANEL FUSE | TERMINAL BLOCK | SHELF | LOAD | SIZE |
|---|---|---|---|---|
| 1A | TB2 | MASTER | A | 7.5 A - 10 A |
| 1B | TB1 | MASTER | B | 7.5 A - 10 A |
| 2A | TB2 | EXPAN. 1 | A | 7.5 A - 10 A |
| 2B | TB1 | EXPAN. 1 | B | 7.5 A - 10 A |
| 3A | TB2 | EXPAN. 2 | A | 7.5 A - 10 A |
| 3B | TB1 | EXPAN. 2 | B | 7.5 A - 10 A |
| 4A | TB2 | EXPAN. 3 | A | 7.5 A - 10 A |
| 4B | TB1 | EXPAN. 3 | B | 7.5 A - 10 A |

NOTE:
MAXIMUM FULLY EQUIPPED SHELF CURRENT DRAIN

| –48V (A) | –48V (B) |
|---|---|
| 1.5 A MAXIMUM* | 1.5 A MAXIMUM* |

* WARM UP CURRENT WITH RUBIDIUM CLOCK CARDS IS 4 A MAXIMUM.

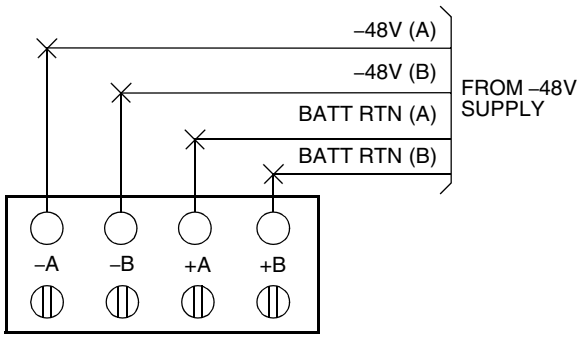
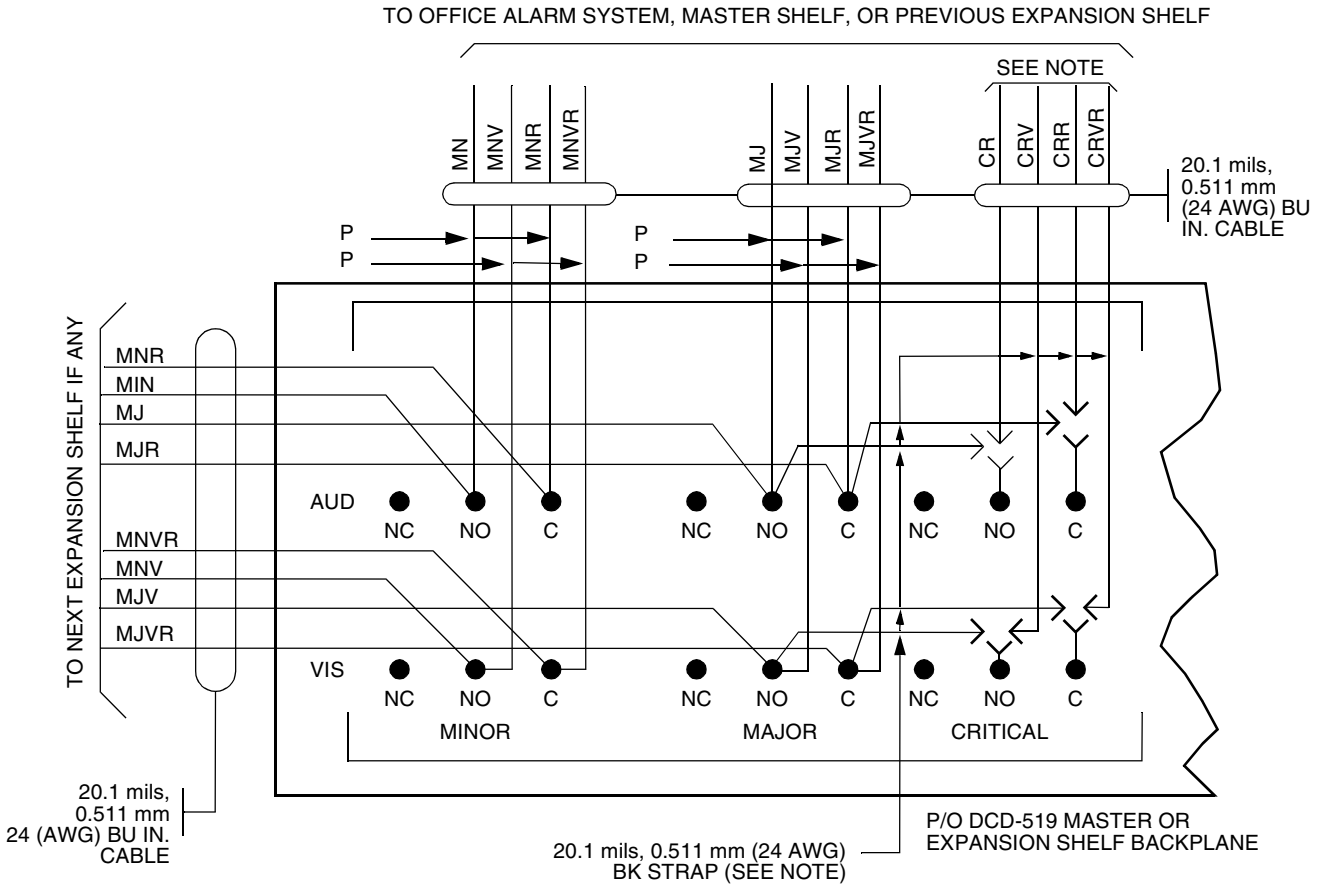



FIGURE 2.
MISC. FUSE PANEL IN FRAME

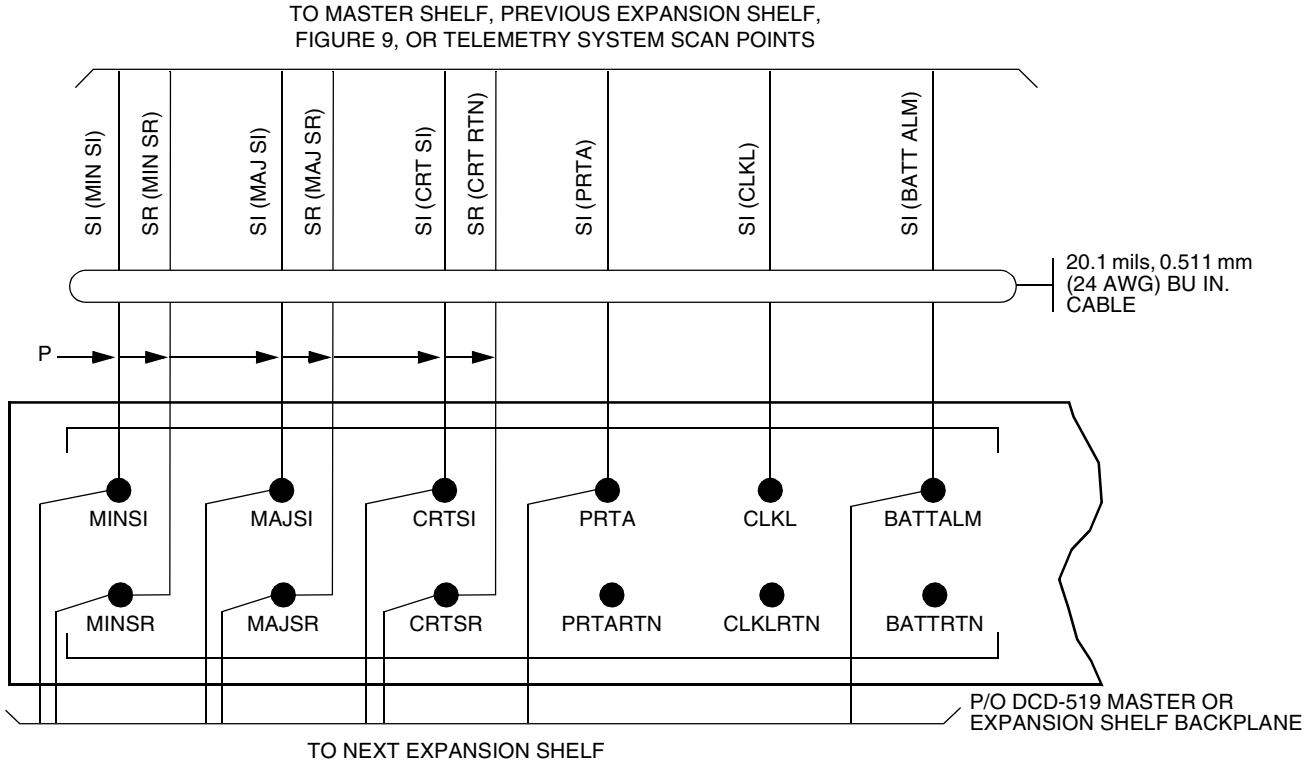
TABLE H.
CABINET FUSE PANEL FUSE ASSIGNMENTS
(Manufacturing Discontinued)

| FUSE | SIZE | ASSIGNMENT | | FUSE | SIZE | ASSIGNMENT |
|---|---|---|---|---|---|---|
| FUSE PANEL - BATTERY A | | | | FUSE PANEL - BATTERY B | | |
| A1 | 2 A | ALARM PANEL (AND FAN) | | B1 | 2 A | ALARM PANEL (AND FAN) |
| A2 | 5 A | DCD-LPR (IF APPLICABLE) | | B2 | 5 A | DCD-LPR (IF APPLICABLE) |
| A3 | 8 A | DCD-519 MASTER SHELF | | B3 | 8 A | DCD-519 MASTER SHELF |
| A4 | 8 A | DCD-519 EXPANSION SHELF (IF APPLICABLE) | | B4 | 8 A | DCD-519 EXPANSION SHELF (IF APPLICABLE) |
| A5 | 8 A | CESIUM A (IF APPLICABLE) | | B5 | 8 A | CESIUM A (IF APPLICABLE) |
| A6 | 8 A | CESIUM B (IF APPLICABLE) | | B6 | 8 A | CESIUM B (IF APPLICABLE) |
| A7 | — | SPARE (MODEM, x.25 PAD) | | B7 | — | SPARE (MODEM, x.25 PAD) |
| A8 | 2 A | ALARM PANEL (AUXILIARY) | | B8 | 2 A | ALARM PANEL (AUXILIARY) |



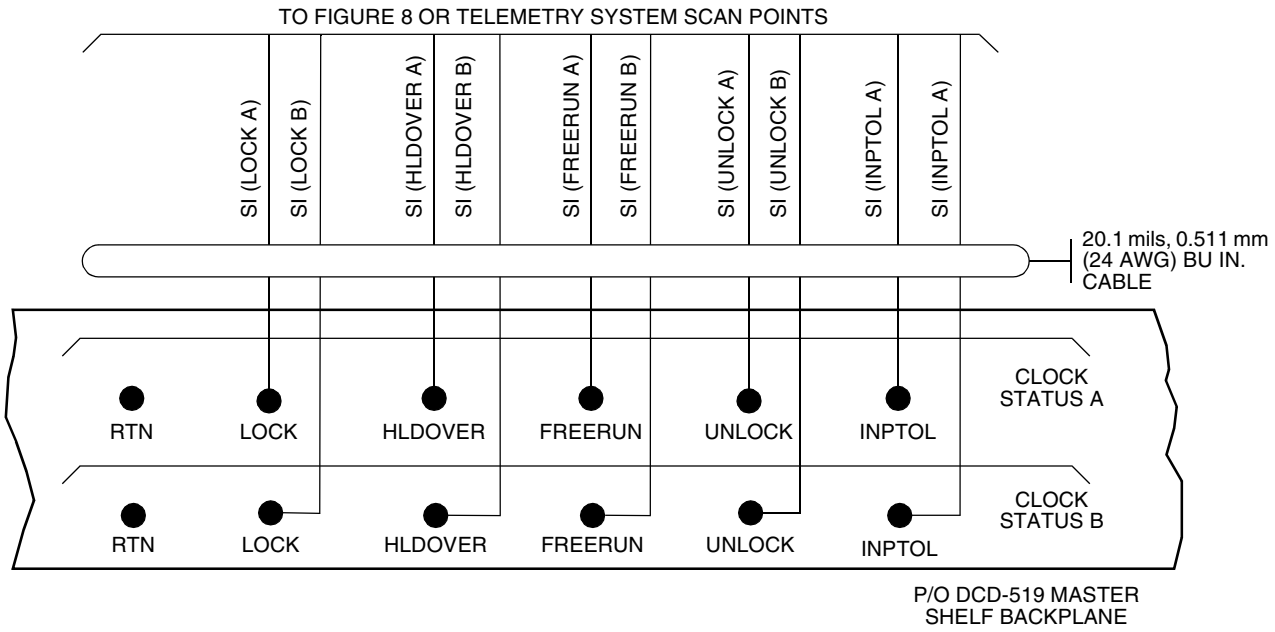

Note: If office alarm system is not provisioned for critical alarms, strap NO and C contacts of CRITICAL to NO and C contacts of MAJOR (AUD and VIS).

FIGURE 3.
OFFICE ALARMS




Note: PRTA, CLKL, and BATTALM RETURN (RTN) terminals are connected internally to the shelf's battery return, therefore, RTN connections between the RTN terminals and the remote telemetry equipment scan-points are not required.

FIGURE 4.
SHELF STATUS
(ENG. NOTES 1 AND 2)




Notes:
1. The RETURN (RTN A and B) (SR) leads are common for all status indicator (SI) leads for each CLOCK STATUS (A and B).
2. The CLOCK STATUS A and B RTN terminal is connected internally to the shelf's battery return, therefore, RTN connections between the DCD-519 Shelf and the telemetry equipment scan- points are not required.

FIGURE 5.
CLOCK STATUS
(ENG. NOTES 1 AND 2)

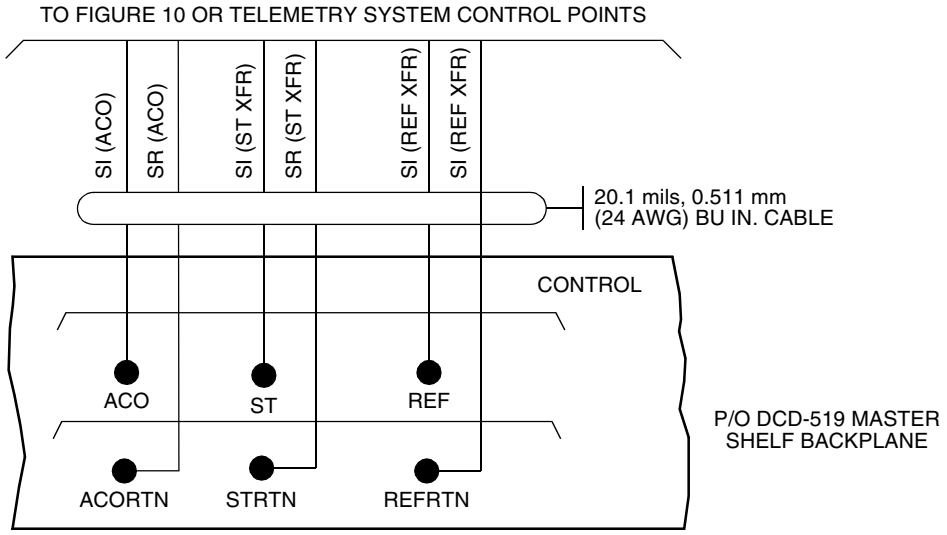



FIGURE 6.
MASTER SHELF CONTROL LEADS
(ENG. NOTES 1 AND 2)

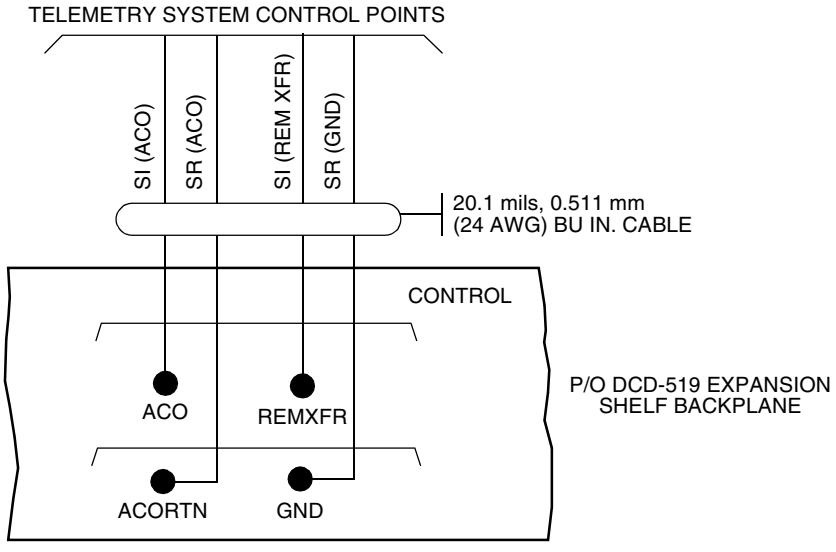



FIGURE 7.
EXPANSION SHELF CONTROL LEADS
(ENG. NOTES 1 AND 2)

STATUS AND ALARM INDICATOR CONNECTIONS

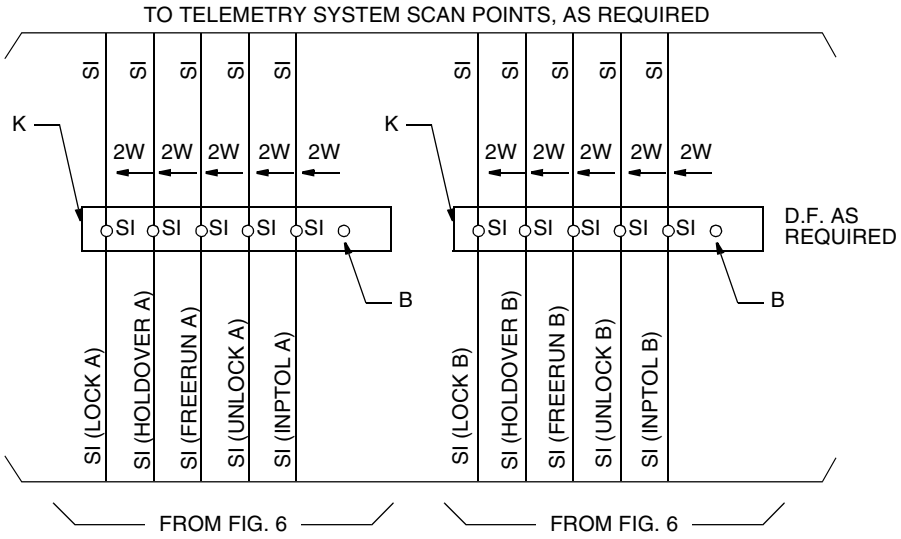



FIGURE 8.
FRAME TERMINATION CLOCK STATUS LEADS

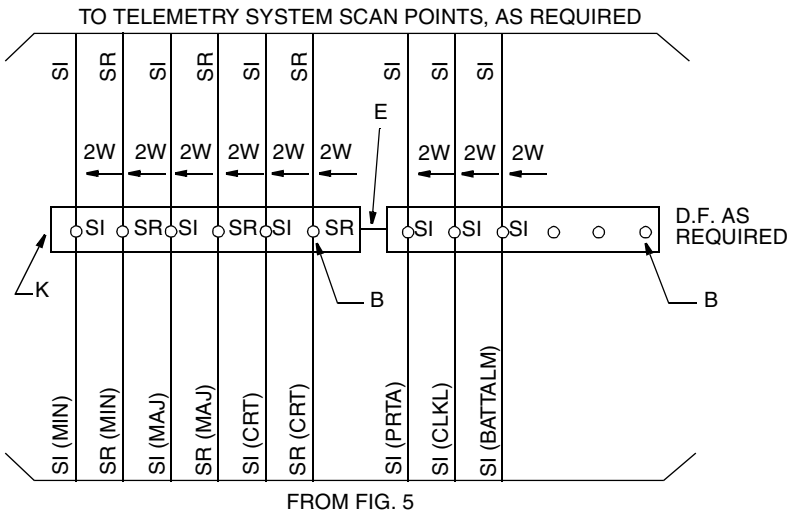



FIGURE 9.
FRAME TERMINATION SHELF STATUS LEADS

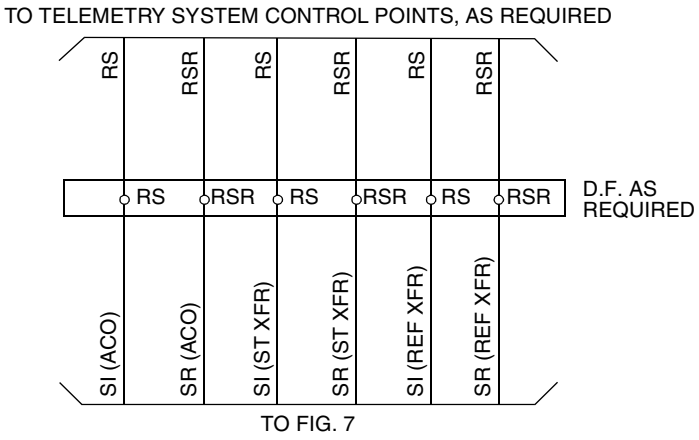
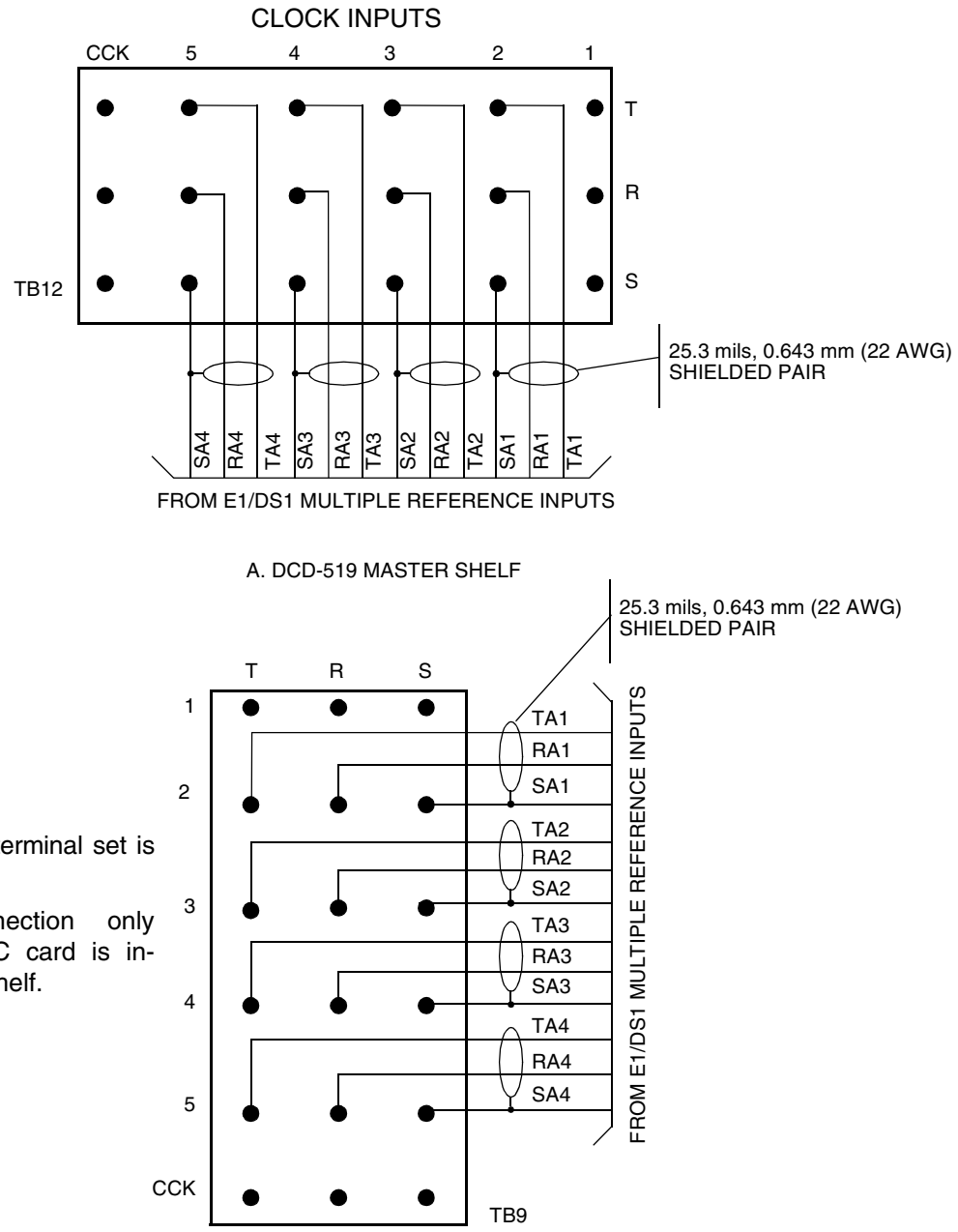


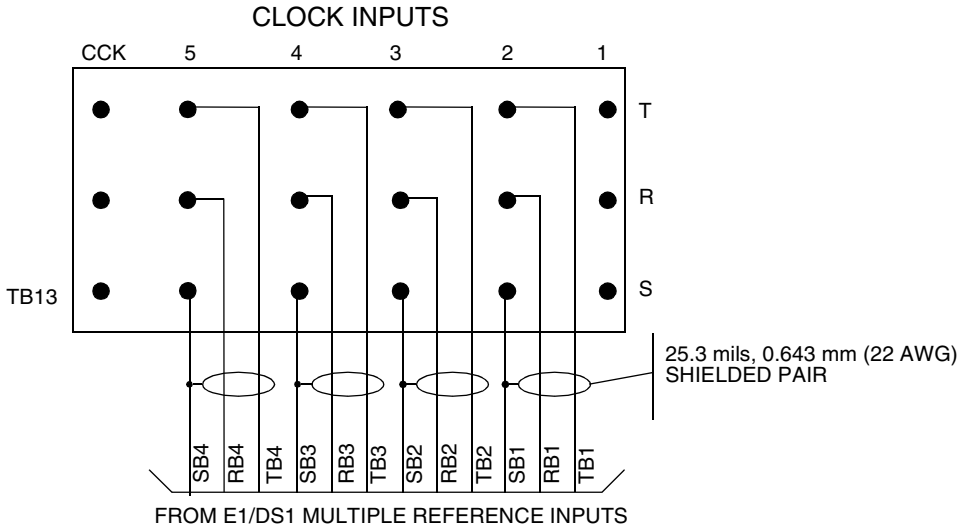

FIGURE 10.
FRAME TERMINATION SHELF CONTROL LEADS



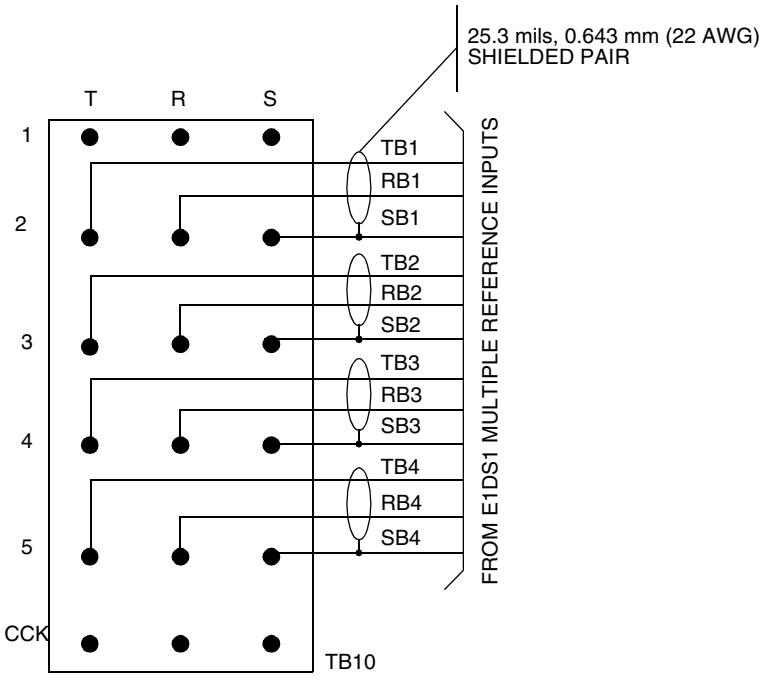

Notes:

1. Clock Input 1 terminal set is not used.
2. Provide connection only when an MRC card is installed in the shelf.

FIGURE 11.
INPUT A FOR MULTIPLE REF. E1/DS1 SOURCE
(ENG. NOTES 3, 5, AND 20)



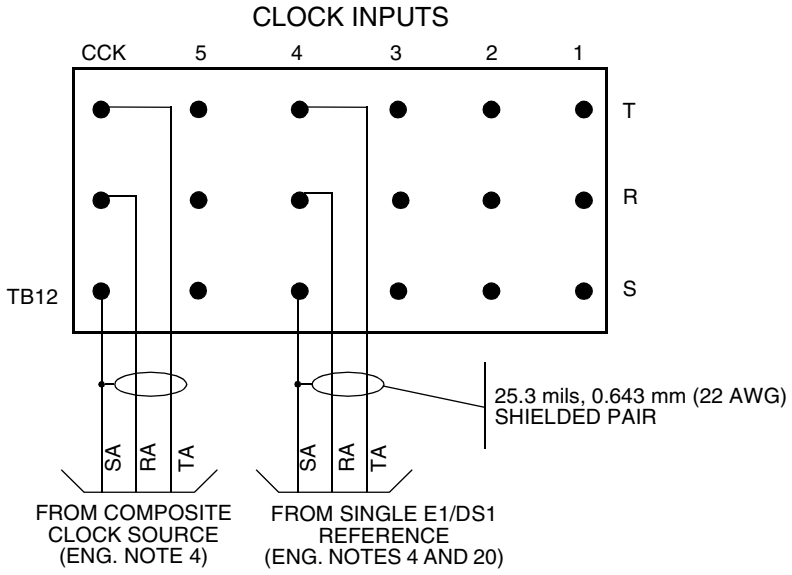

A. DCD-519 MASTER SHELF




B. DCD-519 EXPANSION SHELF

Notes:
1. Clock Input 1 terminal set is not used.
2. Provide connection only when an MRC card is installed in the shelf.

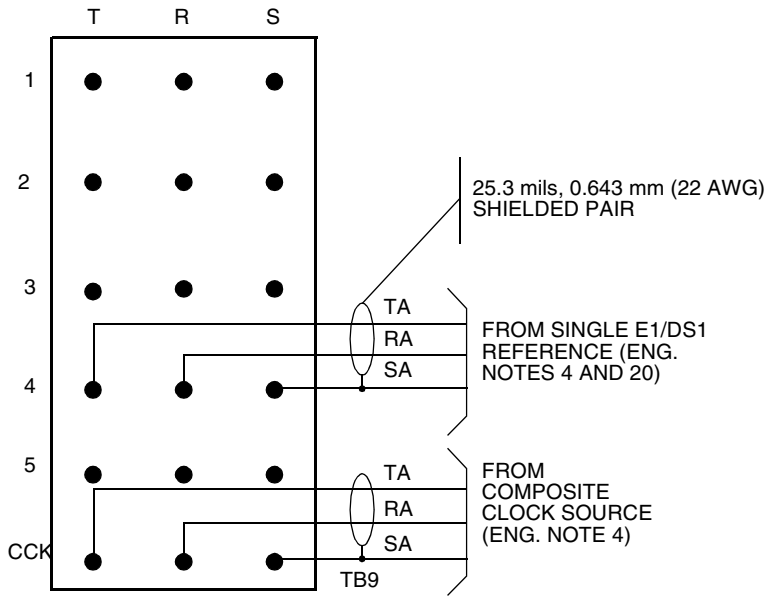
FIGURE 12.
INPUT B FOR MULTIPLE REF. E1/DS1 SOURCE
(ENG. NOTES 3, 4, 5, AND 20)




A. DCD-519 MASTER SHELF

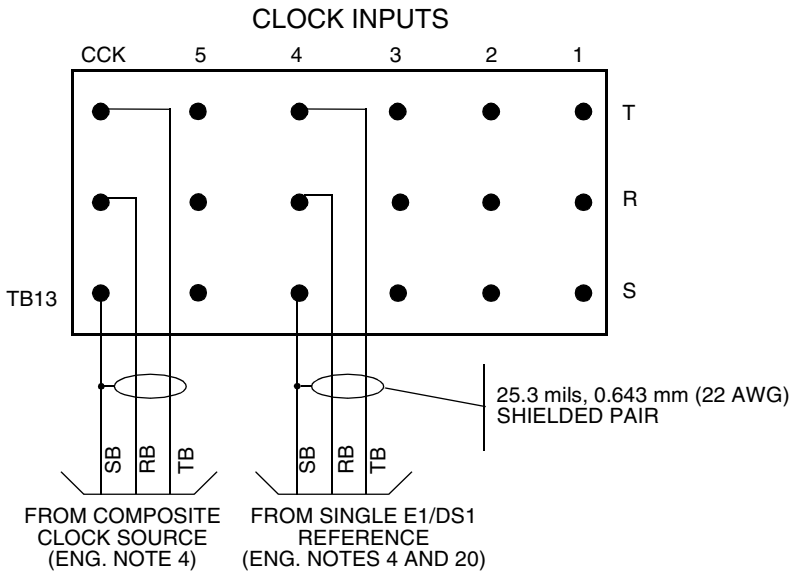
Notes:

1. Use Terminal Set 4 for single E1/DS1 reference. Sets 1, 2, 3, and 5 are not used for single reference.
2. Composite clock reference is from TOCA card output on master DCD System in the same building.

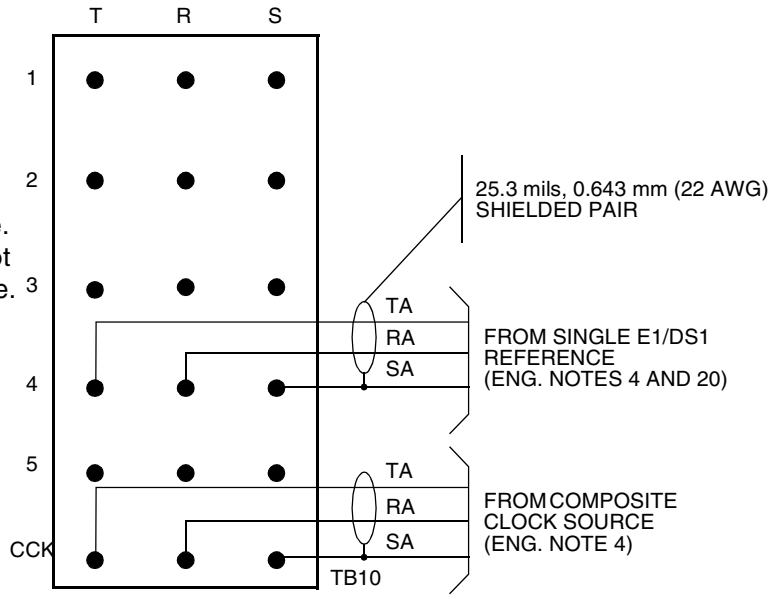



B. DCD-519 EXPANSION SHELF

FIGURE 13.
INPUT A FOR E1/DS1 OR COMPOSITE CLOCK
(ENG. NOTES 4 AND 20)




A. DCD-519 MASTER SHELF

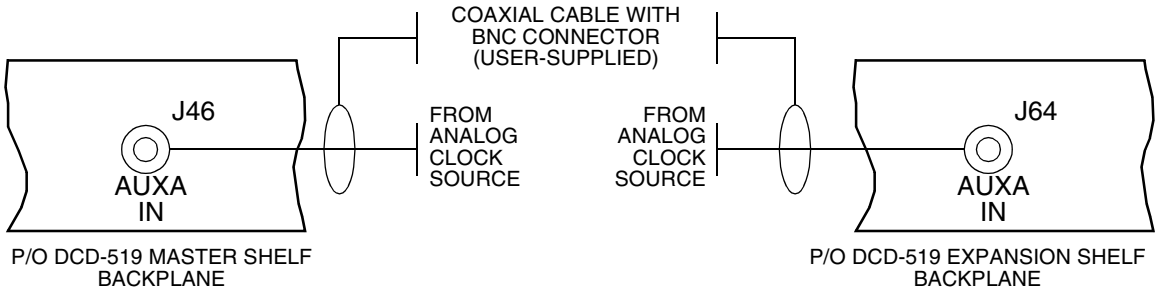



B. DCD-519 EXPANSION SHELF

Notes:

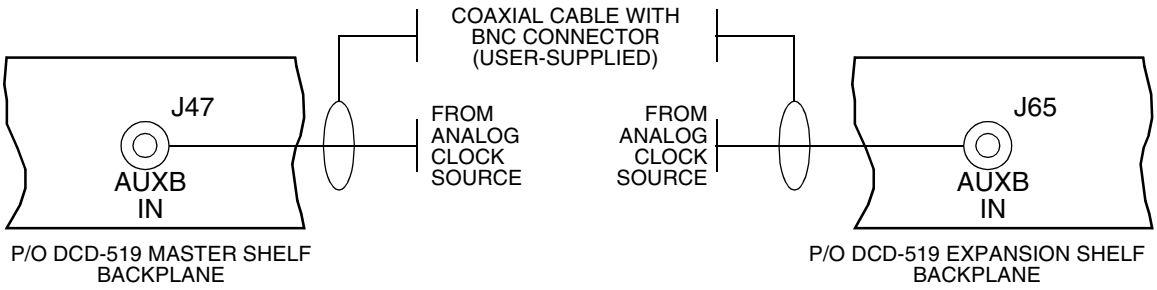
1. Use Terminal Set 4 for single E1/DS1 reference. Sets 1, 2, 3, and 5 are not used for single reference.
2. Composite clock reference is from TOCA card output on master DCD system (SSU) in the same building.

FIGURE 14.
INPUT B FOR E1/DS1 OR COMPOSITE CLOCK
(ENG. NOTES 4 AND 20)




Note: Provide connection only when an ACI card is installed in the shelf.

FIGURE 15.
INPUT A ANALOG CLOCK




Note: Provide connection only when an ACI card is installed in the shelf.

FIGURE 16.
INPUT B ANALOG CLOCK

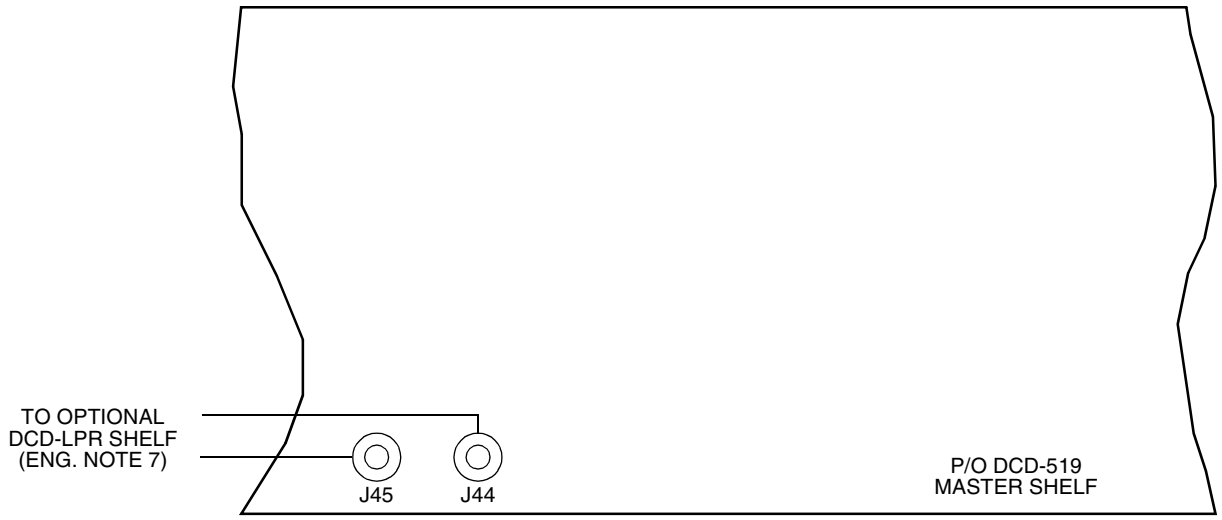



FIGURE 17.
RUBIDIUM 5 MHZ OUTPUTS

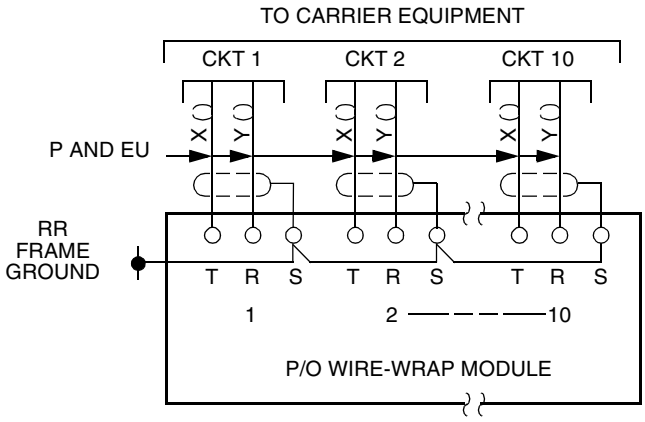
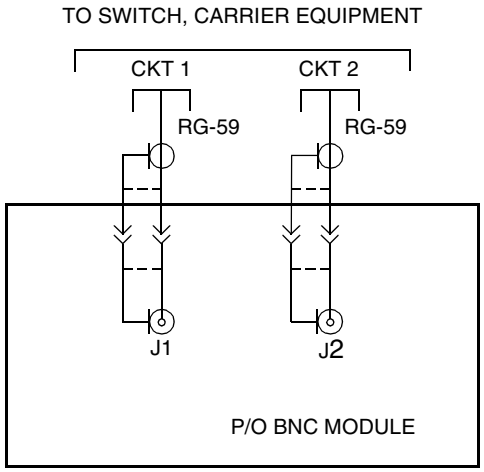
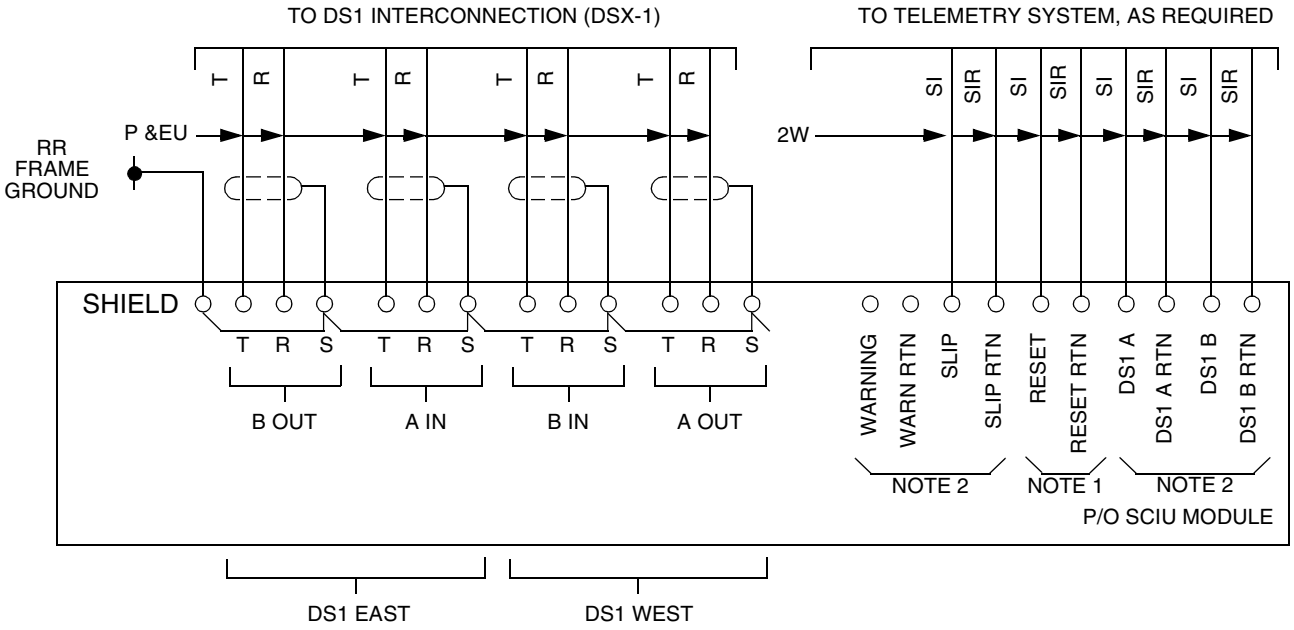



FIGURE 18.
TIMING OUTPUT INTERCONNECTIONS – WIRE-WRAP MODULE
(ENG. NOTES 9 THROUGH 13)




Note: The shield of each connector is routed to frame ground via the top mounting screw.

FIGURE 19.
TIMING OUTPUT INTERCONNECTIONS – 2-PORT BNC MODULE
(FOR TOAA CARD)




Notes:
1. Connect to telemetry control points, as required.
2. Connect to telemetry scan point, as required.

FIGURE 20.
TIMING OUTPUT INTERCONNECTIONS - SCIU OUTPUT MODULE

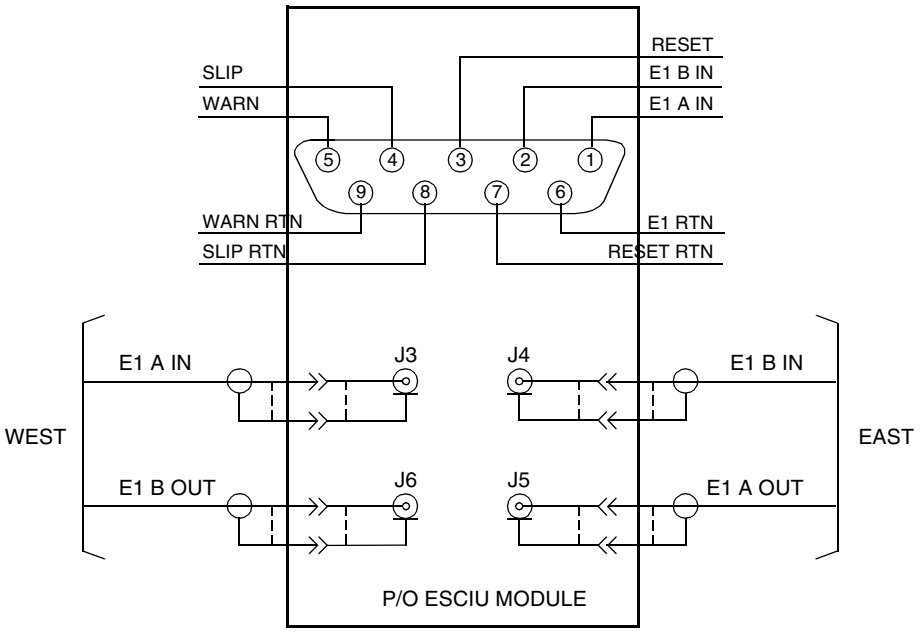



FIGURE 21.
TIMING OUTPUT INTERCONNECTIONS - ESCIU MODULE
(SEE ENG. NOTES 10, 11, 12, AND 13)

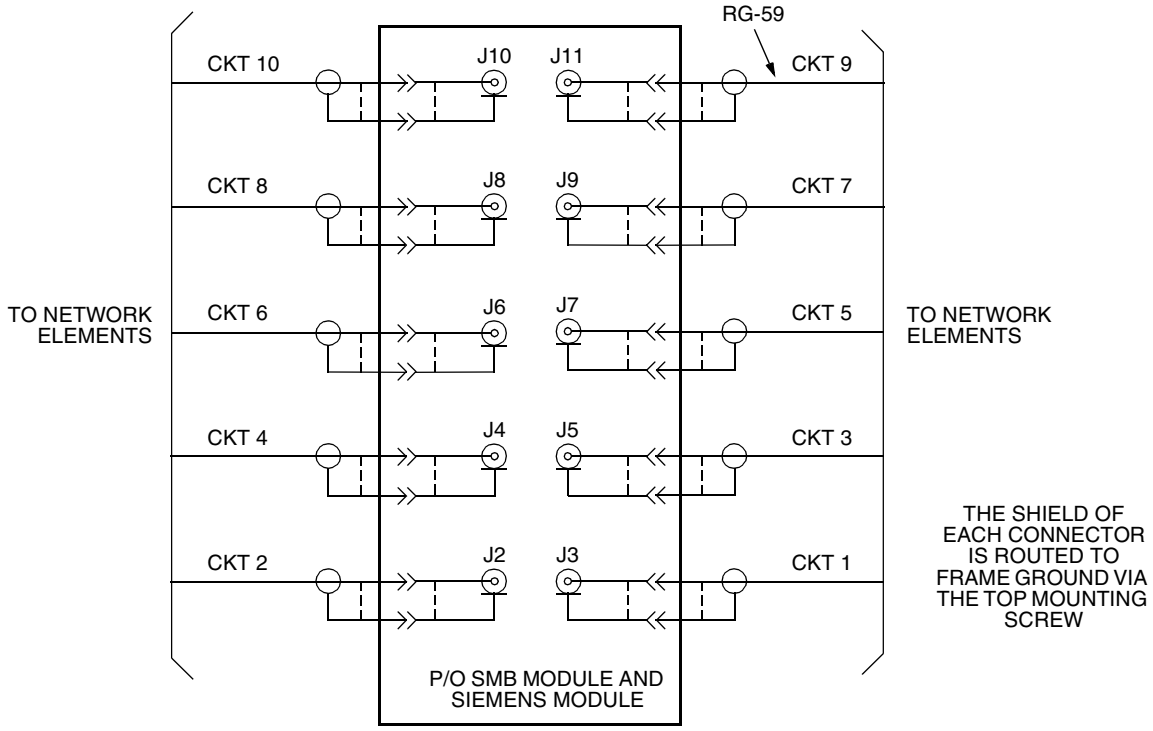
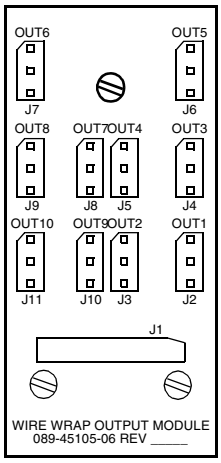
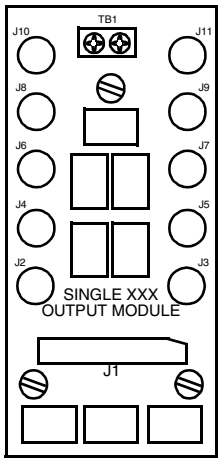


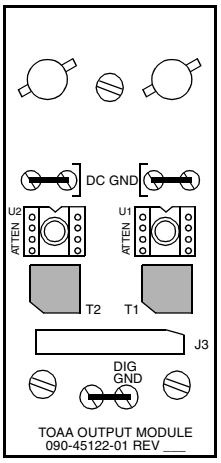

FIGURE 22.
TIMING OUTPUT INTERCONNECTIONS - SMB AND SIEMENS OUTPUT MODULES



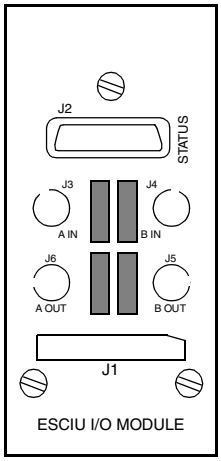

Wire-wrap Module
p/n 990-45105-06



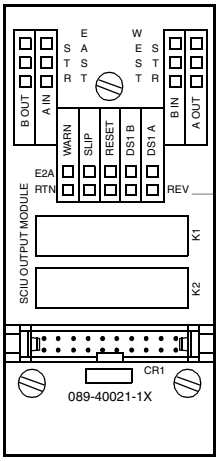

See Note 2




2-Port BNC Module
p/n 990-45122-01




ESCIU Module
p/n 990-45021-11

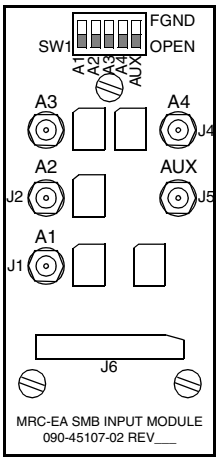



SCIU Wire-wrap Module
p/n 990-40021-10

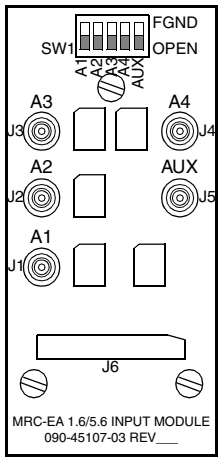
Notes:

1. The part numbers listed are the ordering part numbers and may differ from the number on the modules.
2. The SMB Output Modules (p/n 990-45105-02), the Siemens 1.6/5.6 (p/n 990-45105-03), and the Siemens 1.0/2.3 (p/n 990-45105-04) RF Connector Modules are similar in appearance.

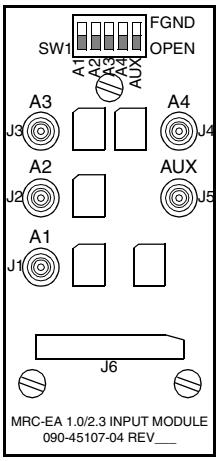
FIGURE 23.
OUTPUT MODULES
(ENG. NOTES 13 AND 18)
(Manufacturing Discontinued – See FIGURES 34, 36, 37, 38, 39)



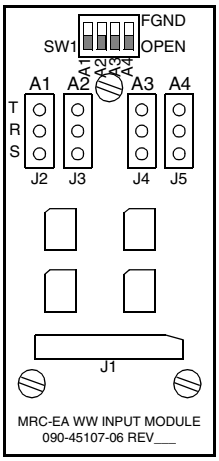

SMB Input Module p/n 990-45107-02




Siemens 1.6/5.6 Input Module p/n 990-45107-03




Siemens 1.0/2.3 Input Module p/n 990-45107-04

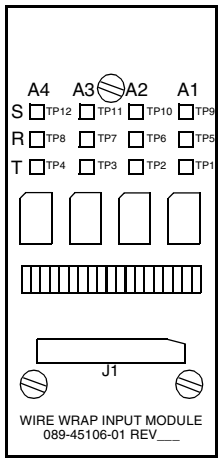



Wire-wrap Input Module p/n 990-45107-06

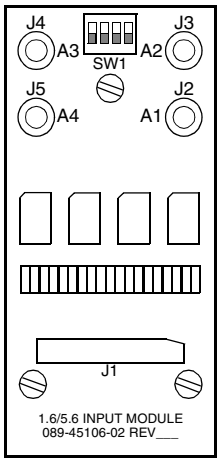
Note: The part numbers listed are the ordering part numbers and may differ from the number on the

Notes:
1. There are two versions of this module; refer to TABLE B for more information.
2. There are four versions of this module; refer to TABLE B for more information.
3. Siemens 1.6/5.6 Connector Reference Input Module (990-45104-06) and Siemens 1.0/2.3 Connector Reference Input Module (990-45104-07) are identical; the difference lies in the connector size.

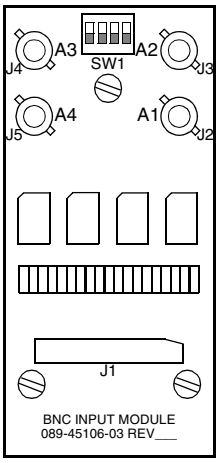
FIGURE 24.
REFERENCE INPUT MODULES
(ENG. NOTES 13 AND 19)
(Manufacturing Discontinued – See FIGURE 40)



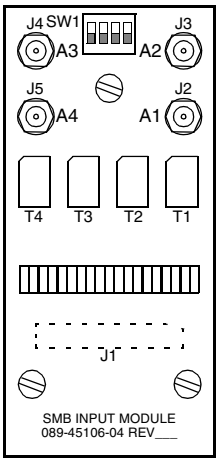

Wire-wrap Input Module
p/n 990-45106-01




Siemens 1.6/5.6 Input Module
p/n 990-45106-02




BNC Input Module
p/n 990-45106-03




SMB Input Module
p/n 990-45106-04

Note: The part numbers listed are the ordering part numbers and may differ from the numbers on the modules.

FIGURE 25.
PSM CARD INPUT MODULES
(Manufacturing Discontinued – See FIGURE 41)

TIMING CLOCK OUTPUT RECORDS (MMP)
(SEE ENG. NOTES 12 AND 13)

TABLE I.
WIRE-WRAP MODULE CONNECTIONS
(TOCA, TOTA, TOTA-2)

| TOCA/TOTA/ TOTA-2 OUTPUTS | | DESTINATION | |
|---|---|---|---|
| PORT | LEAD | EQUIPMENT | LEAD |
| 1 | T | | X ( ) |
| | R | | Y ( ) |
| 2 | T | | X ( ) |
| | R | | Y ( ) |
| 3 | T | | X ( ) |
| | R | | Y ( ) |
| 4 | T | | X ( ) |
| | R | | Y ( ) |
| 5 | T | | X ( ) |
| | R | | Y ( ) |
| 6 | T | | X ( ) |
| | R | | Y ( ) |
| 7 | T | | X ( ) |
| | R | | Y ( ) |
| 8 | T | | X ( ) |
| | R | | Y ( ) |
| 9 | T | | X ( ) |
| | R | | Y ( ) |
| 10 | T | | X ( ) |
| | R | | Y ( ) |
| 11 | T | | X ( ) |
| | R | | Y ( ) |
| 12 | T | | X ( ) |
| | R | | Y ( ) |
| 13 | T | | X ( ) |
| | R | | Y ( ) |

TABLE J.
ESCIU/SCIU MODULE CONNECTIONS
(ENG. NOTE 11)

| ESCIU/SCIU OUTPUTS | | DESTINATION | |
|---|---|---|---|
| FUNCTION | LEAD | EQUIPMENT | LEAD |
| 1 | | | X ( ) |
| | | | Y ( ) |
| 2 | | | X ( ) |
| | | | Y ( ) |
| 3 | | | X ( ) |
| | | | Y ( ) |
| 4 | | | X ( ) |
| | | | Y ( ) |

TABLE K.
SMB MODULE CONNECTIONS
(TOGA, TOEA, TO-EA)

| TOGA, TOEA, TO-EA OUTPUTS | | DESTINATION |
|---|---|---|
| PORT | CONNECTOR | EQUIPMENT |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |

TABLE L.
SIEMENS 1.6/5.6 RF MODULE CONNECTIONS
(TOGA, TOEA, TO-EA)

| TOGA, TOEA, TO-EA OUTPUTS | | DESTINATION |
|---|---|---|
| PORT | CONNECTOR | EQUIPMENT |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |

TABLE M.
DCD-519 EXPANSION SHELF WIRE-WRAP MODULE
TIMING OUTPUT RECORD

| DCD OUTPUTS | | | DESTINATION | |
|---|---|---|---|---|
| TIMING OUTPUT UNIT | OUTPUT | LEAD | EQUIPMENT | LEAD |
| TO1 | 1 | T | | X ( ) |
| | | R | | Y ( ) |
| | 2 | T | | X ( ) |
| | | R | | Y ( ) |
| | 3 | T | | X ( ) |
| | | R | | Y ( ) |
| | 4 | T | | X ( ) |
| | | R | | Y ( ) |
| | 5 | T | | X ( ) |
| | | R | | Y ( ) |
| | 6 | T | | X ( ) |
| | | R | | Y ( ) |
| | 7 | T | | X ( ) |
| | | R | | Y ( ) |
| | 8 | T | | X ( ) |
| | | R | | Y ( ) |
| | 9 | T | | X ( ) |
| | | R | | Y ( ) |
| | 10 | T | | X ( ) |
| | | R | | Y ( ) |

TABLE M. (CONT'D)
DCD-519 EXPANSION SHELF WIRE-WRAP MODULE
TIMING OUTPUT RECORD

| DCD OUTPUTS | | | DESTINATION | |
|---|---|---|---|---|
| TIMING OUTPUT UNIT | OUTPUT | LEAD | EQUIPMENT | LEAD |
| TO2 | 1 | T | | X ( ) |
| | | R | | Y ( ) |
| | 2 | T | | X ( ) |
| | | R | | Y ( ) |
| | 3 | T | | X ( ) |
| | | R | | Y ( ) |
| | 4 | T | | X ( ) |
| | | R | | Y ( ) |
| | 5 | T | | X ( ) |
| | | R | | Y ( ) |
| | 6 | T | | X ( ) |
| | | R | | Y ( ) |
| | 7 | T | | X ( ) |
| | | R | | Y ( ) |
| | 8 | T | | X ( ) |
| | | R | | Y ( ) |
| | 9 | T | | X ( ) |
| | | R | | Y ( ) |
| | 10 | T | | X ( ) |
| | | R | | Y ( ) |

TABLE M. (CONT'D)
DCD-519 EXPANSION SHELF WIRE-WRAP MODULE
TIMING OUTPUT RECORD

| DCD OUTPUTS | | | DESTINATION | |
|---|---|---|---|---|
| TIMING OUTPUT UNIT | OUTPUT | LEAD | EQUIPMENT | LEAD |
| TO3 | 1 | T | | X ( ) |
| | | R | | Y ( ) |
| | 2 | T | | X ( ) |
| | | R | | Y ( ) |
| | 3 | T | | X ( ) |
| | | R | | Y ( ) |
| | 4 | T | | X ( ) |
| | | R | | Y ( ) |
| | 5 | T | | X ( ) |
| | | R | | Y ( ) |
| | 6 | T | | X ( ) |
| | | R | | Y ( ) |
| | 7 | T | | X ( ) |
| | | R | | Y ( ) |
| | 8 | T | | X ( ) |
| | | R | | Y ( ) |
| | 9 | T | | X ( ) |
| | | R | | Y ( ) |
| | 10 | T | | X ( ) |
| | | R | | Y ( ) |

TABLE M. (CONT'D)
DCD-519 EXPANSION SHELF WIRE-WRAP MODULE
TIMING OUTPUT RECORD

| DCD OUTPUTS | | | DESTINATION | |
|---|---|---|---|---|
| TIMING OUTPUT UNIT | OUTPUT | LEAD | EQUIPMENT | LEAD |
| TO4 | 1 | T | | X ( ) |
| | | R | | Y ( ) |
| | 2 | T | | X ( ) |
| | | R | | Y ( ) |
| | 3 | T | | X ( ) |
| | | R | | Y ( ) |
| | 4 | T | | X ( ) |
| | | R | | Y ( ) |
| | 5 | T | | X ( ) |
| | | R | | Y ( ) |
| | 6 | T | | X ( ) |
| | | R | | Y ( ) |
| | 7 | T | | X ( ) |
| | | R | | Y ( ) |
| | 8 | T | | X ( ) |
| | | R | | Y ( ) |
| | 9 | T | | X ( ) |
| | | R | | Y ( ) |
| | 10 | T | | X ( ) |
| | | R | | Y ( ) |

TABLE M. (CONT'D)
DCD-519 EXPANSION SHELF WIRE-WRAP MODULE
TIMING OUTPUT RECORD

| DCD OUTPUTS | | | DESTINATION | |
|---|---|---|---|---|
| TIMING OUTPUT UNIT | OUTPUT | LEAD | EQUIPMENT | LEAD |
| TO5 | 1 | T | | X ( ) |
| | | R | | Y ( ) |
| | 2 | T | | X ( ) |
| | | R | | Y ( ) |
| | 3 | T | | X ( ) |
| | | R | | Y ( ) |
| | 4 | T | | X ( ) |
| | | R | | Y ( ) |
| | 5 | T | | X ( ) |
| | | R | | Y ( ) |
| | 6 | T | | X ( ) |
| | | R | | Y ( ) |
| | 7 | T | | X ( ) |
| | | R | | Y ( ) |
| | 8 | T | | X ( ) |
| | | R | | Y ( ) |
| | 9 | T | | X ( ) |
| | | R | | Y ( ) |
| | 10 | T | | X ( ) |
| | | R | | Y ( ) |

TABLE M. (CONT'D)
DCD-519 EXPANSION SHELF WIRE-WRAP MODULE
TIMING OUTPUT RECORD

| DCD OUTPUTS | | | DESTINATION | |
|---|---|---|---|---|
| TIMING OUTPUT UNIT | OUTPUT | LEAD | EQUIPMENT | LEAD |
| TO6 | 1 | T | | X ( ) |
| | | R | | Y ( ) |
| | 2 | T | | X ( ) |
| | | R | | Y ( ) |
| | 3 | T | | X ( ) |
| | | R | | Y ( ) |
| | 4 | T | | X ( ) |
| | | R | | Y ( ) |
| | 5 | T | | X ( ) |
| | | R | | Y ( ) |
| | 6 | T | | X ( ) |
| | | R | | Y ( ) |
| | 7 | T | | X ( ) |
| | | R | | Y ( ) |
| | 8 | T | | X ( ) |
| | | R | | Y ( ) |
| | 9 | T | | X ( ) |
| | | R | | Y ( ) |
| | 10 | T | | X ( ) |
| | | R | | Y ( ) |

TABLE M. (CONT'D)
DCD-519 EXPANSION SHELF WIRE-WRAP MODULE
TIMING OUTPUT RECORD

| DCD OUTPUTS | | | DESTINATION | |
|---|---|---|---|---|
| TIMING OUTPUT UNIT | OUTPUT | LEAD | EQUIPMENT | LEAD |
| TO7 | 1 | T | | X ( ) |
| | | R | | Y ( ) |
| | 2 | T | | X ( ) |
| | | R | | Y ( ) |
| | 3 | T | | X ( ) |
| | | R | | Y ( ) |
| | 4 | T | | X ( ) |
| | | R | | Y ( ) |
| | 5 | T | | X ( ) |
| | | R | | Y ( ) |
| | 6 | T | | X ( ) |
| | | R | | Y ( ) |
| | 7 | T | | X ( ) |
| | | R | | Y ( ) |
| | 8 | T | | X ( ) |
| | | R | | Y ( ) |
| | 9 | T | | X ( ) |
| | | R | | Y ( ) |
| | 10 | T | | X ( ) |
| | | R | | Y ( ) |

TABLE M. (CONT'D)
DCD-519 EXPANSION SHELF WIRE-WRAP MODULE
TIMING OUTPUT RECORD

| DCD OUTPUTS | | | DESTINATION | |
|---|---|---|---|---|
| TIMING OUTPUT UNIT | OUTPUT | LEAD | EQUIPMENT | LEAD |
| TO8 | 1 | T | | X ( ) |
| | | R | | Y ( ) |
| | 2 | T | | X ( ) |
| | | R | | Y ( ) |
| | 3 | T | | X ( ) |
| | | R | | Y ( ) |
| | 4 | T | | X ( ) |
| | | R | | Y ( ) |
| | 5 | T | | X ( ) |
| | | R | | Y ( ) |
| | 6 | T | | X ( ) |
| | | R | | Y ( ) |
| | 7 | T | | X ( ) |
| | | R | | Y ( ) |
| | 8 | T | | X ( ) |
| | | R | | Y ( ) |
| | 9 | T | | X ( ) |
| | | R | | Y ( ) |
| | 10 | T | | X ( ) |
| | | R | | Y ( ) |

TABLE N.
MODULES FOR CLOCK INPUT CARDS
(Manufacturing Discontinued—See Table T)

| FOR INPUT CARD | USE INPUT MODULE | | | | |
|---|---|---|---|---|---|
| | PART NUMBER | CONNECTOR TYPE | IMPEDANCE | INPUT SIGNAL LEVEL | NO. OF INPUTS |
| ACI (Connect input at AUX or A5 only) (SW4 and SW5 at BRDG only) | 990-45107-02 | SMB | 75 ¾ (unbalanced) | 0.3 V to 1.5 V rms | 4 + AUX |
| | 990-45107-03 | Siemens 1.6/5.6 | 75 ¾ (unbalanced) | 0.3 V to 1.5 V rms | 4 + AUX |
| | 990-45107-04 | Siemens 1.0/2.3 | 75 ¾ (unbalanced) | 0.3 V to 1.5 V rms | 5 |
| CI (Connect inputs at A3 only) (SW4 and SW5 at TERM or BRDG) | 990-45107-06 | Wire-wrap | T1: 100 ¾ (balanced)<br>CC: 133 ¾ (balanced) | TERM: T1: 1.0 to 3.5 V b-p<br>BRDG: T1: 0.1 to 0.35 V b-p<br>BRDG: CC: 1.5 to 4.0 V p-p | 4 |
| CI-EA (Connect inputs at A3 only) (SW4 and SW5 at TERM or BRDG) | 990-45107-02 | SMB | 75 ¾ (unbalanced) | TERM: E1: 1.0 to 3.5 V b-p<br>BRDG: E1: 0.1 to 0.35 V b-p<br>BRDG: Analog: 1.5 to 3.0 V p-p | 4 + AUX |
| | 990-45107-03 | Siemens 1.6/5.6 | 75 ¾ (unbalanced) | TERM: E1: 1.0 to 3.5 V b-p<br>BRDG: E1: 0.1 to 0.35 V b-p<br>BRDG: Analog: 1.5 to 3.0 V p-p | 4 + AUX |
| | 990-45107-04 | Siemens 1.0/2.3 | 75 ¾ (unbalanced) | TERM: E1: 1.0 to 3.5 V b-p<br>BRDG: E1: 0.1 to 0.35 V b-p<br>BRDG: Analog: 1.5 to 3.0 V p-p | 5 |
| | 990-45107-06 | Wire-wrap | 120 ¾ (balanced) | TERM: E1: 1.0 to 3.5 V b-p<br>BRDG: E1: 0.1 to 0.35 V b-p | 4 |

TABLE N.
MODULES FOR CLOCK INPUT CARDS (CONT'D)
(Manufacturing Discontinued—See Table T)

| FOR INPUT CARD | USE INPUT MODULE | | | | |
|---|---|---|---|---|---|
| | PART NUMBER | CONNECTOR TYPE | IMPEDANCE | INPUT SIGNAL LEVEL | NO. OF INPUTS |
| MRC-E<br>MRC-EA<br>Standard MRC-EA<br>(Connect all inputs to A1 through A4)<br>(SW4 and SW5 at BRDG only) | 990-45107-02 | SMB | 75 ¾ (unbalanced) | E1 and analog: 0.1 to 3.5 V b-p | 4 + AUX |
| | 990-45107-03 | Siemens 1.6/5.6 | 75 ¾ (unbalanced) | E1 and analog: 0.1 to 3.5 V b-p | 4 + AUX |
| | 990-45107-04 | Siemens 1.0/2.3 | 75 ¾ (unbalanced) | E1 and analog: 0.1 to 3.5 V b-p | 5 |
| | 990-45107-06 | Wire-wrap | 120 ¾ (balanced) | E1 and analog: 0.1 to 3.5 V b-p | 4 |

Notes:
1. Part numbers shown are for ordering purposes; part numbers on modules start with 089 instead of 990.
2. MRC-T cards cannot use input modules. Connect inputs for all MRC-T cards directly to TB12 and TB13, rows 2 through 5, on the DCD rear panel.

TABLE O.
MODULES FOR PSM CARDS

| FOR INPUT CARD | USE INPUT MODULE | | | | |
|---|---|---|---|---|---|
| | PART NUMBER | CONNECTOR TYPE | IMPEDANCE | INPUT SIGNAL LEVEL | NO. OF INPUTS |
| PSM-T<br>Standard PSM-T | 990-45106-11 | Wire-wrap<br>(Note 2) | 120 ¾<br>(balanced) | T1: 0.1 to 3.5 V b-p | 4 |
| PSM-E | 990-45106-12 | Siemens 1.6/5.6 | 75 ¾<br>(unbalanced) | E1: 0.1 to 3.5 V b-p | 4 |
| PSM-E (Issue A) | 990-45106-11 | Wire-wrap<br>(Note 2) | 120 ¾<br>(balanced) | E1: 0.1 to 3.5 V b-p | 4 |
| | 990-45106-13 | BNC | 75 ¾<br>(unbalanced) | E1: 0.1 to 3.5 V b-p | 4 |
| | 990-45106-14 | Siemens 1.6/5.6 | 75 ¾<br>(unbalanced) | E1: 0.1 to 3.5 V b-p | 4 |
| Standard PSM-E<br>Standard PSM-EA | 990-45106-11 | Wire-wrap<br>(Note 2) | 120 ¾<br>(balanced) | E1: 0.1 to 3.5 V b-p | 4 |
| | 990-45106-12 | Siemens 1.6/5.6 | 75 ¾<br>(unbalanced) | E1 and analog: 0.1 to 3.5 V b-p | 4 |
| | 990-45106-13 | BNC | 75 ¾<br>(unbalanced) | E1 and analog: 0.1 to 3.5 V b-p | 4 |
| | 990-45106-14 | SMB | 75 ¾<br>(unbalanced) | E1 and analog: 0.1 to 3.5 V b-p | 4 |
| | 990-45106-15 | Siemens 1.0/2.3 | 75 ¾<br>(unbalanced) | E1 and analog: 0.1 to 3.5 V b-p | 4 |

Notes:
1. DCD rear panel switches SW4 and SW5 must be in the BRDG position.
2. Use this module for E1 or T1 signals only.
3. Part numbers shown are for ordering purposes; part numbers on modules start with 089 instead of 990.

TABLE P.
MODULES FOR TIMING OUTPUT CARDS
(Manufacturing Discontinued—See Table U)

| FOR OUTPUT CARD | USE MODULE | | | | |
|---|---|---|---|---|---|
| | PROTECTION TYPE | USE PART NUMBER: | CONNECTOR TYPE | IMPEDANCE | NO. OF OUTPUTS |
| SCIU | Stand-alone | 090-45021-10 | Wire-wrap (Note 1) | 100 ¾ (balanced) | I/O for 2-way T1 |
| ESCIU | Stand-alone | 090-45021-11 | SMB | 75 ¾ (unbalanced) | I/O for 2-way E1 |
| | | 090-45021-12 | Siemens 1.6/5.6 | 75 ¾ (unbalanced) | I/O for 2-way E1 |
| EA10 | Stand-alone | 990-45105-06 | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 |
| | | 990-45105-13 | SMB | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-14 | Siemens 1.6/5.6 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-15 | Siemens 1.0/2.3 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45108-01 | Wire-wrap (Note 1) | E1: 120 ¾ Analog: 75 ¾ (balanced) | 10 (11, 12, 13 not used) |
| | 1:1, 1+1 | 990-45105-10 (double-wide) | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 |
| | | 990-45105-11 (double-wide) | Wire-wrap or Siemens 1.6/5.6 | E1: 120 ¾ (balanced) or E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-16 (double-wide) | SMB | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-17 (double-wide) | Siemens 1.6/5.6 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-18 (double-wide) | Siemens 1.0/2.3 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |

TABLE P.
MODULES FOR TIMING OUTPUT CARDS (CONT'D)
(Manufacturing Discontinued—See Table U)

| FOR OUTPUT CARD | USE MODULE | | | | |
|---|---|---|---|---|---|
| | PROTECTION TYPE | USE PART NUMBER: | CONNECTOR TYPE | IMPEDANCE | NO. OF OUTPUTS |
| TO-EA5 | Stand-alone | 990-45105-06 | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 |
| | | 990-45105-12 | Wire-wrap and Siemens 1.6/5.6 | E1: 120 ¾ (balanced) and E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 5 Wire-wrap and 5 Siemens 1.6/5.6 |
| | | 990-45105-13 | SMB | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-14 | Siemens 1.6/5.6 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-15 | Siemens 1.0/2.3 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45108-01 | Wire-wrap (Note 1) | E1: 120 ¾ Analog: 75 ¾ (balanced) | 10 (Do not use 11, 12, 13) |
| | 1:1, 1+1 | 990-45105-10 (double-wide) | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 |
| | | 990-45105-11 (double-wide) | Wire-wrap or Siemens 1.6/5.6 | E1: 120 ¾ (balanced) or E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 Wire-wrap or 10 Siemens 1.6/5.6 or combination |
| | | 990-45105-16 (double-wide) | SMB | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-17 (double-wide) | Siemens 1.6/5.6 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-18 (double-wide) | Siemens 1.0/2.3 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |

TABLE P.
MODULES FOR TIMING OUTPUT CARDS (CONT'D)
(Manufacturing Discontinued—See Table U)

| FOR OUTPUT CARD | USE MODULE | | | | |
|---|---|---|---|---|---|
| | PROTECTION TYPE | USE PART NUMBER: | CONNECTOR TYPE | IMPEDANCE | NO. OF OUTPUTS |
| TO-EA (Do not mix redundant and 1:N in the same shelf) | Stand-alone, 1:N | 990-45105-12 | Wire-wrap and Siemens 1.6/5.6 | E1: 120 ¾ Analog: 75 ¾ (balanced) and E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 5 Wire-wrap and 5 Siemens 1.6/5.6 |
| | | 990-45105-13 | SMB | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-14 | Siemens 1.6/5.6 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-15 | Siemens 1.0/2.3 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45108-01 | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 (Do not use 11, 12, 13) |
| | 1+1 | 990-45105-10 (double-wide) | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 |
| | | 990-45105-11 (double-wide) | Wire-wrap or Siemens 1.6/5.6 | E1: 120 ¾ (balanced) or E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 Wire-wrap or 10 Siemens 1.6/5.6 or combination |
| TOEA | Stand-alone, 1:N | 990-45105-12 | Wire-wrap and Siemens 1.6/5.6 | 120 ¾ (balanced) or 75 ¾ (unbalanced) | 5 Wire-wrap and 5 Siemens 1.6/5.6 |
| | | 990-45105-13 | SMB | E1: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-14 | Siemens 1.6/5.6 | E1: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-15 | Siemens 1.0/2.3 | E1: 75 ¾ (unbalanced) | 10 |
| | | 990-45108-01 | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 (Do not use 11, 12, 13) |

TABLE P.
MODULES FOR TIMING OUTPUT CARDS (CONT'D)
(Manufacturing Discontinued—See Table U)

| FOR OUTPUT CARD | USE MODULE | | | | |
|---|---|---|---|---|---|
| | PROTECTION TYPE | USE PART NUMBER: | CONNECTOR TYPE | IMPEDANCE | NO. OF OUTPUTS |
| TOGA (Do not mix 1+1 and 1:N in the same shelf) | 1:N, 1+1, Stand-alone | 990-45105-12 | Wire-wrap and Siemens 1.6/5.6 | Analog: 75 ¾ (unbalanced) | 5 Wire-wrap and 5 Siemens 1.6/5.6 |
| | | 990-45105-13 | SMB | Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-14 | Siemens 1.6/5.6 | Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-15 | Siemens 1.0/2.3 | Analog: 75 ¾ (unbalanced) | 10 |
| | 1+1 | 990-45105-16 (double-wide) | SMB | Analog: 75 ¾ (unbalanced) | 10 |
| TOCA | 1:N, Stand-alone | 990-45105-06 | Wire-wrap (Note 1) | CC: 133 ¾ (balanced) | 10 |
| | | 990-45108-01 | Wire-wrap (Note 1) | CC: 133 ¾ (balanced) | 10 (Do not use 11, 12, 13) |
| TOTA TOTL | 1:N, Stand-alone | 990-45105-06 | Wire-wrap (Note 1) | T1: 100 ¾ (balanced) | 10 |
| | | 990-45108-01 | Wire-wrap (Note 1) | T1: 100 ¾ (balanced) | 10 (Do not use 11, 12, 13) |
| TOLA | 1:N, Stand-alone | 990-45108-01 | Wire-wrap (Note 1) | RS-422: 100 ¾ (balanced) RS-423 (TTL): 450 ¾ (unbalanced) | 10 (Do not use 11, 12, 13) |
| TOTA-5 (Do not mix redundant and 1:N in the same shelf) | Stand-alone | 990-45105-06 | Wire-wrap (Note 1) | T1: 100 ¾ (balanced) | 10 |
| | 1:N, Stand-alone | 990-45108-01 | Wire-wrap (Note 1) | T1: 100 ¾ (balanced) | 10 (Do not use 11, 12, 13) |
| TOAA (except 090-40028-10) | 1:N, Stand-alone | 990-45122-01 | BNC | Analog: 75 ¾ (unbalanced) (includes 0, 3.0, 3.5, 30.0, 60.0 dB pads) | 2 |

TABLE P.
MODULES FOR TIMING OUTPUT CARDS (CONT'D)
(Manufacturing Discontinued—See Table U)

| FOR OUTPUT CARD | USE MODULE | | | | |
|---|---|---|---|---|---|
| | PROTECTION TYPE | USE PART NUMBER: | CONNECTOR TYPE | IMPEDANCE | NO. OF OUTPUTS |
| TOAA (090-40022-02) | 1:N, Stand-alone | 990-45122-01 | BNC | Analog: 50 ¾ (unbalanced) (includes 0, 3.0, 3.5, 30.0, 60.0 dB pads) | 2 |

Notes:
1. Use this module for E1 or T1 signals only.
2. Part numbers shown are for ordering purposes; part numbers on modules start with 089 instead of 990.

TABLE Q.
TIMING OUTPUT MODULES FOR CONNECTORLESS MODULAR MOUNTING PANELS
(Manufacturing Discontinued—See Table V)

| FOR OUTPUT CARD | USE MODULE | | | | |
|---|---|---|---|---|---|
| | PROTECTION TYPE | USE PART NUMBER: | CONNECTOR TYPE | IMPEDANCE | NO. OF OUTPUTS |
| TOAA (except 090-40028-10) | 1:N, Stand-alone | 990-40022-10 | BNC | Analog: 75 ¾ (unbalanced) (includes 0, 3.0, 3.5, 30.0, 60.0 dB pads) | 2 |
| TOAA (090-40022-02) | 1:N, Stand-alone | 990-40022-10 | BNC | Analog: 50 ¾ (unbalanced) (includes 0, 3.0, 3.5, 30.0, 60.0 dB pads) | 2 |
| TOCA | 1:N, Sand-alone | 990-40023-10 | DB9 | CC: 133 ¾ (balanced) | 5 |
| | | 990-40011-10 | Wire-wrap (Note 1) | CC: 133 ¾ (balanced) | 10 |
| TOEA TOGA | 1:N, Stand-alone | 990-40022-11 | BNC | E1 or Analog: 75 ¾ (unbalanced) | 10 |
| TOLA | 1:N, Stand-alone | 990-40023-10 | DB9 | TTL: 100 ¾ (balanced) | 5 |
| | | 990-40011-10 | Wire-wrap (Note 1) | TTL: 100 ¾ (balanced) | 10 |
| TOTA TOTA-5 TOTL | 1:N, Stand-alone | 990-40023-10 | DB9 | T1: 100 ¾ (balanced) | 5 |
| | | 990-40011-10 | Wire-wrap (Note 1) | T1: 100 ¾ (balanced) | 10 |
| SCIU | Stand-alone | 990-40021-10 | Wire-wrap (Note 1) | T1: 100 ¾ (balanced) | I/O for one SCIU card |
| ESCIU | Stand-alone | 990-40021-10 | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | I/O for one ESCIU card |

Notes:
1. Use this module for E1 or T1 signals only.
2. Part numbers shown are for ordering purposes; part numbers on modules start with 089 instead of 990.

TABLE R.
MASTER SHELF TO INTERFACE PANEL CABLING – REDUNDANT PROTECTION

| IF REDUNDANT CARDS INSTALLED IN SLOTS . . . | FROM MASTER SHELF UNPROTECTED OUTPUT CONNECTOR | TO INTERFACE PANEL CONNECTOR |
|---|---|---|
| TO1 AND TO2 | NOT RECOMMENDED | |
| TO2 AND TO3 | J22 AND J23 | TO1 AND TO2 |
| TO3 AND TO4 | NOT RECOMMENDED | |
| TO4 AND TO5 | J24 AND J25 | TO3 AND TO4 |
| TO5 AND TO6/HS1 | NOT RECOMMENDED | |
| TO6/HS1 AND HS2 | J26 AND J27 | TO5 AND TO6 |

TABLE S.
EXPANSION SHELF TO INTERFACE PANEL CABLING – REDUNDANT PROTECTION

| IF REDUNDANT CARDS INSTALLED IN SLOTS . . . | FROM MASTER SHELF UNPROTECTED OUTPUT CONNECTOR | TO INTERFACE PANEL CONNECTOR |
|---|---|---|
| TO1 AND TO2 | J26 AND J27 | TO1 AND TO2 |
| TO2 AND TO3 | NOT RECOMMENDED | |
| TO3 AND TO4 | J28 AND J29 | TO3 AND TO4 |
| TO4 AND TO5 | NOT RECOMMENDED | |
| TO5 AND TO6 | J30 AND J31 | TO5 AND TO6 |
| TO6 AND TO7 | NOT RECOMMENDED | |
| TO7 AND TO8 | J32 AND J33 | TO7 AND TO8 |
| TO8 AND HS1 | NOT RECOMMENDED | |
| HS1 AND HS2 (SEE NOTE) | J37 AND J38 | TO1 AND TO2 |
| NOTE: REQUIRES SECOND INTERFACE PANEL TO BE INSTALLED. | | |

TABLE T.
MODULES FOR CLOCK INPUT CARDS

| FOR INPUT CARD | USE INPUT MODULE | | | | |
|---|---|---|---|---|---|
| | PART NUMBER | CONNECTOR TYPE | IMPEDANCE | INPUT SIGNAL LEVEL | NO. OF INPUTS |
| ACI<br>(Connect input at AUX or A5 only)<br>(SW4 and SW5 at BRDG only)<br>(Note 1) | 990-45107-02 | SMB | 75 ¾ (unbalanced) | 0.3 V to 1.5 V rms (AUX only) | 4 + AUX |
| | 990-45107-03 | Siemens 1.6/5.6 | 75 ¾ (unbalanced) | 0.3 V to 1.5 V rms (AUX only) | 4 + AUX |
| | 990-45107-04 | Siemens 1.0/2.3 | 75 ¾ (unbalanced) | 0.3 V to 1.5 V rms (A5 only) | 5 |
| CI<br>(Connect inputs at A3 only)<br>(SW4 and SW5 at TERM or BRDG)<br>(Note 1) | 990-45107-06 | Wire-wrap | T1: 100 ¾ (balanced)<br>CC: 133 ¾ (balanced) | TERM: T1: 1.0 V to 3.5 V b-p (A3 only)<br>BRDG: T1: 0.1V to 0.35 V b-p<br>BRDG: CC: 1.5 V to 4.0 V p-p | 4 |
| CI-EA<br>(Connect inputs at A3, AUX, or A5 only)<br>(SW4 and SW5 at TERM or BRDG)<br>(Note 1) | 990-45107-02 | SMB | 75 ¾ (unbalanced) | TERM: E1: 1.0 V to 3.5 V b-p (A3 only)<br>BRDG: E1: 0.1 V to 0.35 V b-p (A3 only)<br>BRDG: Analog: 1.5 V to 3.0 V p-p (AUX only) | 4 + AUX |
| | 990-45107-03 | Siemens 1.6/5.6 | 75 ¾ (unbalanced) | TERM: E1: 1.0 V to 3.5 V b-p (A3 only)<br>BRDG: E1: 0.1 V to 0.35 V b-p (A3 only)<br>BRDG: Analog: 1.5 V to 3.0 V p-p (AUX only) | 4 + AUX |
| | 990-45107-04 | Siemens 1.0/2.3 | 75 ¾ (unbalanced) | TERM: E1: 1.0 V to 3.5 V b-p (A3 only)<br>BRDG: E1: 0.1 V to 0.35 V b-p (A3 only)<br>BRDG: Analog: 1.5 to 3.0 V p-p (A5 only) | 5 |
| | 990-45107-06 | Wire-wrap | 120 ¾ (balanced) | TERM: E1: 1.0 V to 3.5 V b-p (A3 only)<br>BRDG: E1: 0.1 V to 0.35 V b-p (A3 only) | 4 |

TABLE T.
MODULES FOR CLOCK INPUT CARDS (CONT'D)

| FOR INPUT CARD | USE INPUT MODULE | | | | |
|---|---|---|---|---|---|
| | PART NUMBER | CONNECTOR TYPE | IMPEDANCE | INPUT SIGNAL LEVEL | NO. OF INPUTS |
| MRC-E<br>MRC-EA<br>Standard MRC-EA<br>DCIM-EA<br>(Connect all inputs to A1 through A4)<br>(SW4 and SW5 at BRDG only)<br>(Notes 1 and 2) | 990-45107-02 | SMB | 75 ¾ (unbalanced) | E1 and analog: 0.1 V to 3.5 V b-p | 4 + AUX |
| | 990-45107-03 | Siemens 1.6/5.6 | 75 ¾ (unbalanced) | E1 and analog: 0.1 V to 3.5 V b-p | 4 + AUX |
| | 990-45107-04 | Siemens 1.0/2.3 | 75 ¾ (unbalanced) | E1 and analog: 0.1 V to 3.5 V b-p | 5 |
| | 990-45107-06 | Wire-wrap | 120 ¾ (balanced) | E1 and analog: 0.1 V to 3.5 V b-p | 4 |

Notes:
1. SW4 and SW5 are located on the DCD rear panel.
2. MRC-T cards cannot use input modules. Connect inputs for all MRC-T and DCIM-T cards directly to TB12 and TB13, rows 2 through 5, on the DCD rear panel.
3. Part numbers shown are for ordering purposes; part numbers on modules start with 089 instead of 990.

TABLE U.
MODULES FOR TIMING OUTPUT CARDS

| FOR OUTPUT CARD | USE MODULE | | | | |
|---|---|---|---|---|---|
| | PROTECTION TYPE | USE PART NUMBER: | CONNECTOR TYPE | IMPEDANCE | NO. OF OUTPUTS |
| SCIU | Stand-alone | 090-45021-10 | Wire-wrap (Note 1) | 100 ¾ (balanced) | I/O for 2-way T1 |
| ESCIU | Stand-alone | 090-45021-11 | SMB | 75 ¾ (unbalanced) | I/O for 2-way E1 |
| | | 090-45021-12 | Siemens 1.6/5.6 | 75 ¾ (unbalanced) | I/O for 2-way E1 |
| EA10 EA10M | Stand-alone | 990-45105-06 | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 |
| | | 990-45105-13 | SMB | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-14 | Siemens 1.6/5.6 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-15 | Siemens 1.0/2.3 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45108-01 | Wire-wrap (Note 1) | E1: 120 ¾ Analog: 75 ¾ (balanced) | 10 (11, 12, 13 not used) |
| | 1:1, 1+1 | 990-45105-10 (double-wide) | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 |
| | | 990-45105-11 (double-wide) | Wire-wrap or Siemens 1.6/5.6 | E1: 120 ¾ (balanced) or E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-16 (double-wide) | SMB | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-17 (double-wide) | Siemens 1.6/5.6 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-18 (double-wide) | Siemens 1.0/2.3 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |

TABLE U.
MODULES FOR TIMING OUTPUT CARDS (CONT'D)

| FOR OUTPUT CARD | USE MODULE | | | | |
|---|---|---|---|---|---|
| | PROTECTION TYPE | USE PART NUMBER: | CONNECTOR TYPE | IMPEDANCE | NO. OF OUTPUTS |
| TO-EA5 | Stand-alone | 990-45105-06 | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 |
| | | 990-45105-12 | Wire-wrap and Siemens 1.6/5.6 | E1: 120 ¾ (balanced) and E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 5 Wire-wrap and 5 Siemens 1.6/5.6 |
| | | 990-45105-13 | SMB | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-14 | Siemens 1.6/5.6 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-15 | Siemens 1.0/2.3 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45108-01 | Wire-wrap (Note 1) | E1: 120 ¾ Analog: 75 ¾ (balanced) | 10 (Do not use 11, 12, 13) |
| | 1:1, 1+1 | 990-45105-10 (double-wide) | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 |
| | | 990-45105-11 (double-wide) | Wire-wrap or Siemens 1.6/5.6 | E1: 120 ¾ (balanced) or E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 Wire-wrap or 10 Siemens 1.6/5.6 or combination |
| | | 990-45105-16 (double-wide) | SMB | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-17 (double-wide) | Siemens 1.6/5.6 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-18 (double-wide) | Siemens 1.0/2.3 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |

TABLE U.
MODULES FOR TIMING OUTPUT CARDS (CONT'D)

| FOR OUTPUT CARD | USE MODULE | | | | |
|---|---|---|---|---|---|
| | PROTECTION TYPE | USE PART NUMBER: | CONNECTOR TYPE | IMPEDANCE | NO. OF OUTPUTS |
| TO-EA (Do not mix redundant and 1:N in the same shelf) | Stand-alone, 1:N | 990-45105-12 | Wire-wrap and Siemens 1.6/5.6 | E1: 120 ¾ Analog: 75 ¾ (balanced) and E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 5 Wire-wrap and 5 Siemens 1.6/5.6 |
| | | 990-45105-13 | SMB | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-14 | Siemens 1.6/5.6 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-15 | Siemens 1.0/2.3 | E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45108-01 | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 (Do not use 11, 12, 13) |
| | 1+1 | 990-45105-10 (double-wide) | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 |
| | | 990-45105-11 (double-wide) | Wire-wrap or Siemens 1.6/5.6 | E1: 120 ¾ (balanced) or E1: 75 ¾ Analog: 75 ¾ (unbalanced) | 10 Wire-wrap or 10 Siemens 1.6/5.6 or combination |
| TOEA | Stand-alone, 1:N | 990-45105-12 | Wire-wrap and Siemens 1.6/5.6 | E1: 120 ¾ (balanced) or E1: 75 ¾ (unbalanced) | 5 Wire-wrap and 5 Siemens 1.6/5.6 |
| | | 990-45105-13 | SMB | E1: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-14 | Siemens 1.6/5.6 | E1: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-15 | Siemens 1.0/2.3 | E1: 75 ¾ (unbalanced) | 10 |
| | | 990-45108-01 | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | 10 (Do not use 11, 12, 13) |

TABLE U.
MODULES FOR TIMING OUTPUT CARDS (CONT'D)

| FOR OUTPUT CARD | USE MODULE | | | | |
|---|---|---|---|---|---|
| | PROTECTION TYPE | USE PART NUMBER: | CONNECTOR TYPE | IMPEDANCE | NO. OF OUTPUTS |
| TOGA (Do not mix 1+1 and 1:N in the same shelf) | 1:N, 1+1, Stand-alone | 990-45105-12 | Wire-wrap and Siemens 1.6/5.6 | Analog: 75 ¾ (unbalanced) | 5 Wire-wrap and 5 Siemens 1.6/5.6 |
| | | 990-45105-13 | SMB | Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-14 | Siemens 1.6/5.6 | Analog: 75 ¾ (unbalanced) | 10 |
| | | 990-45105-15 | Siemens 1.0/2.3 | Analog: 75 ¾ (unbalanced) | 10 |
| | 1+1 | 990-45105-16 (double-wide) | SMB | Analog: 75 ¾ (unbalanced) | 10 |
| TOCA | 1:N, Stand-alone | 990-45108-01 | Wire-wrap (Note 1) | CC: 133 ¾ (balanced) | 10 (Do not use 11, 12, 13) |
| TOTA TOTL | 1:N, Stand-alone | 990-45105-06 | Wire-wrap (Note 1) | T1: 100 ¾ (balanced) | 10 |
| | | 990-45108-01 | Wire-wrap (Note 1) | T1: 100 ¾ (balanced) | 10 (Do not use 11, 12, 13) |
| TOLA | 1:N, Stand-alone | 990-45108-01 | Wire-wrap (Note 1) | RS-422: 100 ¾ (balanced) RS-423 (TTL): 450 ¾ (unbalanced) | 10 (Do not use 11, 12, 13) |
| TOTA-5 TOTA-M (Do not mix redundant and 1:N in the same shelf) | Stand-alone | 990-45105-06 | Wire-wrap (Note 1) | T1: 100 ¾ (balanced) | 10 |
| | 1:N, Stand-alone | 990-45108-01 | Wire-wrap (Note 1) | T1: 100 ¾ (balanced) | 10 (Do not use 11, 12, 13) |
| TOAA (except 090-40028-10) | 1:N, Stand-alone | 990-45122-01 | BNC | Analog: 75 ¾ (unbalanced) (includes 0 dB, 3.0 dB, 3.5 dB, 30.0 dB, 60.0 dB pads) | 2 |

TABLE U.
MODULES FOR TIMING OUTPUT CARDS (CONT'D)

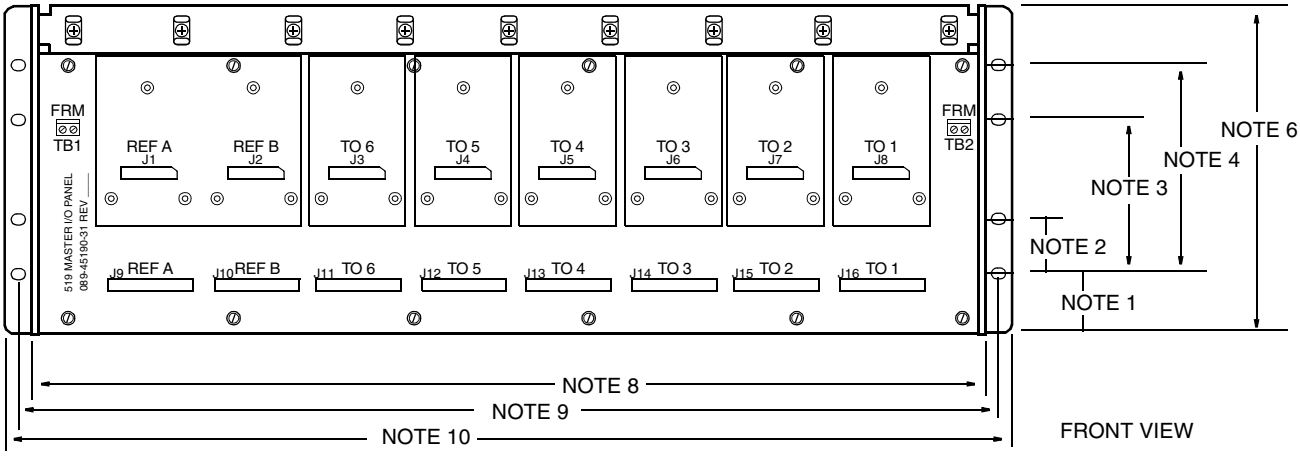
| FOR OUTPUT CARD | USE MODULE | | | | |
|---|---|---|---|---|---|
| | PROTECTION TYPE | USE PART NUMBER: | CONNECTOR TYPE | IMPEDANCE | NO. OF OUTPUTS |
| TOAA (090-40022-02) | 1:N, Stand-alone | 990-45122-01 | BNC | Analog: 50 ¾ (unbalanced) (includes 0 dB, 3.0 dB, 3.5 dB, 30.0 dB, 60.0 dB pads) | 2 |

Notes:
1. Use this module for E1 or T1 signals only.
2. Part numbers shown are for ordering purposes; part numbers on modules start with 089 instead of 990.

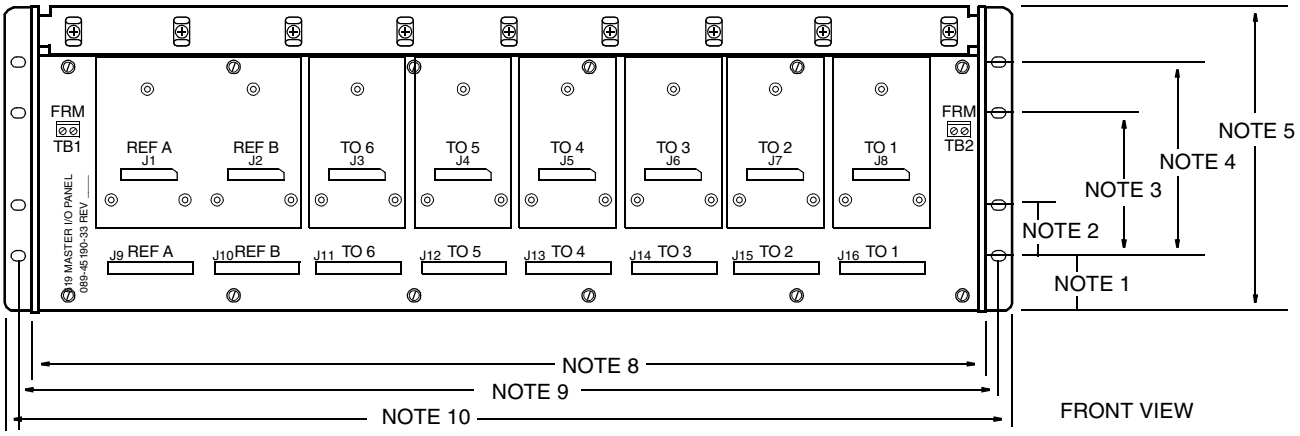
TABLE V.
TIMING OUTPUT MODULES FOR CONNECTORLESS MODULAR MOUNTING PANELS

| FOR OUTPUT CARD | USE MODULE | | | | |
|---|---|---|---|---|---|
| | PROTECTION TYPE | USE PART NUMBER: | CONNECTOR TYPE | IMPEDANCE | NO. OF OUTPUTS |
| TOAA (except 090-40028-10) | 1:N, Stand-alone | 990-40022-10 | BNC | Analog: 75 ¾ (unbalanced) (includes 0, 3.0, 3.5, 30.0, 60.0 dB pads) | 2 |
| TOAA (090-40022-02) | 1:N, Stand-alone | 990-40022-10 | BNC | Analog: 50 ¾ (unbalanced) (includes 0, 3.0, 3.5, 30.0, 60.0 dB pads) | 2 |
| TOCA | 1:N, Sand-alone | 990-40023-10 | DB9 | CC: 133 ¾ (balanced) | 5 |
| | | 990-40011-10 | Wire-wrap (Note 1) | CC: 133 ¾ (balanced) | 10 |
| TOEA TOGA | 1:N, Stand-alone | 990-40022-11 | BNC | E1 or Analog: 75 ¾ (unbalanced) | 10 |
| TOLA | 1:N, Stand-alone | 990-40023-10 | DB9 | TTL: 100 ¾ (balanced) | 5 |
| | | 990-40011-10 | Wire-wrap (Note 1) | RS-422: 100 ¾ (balanced) RS-423 (TTL): 450 ¾ (unbalanced) | 10 |
| TOTA TOTA-5 TOTL TOTA-M | 1:N, Stand-alone | 990-40023-10 | DB9 | T1: 100 ¾ (balanced) | 5 |
| | | 990-40011-10 | Wire-wrap (Note 1) | T1: 100 ¾ (balanced) | 10 |
| SCIU | Stand-alone | 990-40021-10 | Wire-wrap (Note 1) | T1: 100 ¾ (balanced) | I/O for one SCIU card |
| ESCIU | Stand-alone | 990-40021-10 | Wire-wrap (Note 1) | E1: 120 ¾ (balanced) | I/O for one ESCIU card |

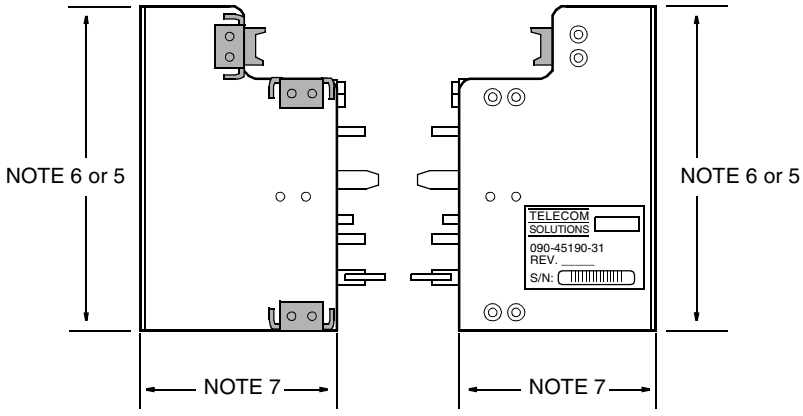
Notes:
1. Use this module for E1 or T1 signals only.
2. Part numbers shown are for ordering purposes; part numbers on modules start with 089 instead of 990.




A. 177 mm (6.97 in) INTERFACE PANEL

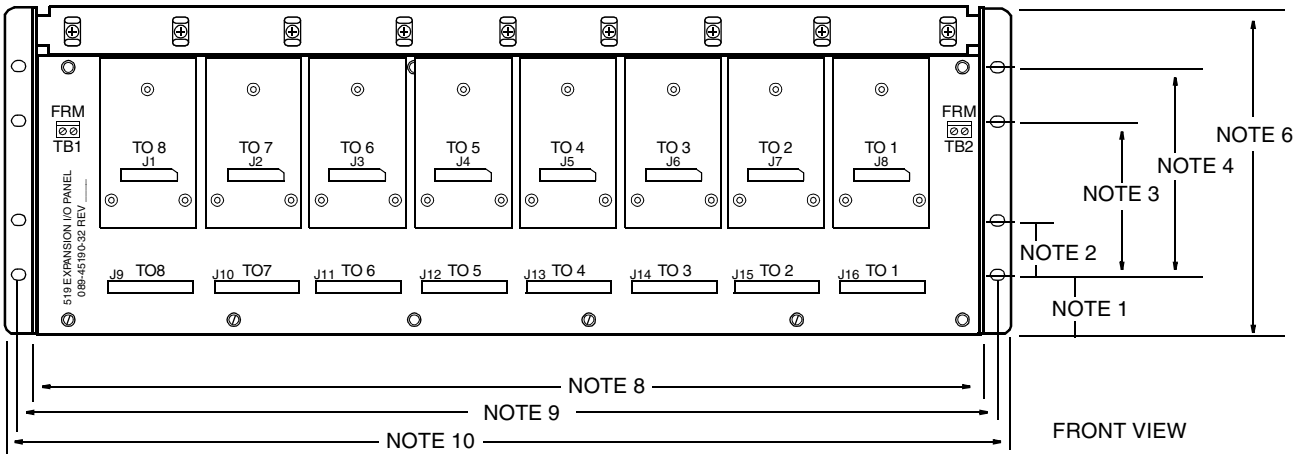



B. 146 mm (5.75 in) INTERFACE PANEL

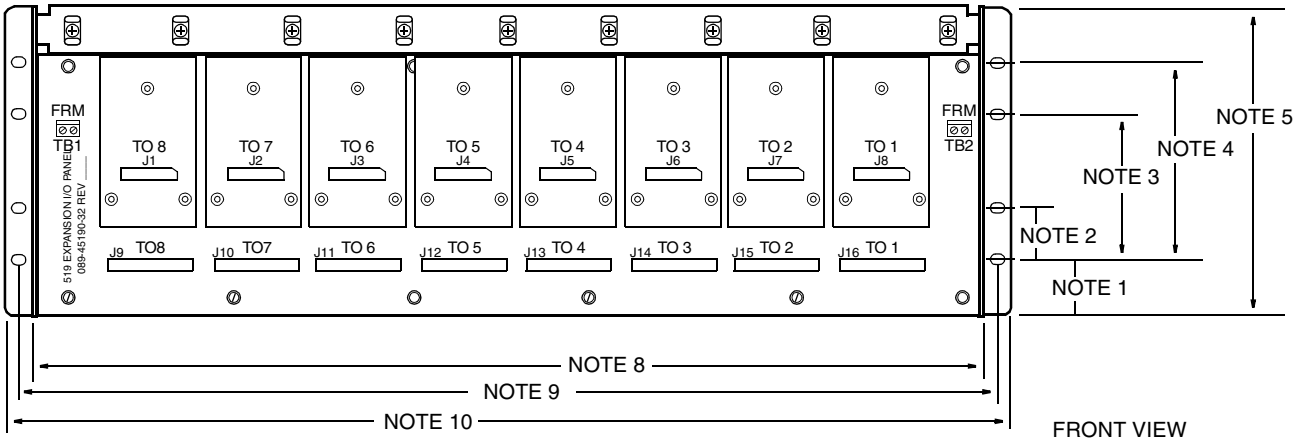



NOTE 1: 25.2 mm (0.992 in)
NOTE 2: 25.4 mm (1.00 in)
NOTE 3: 102 mm (4.02 in)
NOTE 4: 127 mm (5.00 in)
NOTE 5: 146 mm (5.75 in)
NOTE 6: 177 mm (6.97 in)
NOTE 7: 99.6 mm (3.92 in)
NOTE 8: 451 mm (17.8 in)
NOTE 9: 478.5 mm (18.84 in)
NOTE 10: 495.8 mm (19.52 in)

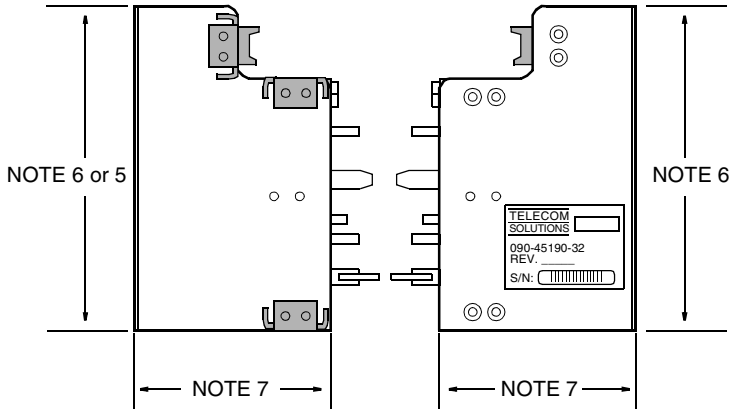
FIGURE 26.
MASTER SHELF INTERFACE PANEL OUTLINE DIMENSIONS




A. 177 mm (6.97 in) INTERFACE PANEL

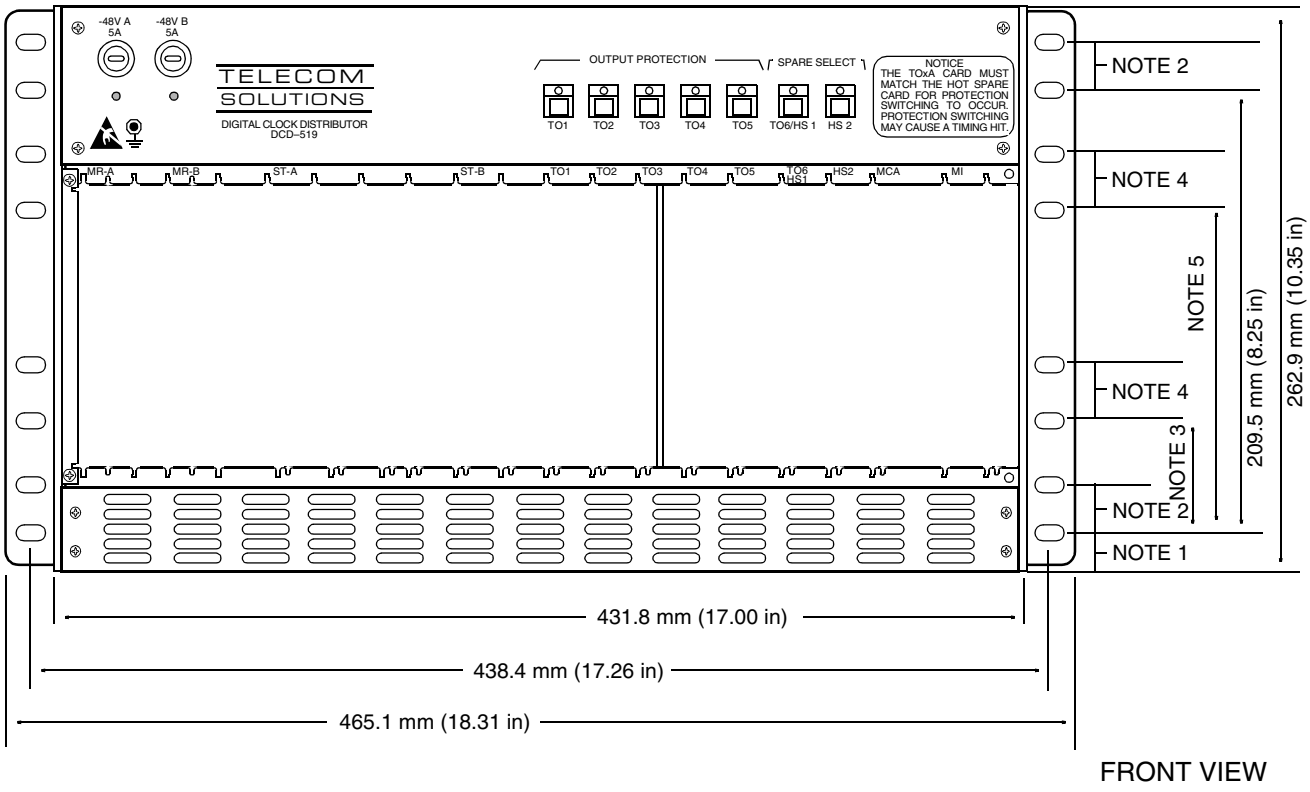



B. 146 mm (5.75 in) INTERFACE PANEL

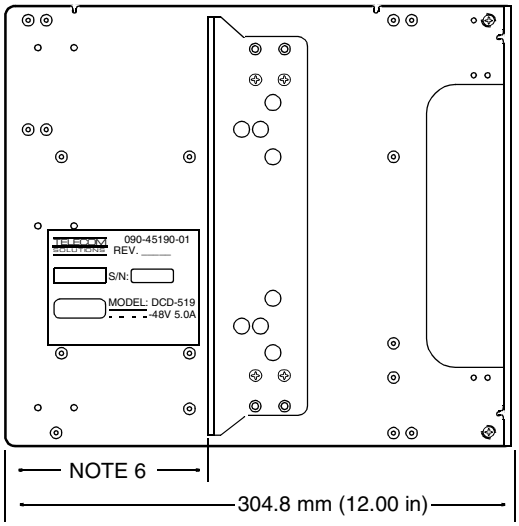



NOTE 1: 25.2 mm (0.992 in)
NOTE 2: 25.4 mm (1.00 in)
NOTE 3: 102 mm (4.02 in)
NOTE 4: 127 mm (5.00 in)
NOTE 5: 146 mm (5.75 in)
NOTE 6: 177 mm (6.97 in)
NOTE 7: 99.6 mm (3.92 in)
NOTE 8: 451 mm (17.8 in)
NOTE 9: 478.5 mm (18.84 in)
NOTE 10: 495.8 mm (19.52 in)

FIGURE 27.
EXPANSION SHELF INTERFACE PANEL OUTLINE DIMENSIONS




FRONT VIEW




SIDE VIEW

NOTE 1: 17.3 mm (0.681 in)
NOTE 2: 19.0 mm (0.748 in)
NOTE 3: 50.8 mm (2.00 in)
NOTE 4: 25.4 mm (1.00 in)
NOTE 5: 152.4 mm (6.00 in)
NOTE 6: 127 mm (5.00 in)

FIGURE 28.
DCD-519 MASTER SHELF ASSEMBLY
OUTLINE DIMENSIONS

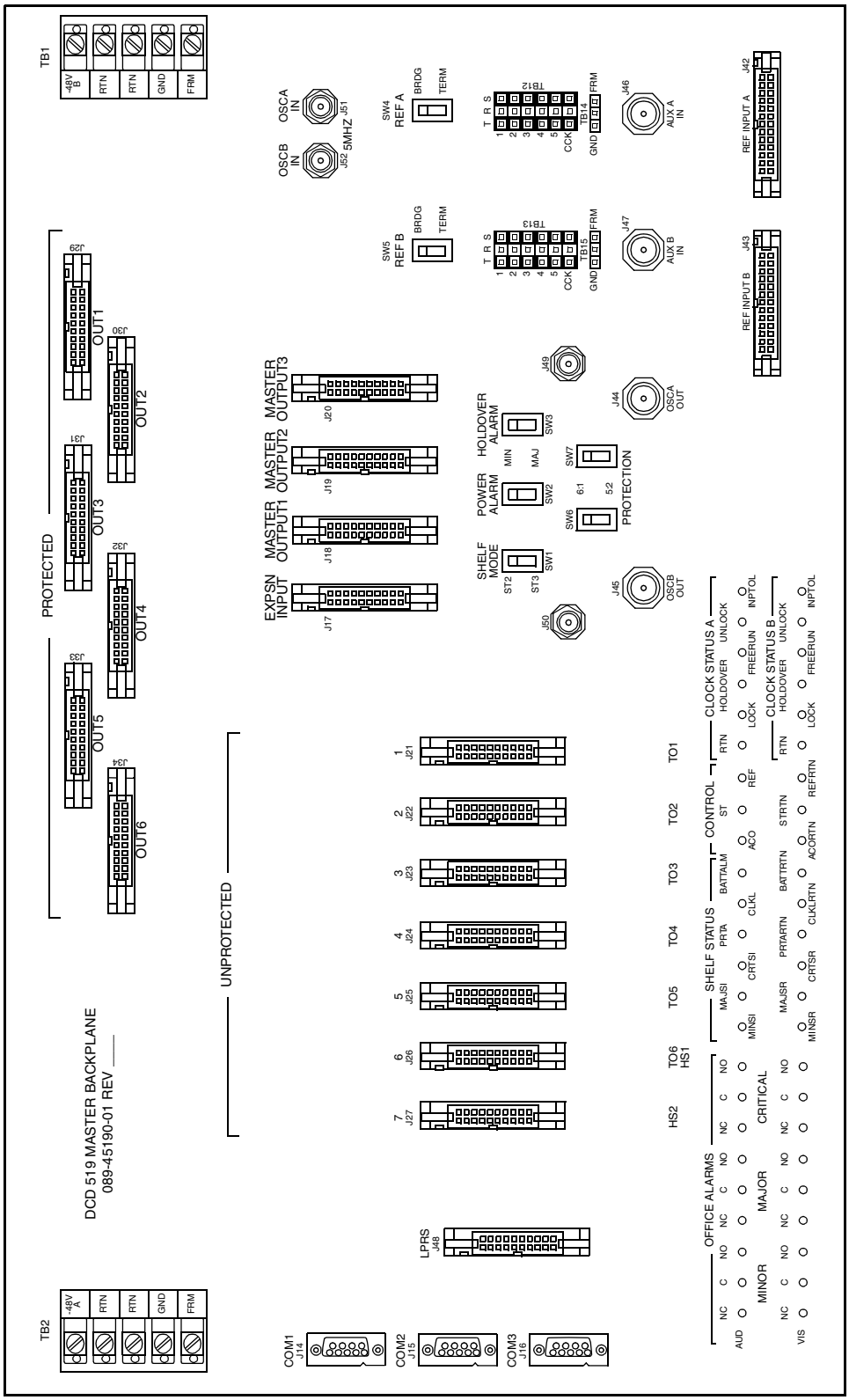
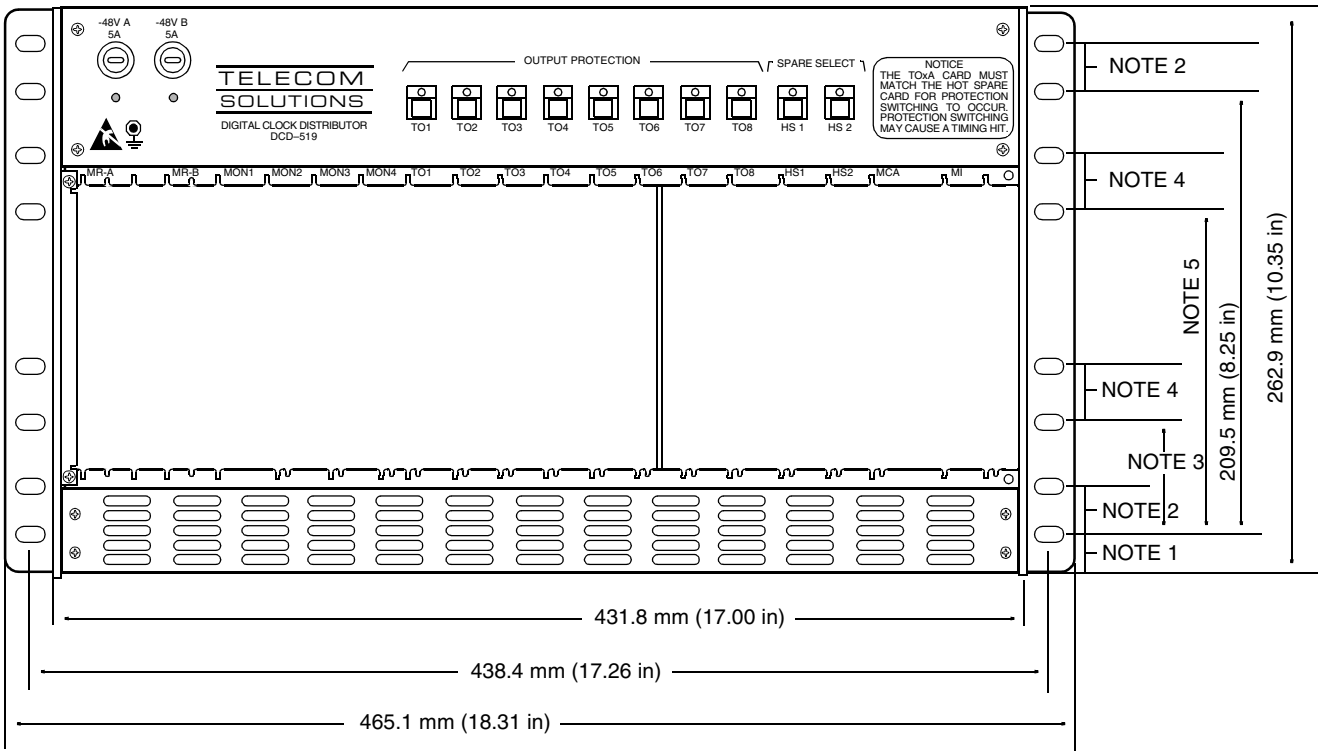
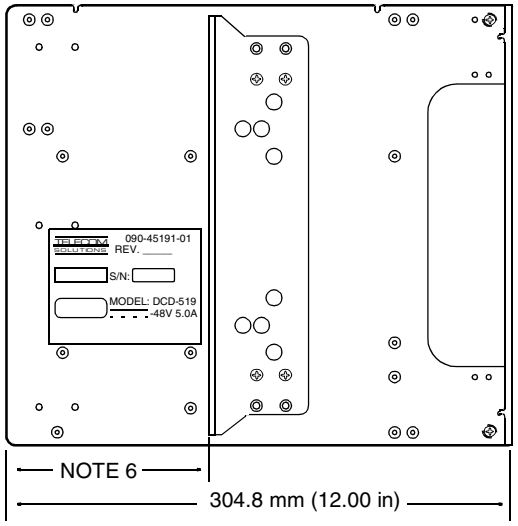



FIGURE 29.
DCD-519 MASTER SHELF BACKPLANE




FRONT VIEW




SIDE VIEW

NOTE 1: 17.2 mm (0.677 in)
NOTE 2: 19.1 mm (0.752 in)
NOTE 3: 50.8 mm (2.00 in)
NOTE 4: 25.4 mm (1.00 in)
NOTE 5: 152.4 mm (6.00 in)
NOTE 6: 127 mm (5.00 in)

FIGURE 30.
DCD-519 EXPANSION SHELF ASSEMBLY
OUTLINE DIMENSIONS

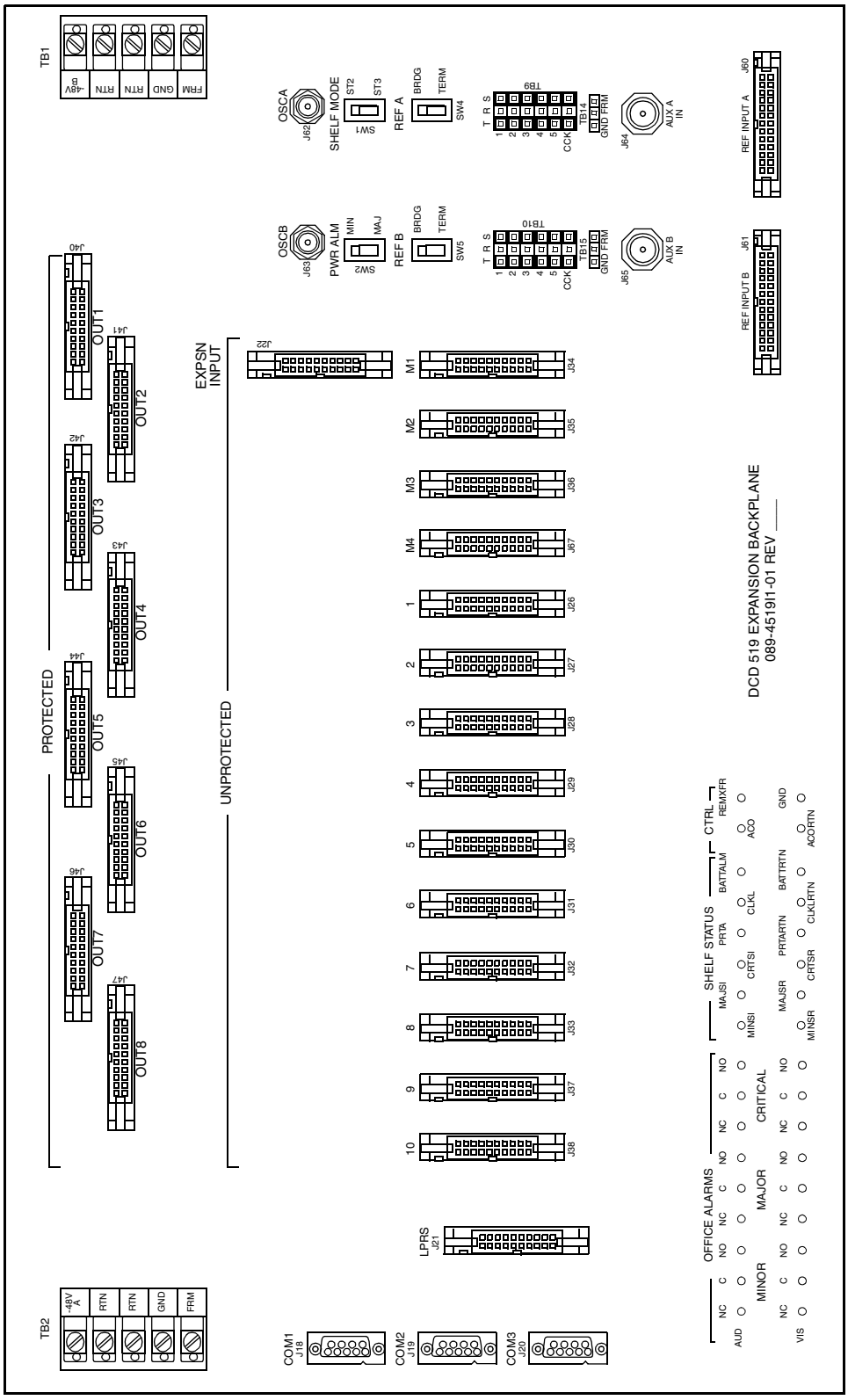



FIGURE 31.
DCD-519 EXPANSION SHELF BACKPLANE

Rear Mounting with Interface Panel (Master and Expansion)

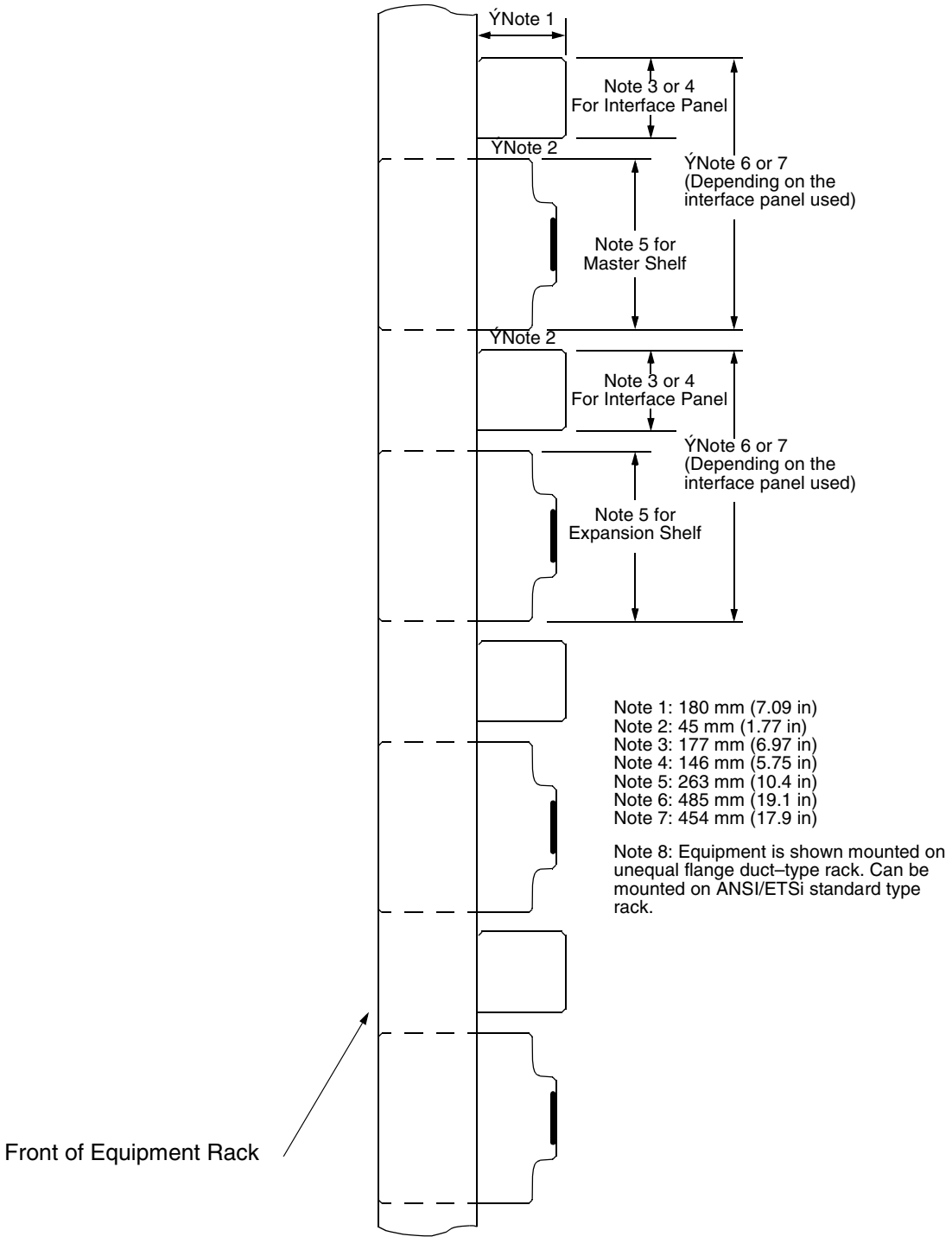



FIGURE 32.
RECOMMENDED RACK MOUNTING CONFIGURATION

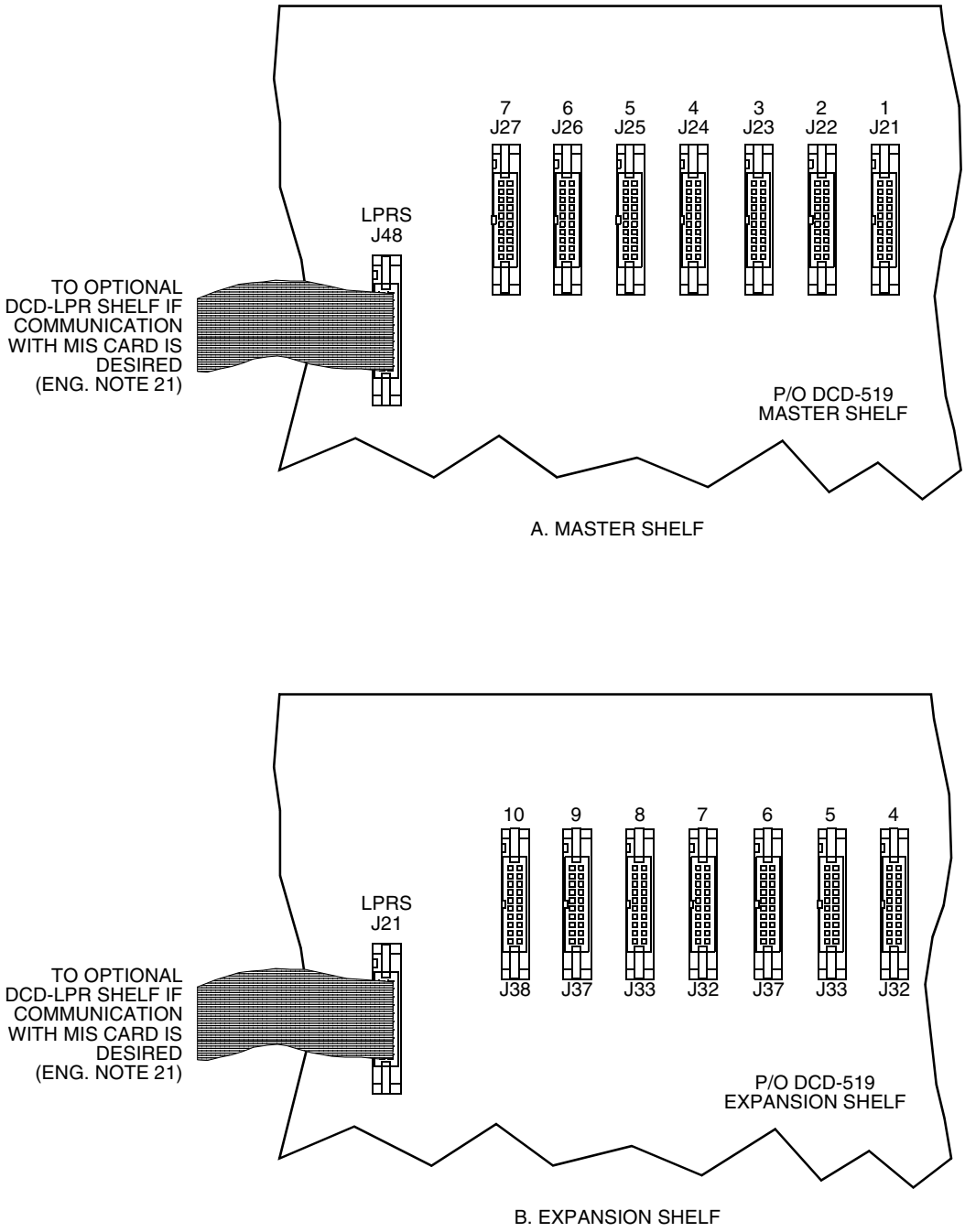
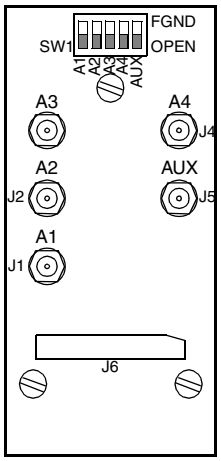
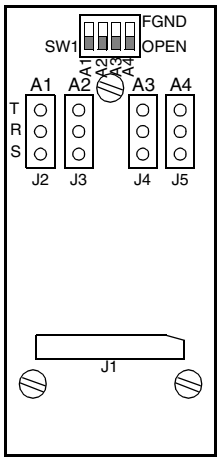



FIGURE 33.
MIS COMMUNICATION TO DCD-LPR CONNECTION
(ENG. NOTE 21)



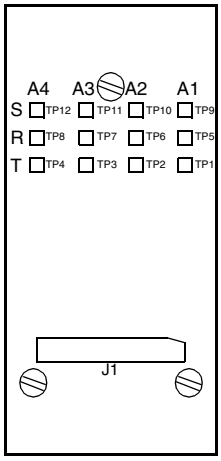

SAMPLE COAXIAL REFRENCE INPUT MODULE



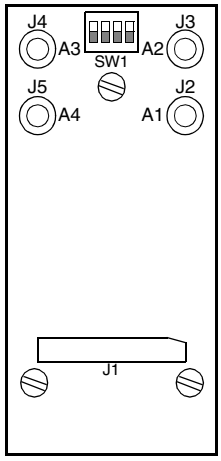

SAMPLE WIRE-WRAP REFRENCE INPUT MODULE

Note: Part numbers for reference input modules are 990-45104-05, -08, -09, -11, -12, 990-45107-02, -03, -04, -06.

FIGURE 34.
REFERENCE INPUT MODULES FOR THE INTERFACE MMP
(ENG. NOTE 13)
(Manufacturing Discontinued)



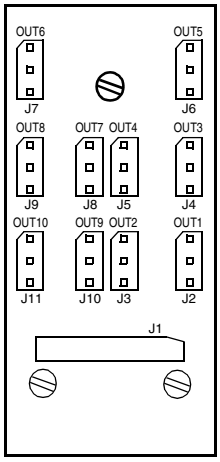

SAMPLE WIRE-WRAP PSM CARD INPUT MODULE



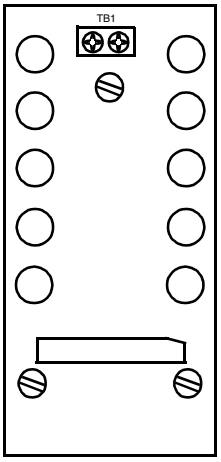

SAMPLE COAXIAL PSM CARD INPUT MODULE

Note: Part numbers for PSM input modules are 990-45106-01, -02, -03, -04, -11, -12, -13, -14, -15.

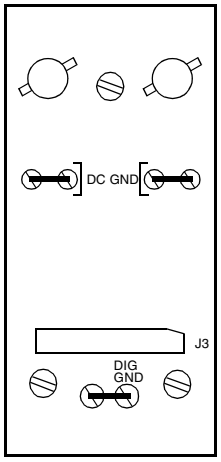
FIGURE 35.
PSM CARD INPUT MODULES FOR THE INTERFACE AND OUTPUT MMPS
(ENG. NOTES 13 AND 18)
(Manufacturing Discontinued)



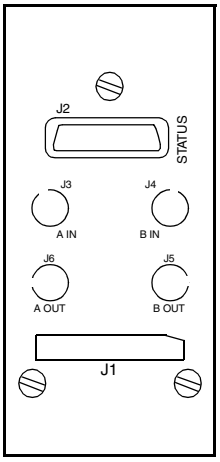

SAMPLE 10-PORT WIRE-WRAP OUTPUT MODULE



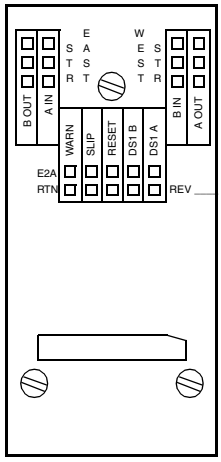

SAMPLE 10-PORT COAXIAL OUTPUT MODULE




2-PORT BNC OUTPUT MODULE



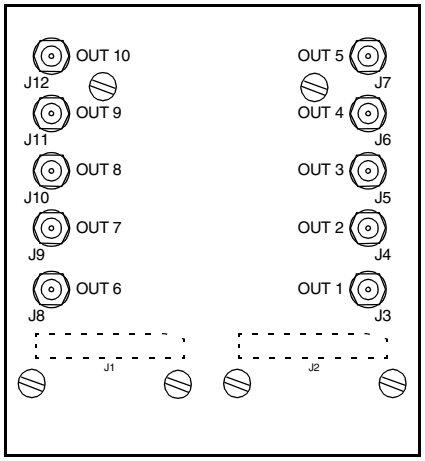

ESCIU OUTPUT MODULE



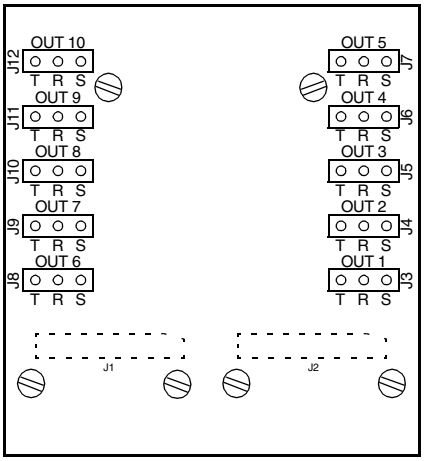

SCIU OUTPUT MODULE

Note: Part numbers for single wide output modules are 990-40021-10, 990-45021-10, -11, 990-45105-02, -03, -04, -06, -12, -13, -14, -15, 990-45122-01.

FIGURE 36.
OUTPUT MODULES FOR THE INTERFACE AND OUTPUT MMPS
(ENG. NOTE 13)
(Manufacturing Discontinued – See FIGURES 44 through 53)



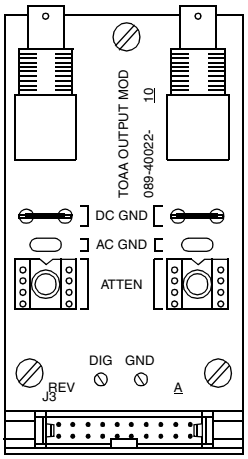

SAMPLE COAXIAL
OUTPUT MODULE



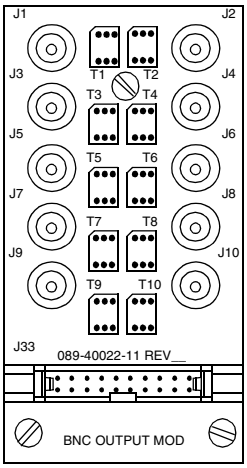

SAMPLE WIRE-WRAP
OUTPUT MODULE

Note: Part numbers for double wide output modules are 990-45107-07, -08, -09, -10, -11, -16, -17, -18.

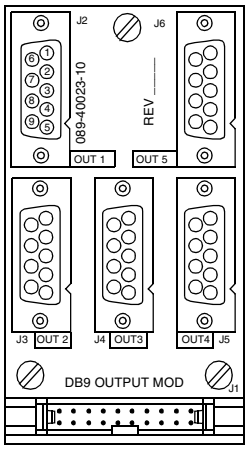
FIGURE 37.
DOUBLE-WIDE OUTPUT MODULES FOR THE INTERFACE AND OUTPUT MMPS
(ENG. NOTE 13)
(Manufacturing Discontinued – See FIGURES 44 through 53)



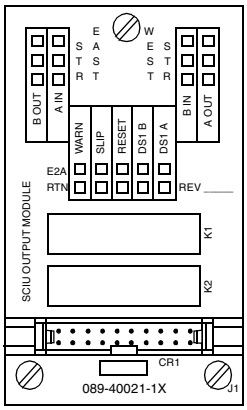

2-PORT BNC OUTPUT MODULE



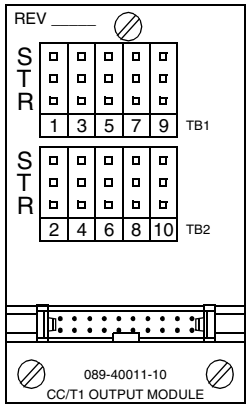

10-PORT BNC OUTPUT MODULE




DB9 OUTPUT MODULE




SCIU WIRE-WRAP OUTPUT MODULE




WIRE-WRAP OUTPUT MODULE

Note: Part numbers for connectorless MMP output modules are 990-40011-10, 990-40021-10, 990-40022-10, -11, 990-40023-10.

FIGURE 38.
OUTPUT MODULES FOR THE CONNECTORLESS MMP
(ENG. NOTE 13)

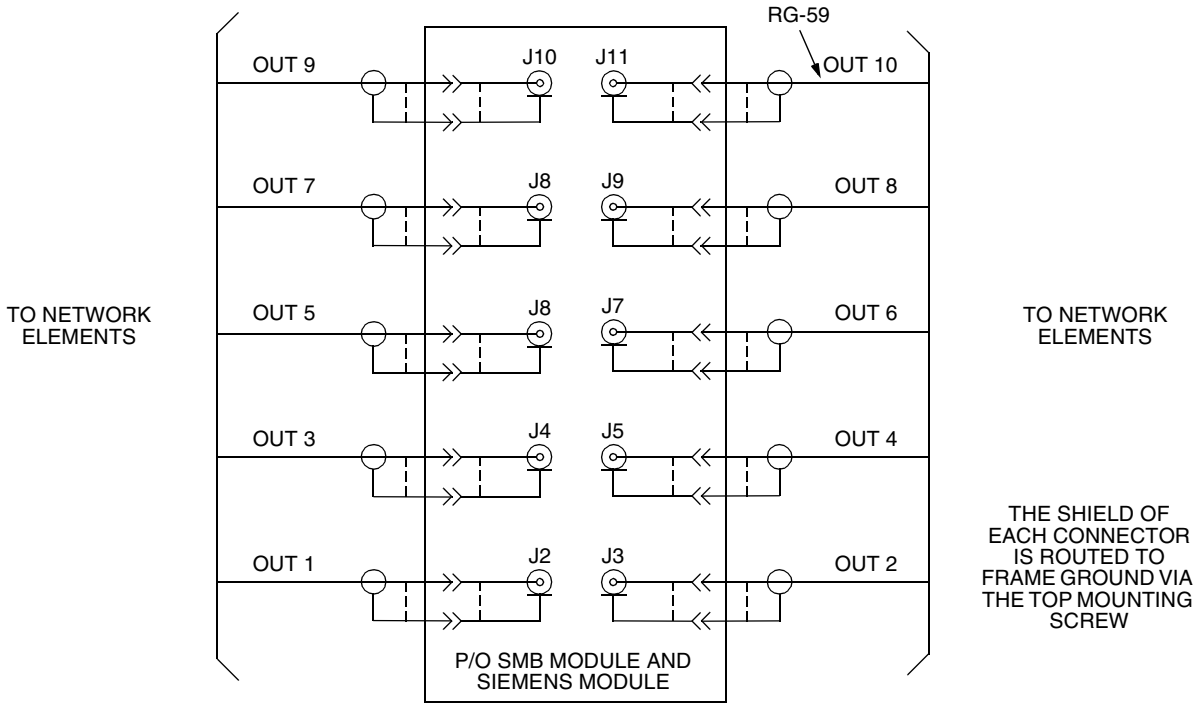
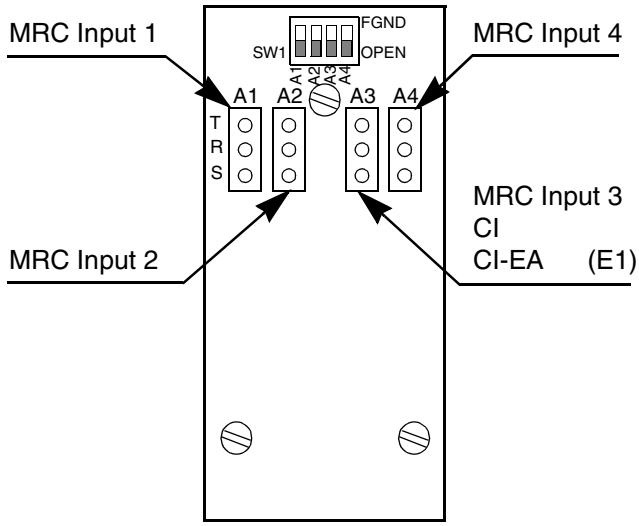
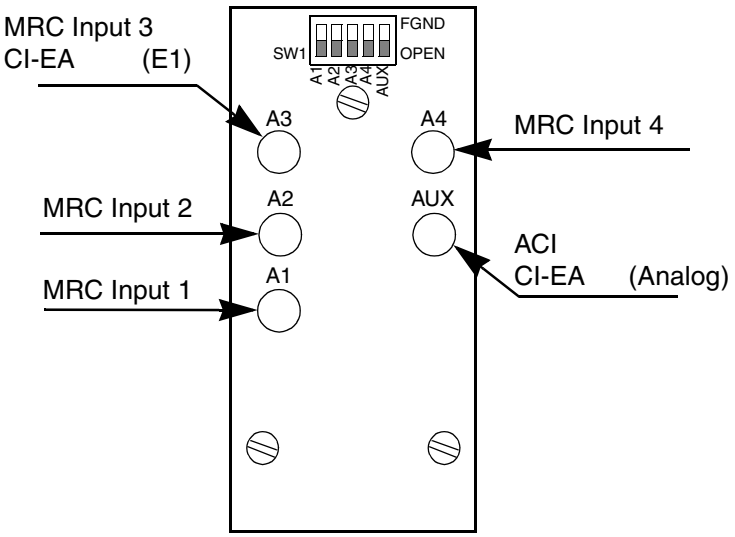



FIGURE 39.
TIMING OUTPUT INTERCONNECTIONS - SMB AND SIEMENS OUTPUT MODULES
(ENG. NOTE 13)




990-45107-06 Module

Use With
CI
CI-EA
MRC-E
MRC-EA
MRC-EA5

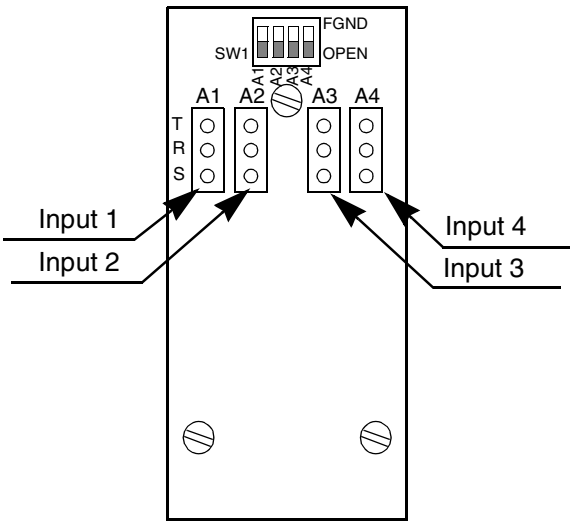



Coaxial Clock Input Module

Module Part Numbers:
990-45107-02 (SMB)
990-45107-03 (Siemens 1.6/5.6)
990-45107-04 (Siemens 1.0/2.3)

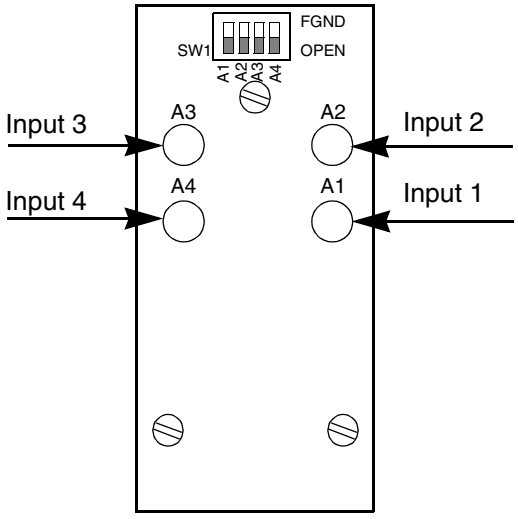
Use With
ACI
CI-EA
MRC-E
MRC-EA
MRC-EA5

FIGURE 40.
REFERENCE INPUT MODULES
(ENG. NOTES 12 AND 20)
(Manufacturing Discontinued – See FIGURE 54)




990-45106-11 PSM Input Module

Use With
PSM-T
PSM-E
PSM-EA

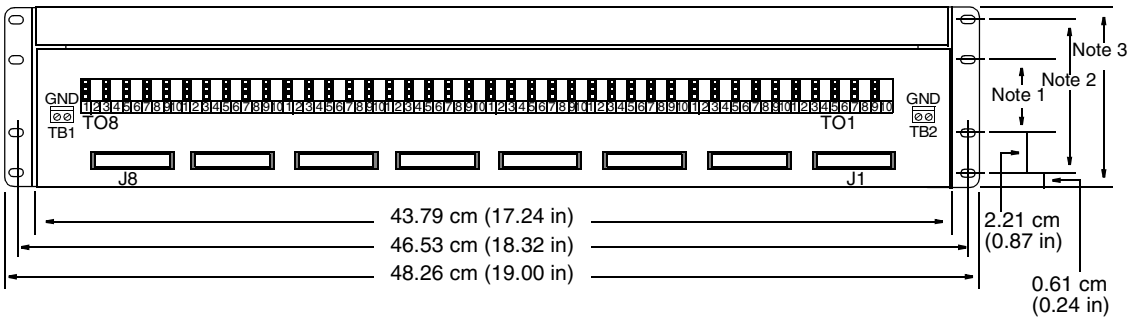



Coaxial PSM Input Module

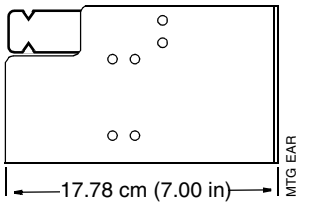
Module Part Numbers:
990-45106-12 (Siemens 1.6/5.6)
990-45106-13 (BNC)
990-45106-14 (SMB)
990-45106-15 (Siemens 1.0/2.3)

Use With
PSM-E
PSM-EA

FIGURE 41.
PSM CARD INPUT MODULES
(ENG. NOTES 12 AND 18)



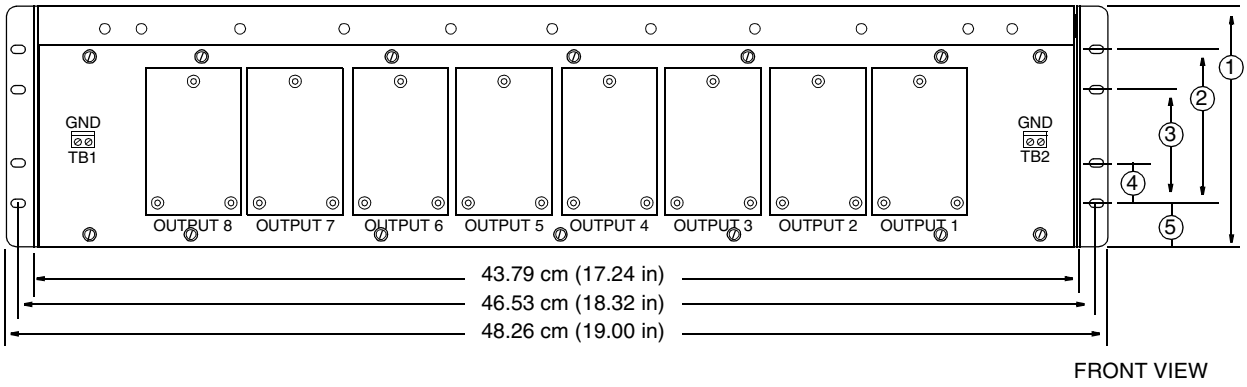

FRONT VIEW

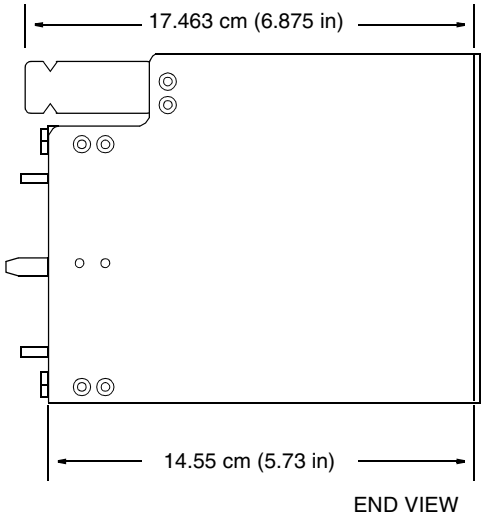



END VIEW

Notes:
1. 3.175 cm (1.25 in)
2. 7.62 cm (3.00 in)
3. 8.81 cm (3.47 in)

FIGURE 42.
WIRE-WRAP PANEL OUTLINE DIMENSIONS




① 13.26 cm (5.22 in)

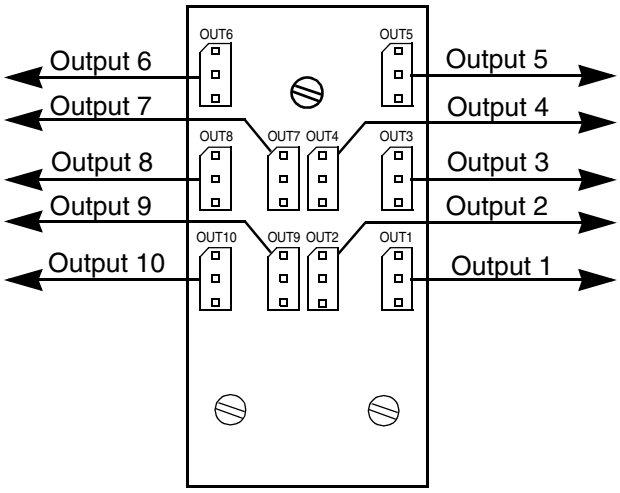
② 7.62 cm (3.00 in)

③ 5.398 cm (2.125 in)

④ 2.223 cm (0.875 in)

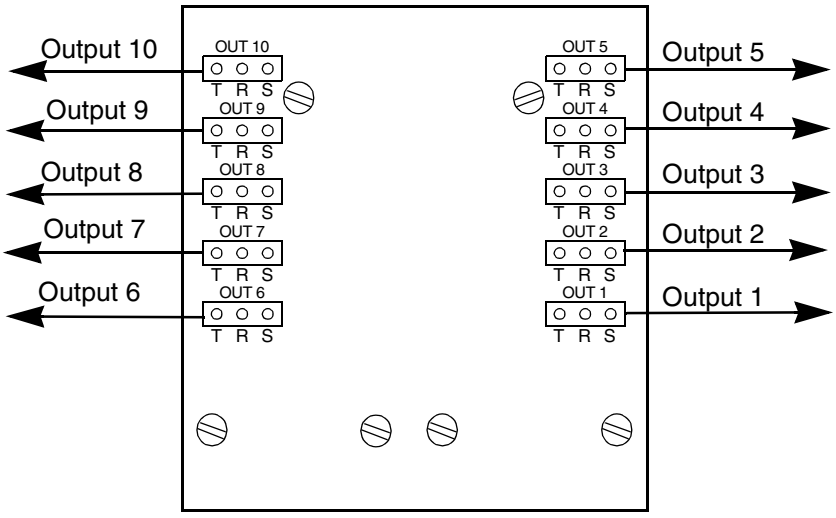
⑤ 2.82 cm (1.11 in)

FIGURE 43.
CONNECTORLESS INTERFACE PANEL OUTLINE DIMENSIONS



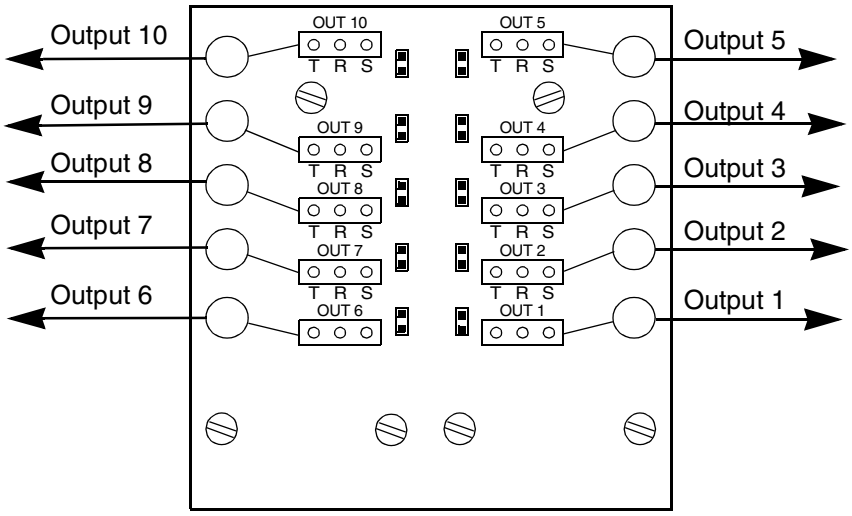

Use With
EA10
TOCA
TO-EA5
TOTA
TOTA-5
TOTL

FIGURE 44.
990-45105-06 MODULE
(ENG. NOTES 12 AND 13)
(Manufacturing Discontinued – See FIGURE 55)




Use With
EA10
TO-EA5
TO-EA
(for redundant pairs)

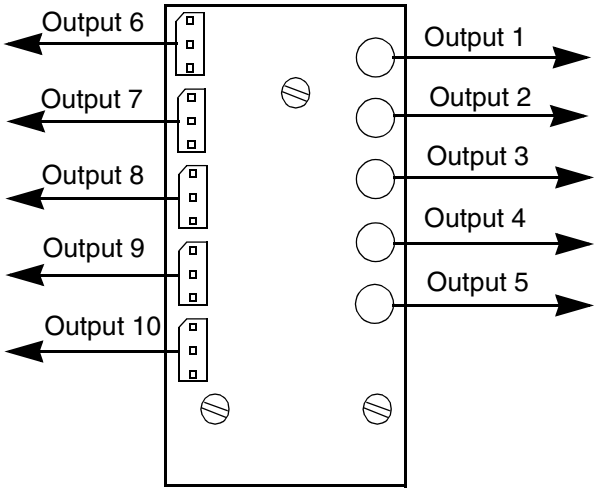
FIGURE 45.
990-45105-10 MODULE
(ENG. NOTES 12 AND 13)
(Manufacturing Discontinued – See FIGURE 56)




Note: Each output may be wire-wrap (jumper on) or Siemens 1.6/5.6 (jumper off).

Use With
EA10
TO-EA5
TO-EA
(for redundant pairs)

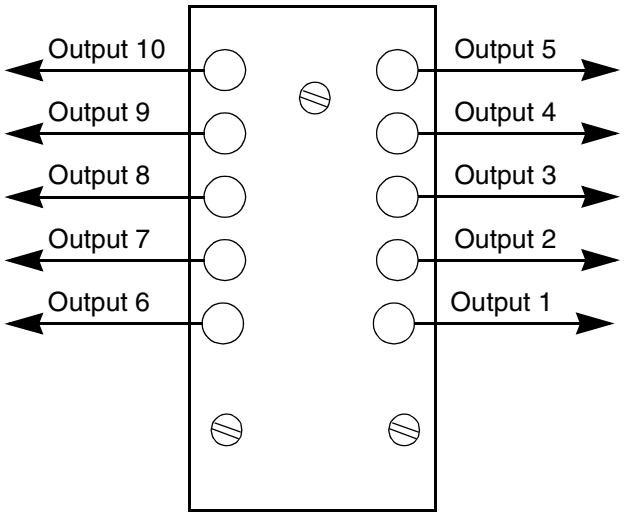
FIGURE 46.
990-45105-11 MODULE
(ENG. NOTES 12 AND 13)
(Manufacturing Discontinued – See FIGURE 57)




Note: Outputs 1 through 5 are Siemens 1.6/5.6, outputs 6 through 10 are wire-wrap.

Use With
TO-EA5
TO-EA
TOEA
TOGA

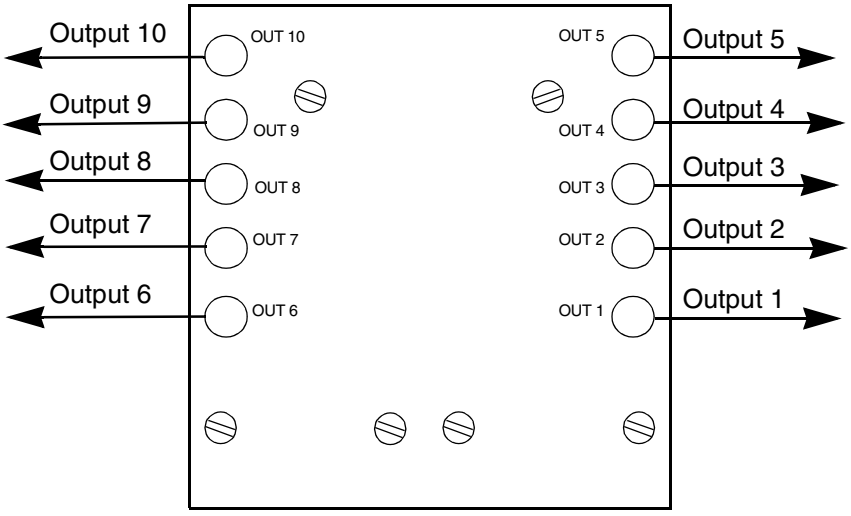
FIGURE 47.
990-45105-12 MODULE
(ENG. NOTES 12 AND 13)




Module Part Numbers:
990-45105-13 (SMB)
990-45105-14 (Siemens 1.6/5.6)
990-45105-15 (Siemens 1.0/2.3)

Use With
EA10
TO-EA5
TO-EA
TOEA
TOGA

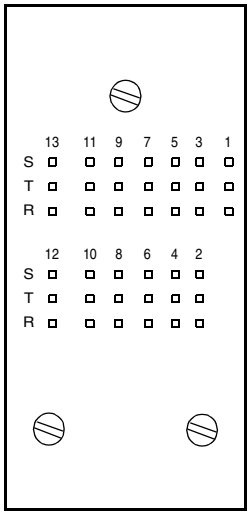
FIGURE 48.
990-45105-13, -14, -15 MODULE
(ENG. NOTES 12 AND 13)
(Manufacturing Discontinued – See FIGURE 58)




Module Part Numbers:
990-45105-16 (SMB)
990-45105-17 (Siemens 1.06/5.6)
990-45105-18 (Siemens 1.0/2.3)

Use With
EA10
TO-EA5
TOGA (990-45105-16)
(for redundant pairs)

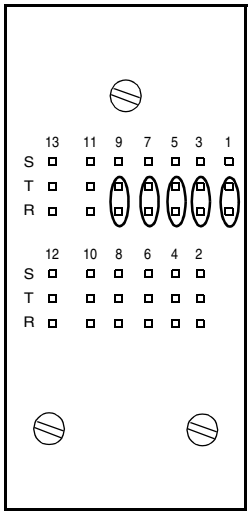
FIGURE 49.
990-45105-16, -17, -18 MODULE
(ENG. NOTES 12 AND 13)
(Manufacturing Discontinued – See FIGURE 59)




Note: The terminal set number is the timing output card port number.

| Use With |
|---|
| EA10 |
| TOCA |
| TO-EA5 |
| TO-EA |
| TOEA |
| TOTA |
| TOTA-5 |
| TOTL |

FIGURE 50.
990-45108-01 MODULE
(ENG. NOTES 12 AND 13)
(Manufacturing Discontinued – See FIGURE 60)



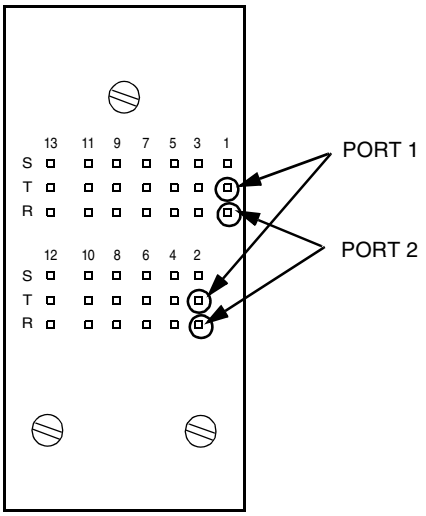

Note: Outputs 1 through 5 are available at the wire wrap terminal sets 1, 3, 5, 7, and 9. The RS-422 (+) driver connects to T and the RS-422 (–) driver connects to R.

| Use With |
|---|
| TOLA (RS-422 signals) |
| TOLA (RS-232 signal, 090-40023-03 card only) |

Note: For a 090-40023-03 (RS-232) card, the T pin is the clock, and the R pin is the ground. Terminal set 10 is a test port.

FIGURE 51.
990-45108-01 MODULE FOR TOLA CARD WITH RS-422 AND RS-232 SIGNALS
(ENG. NOTES 12 AND 13)

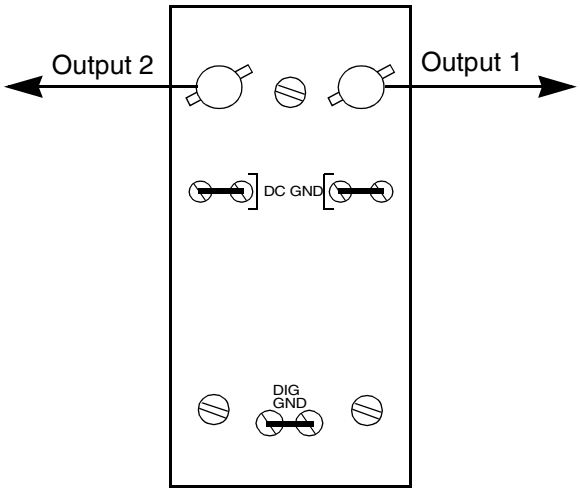
Use With
TOLA (RS-423 signal)




Note: Port 1 and port 2 are identified to show examples of the pin arrangement of the ports. The list on the right identifies the pins associated with the ports.

| Output Port | Signal Lead | | Ground Lead | |
|---|---|---|---|---|
| | Terminal Set | Pin | Terminal Set | Pin |
| 1 | 1 | T | 2 | T |
| 2 | 1 | R | 2 | R |
| 3 | 3 | T | 4 | T |
| 4 | 3 | R | 4 | R |
| 5 | 5 | T | 6 | T |
| 6 | 5 | R | 6 | R |
| 7 | 7 | T | 8 | T |
| 8 | 7 | R | 8 | R |
| 9 | 9 | T | 10 | R |
| 10 | 9 | R | 10 | R |

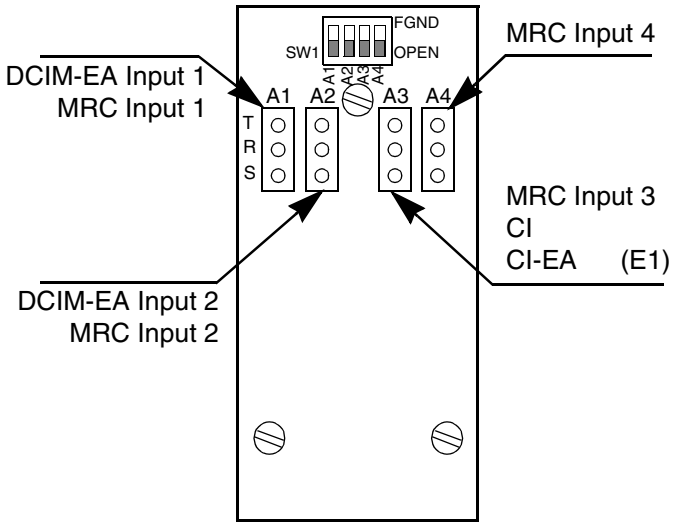
FIGURE 52.
990-45108-01 MODULE FOR TOLA CARD WITH RS-423 SIGNALS
(ENG. NOTES 12 AND 13)




Note: To isolate DC ground (shield) from DCD equipment, remove jumper (DC GND)

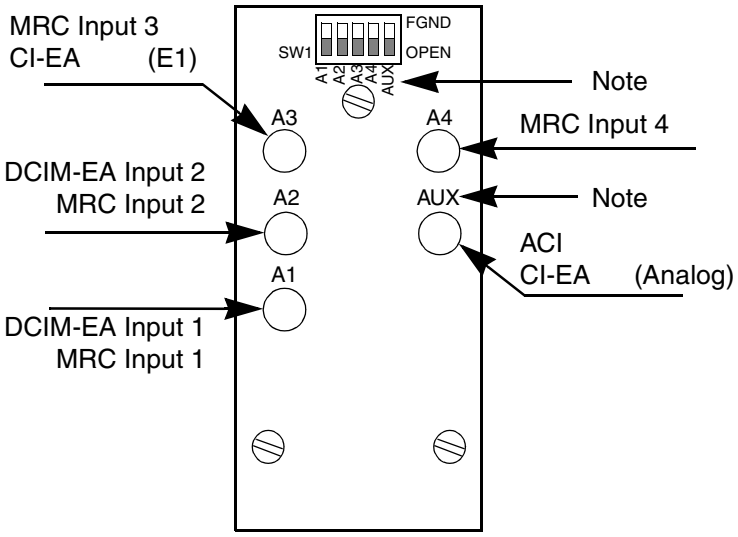
Use With
TOAA

FIGURE 53.
990-45122-01 MODULE
(ENG. NOTES 12 AND 13)




990-45107-06 Module

Use With
CI
CI-EA
MRC-E
MRC-EA
DCIM-EA



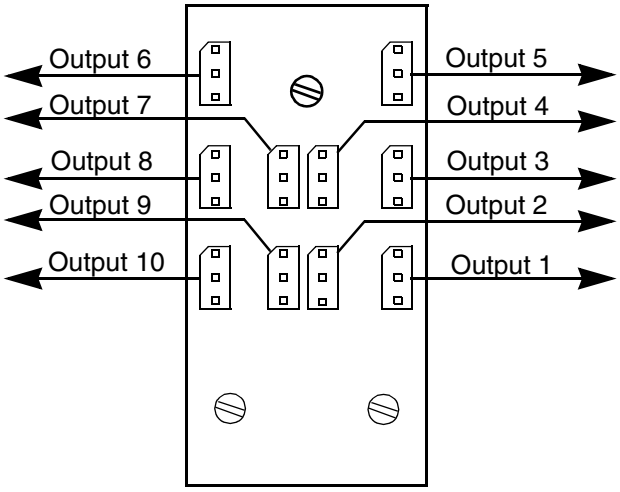

Coaxial Clock Input Module

Module Part Numbers:
990-45107-02 (SMB)
990-45107-03 (Siemens 1.6/5.6)
990-45107-04 (Siemens 1.0/2.3)

Use With
ACI
CI-EA
MRC-E
MRC-EA
MRC-EA5
DCIM-EA

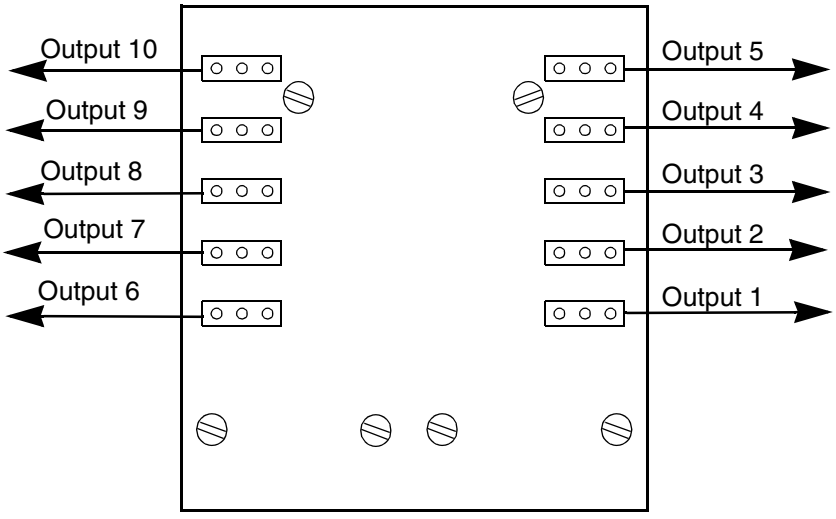
Note: “AUX” is replaced by “A5” on 990-45107-04 modules.

FIGURE 54.
REFERENCE INPUT MODULES
(ENG. NOTES 12 AND 20)



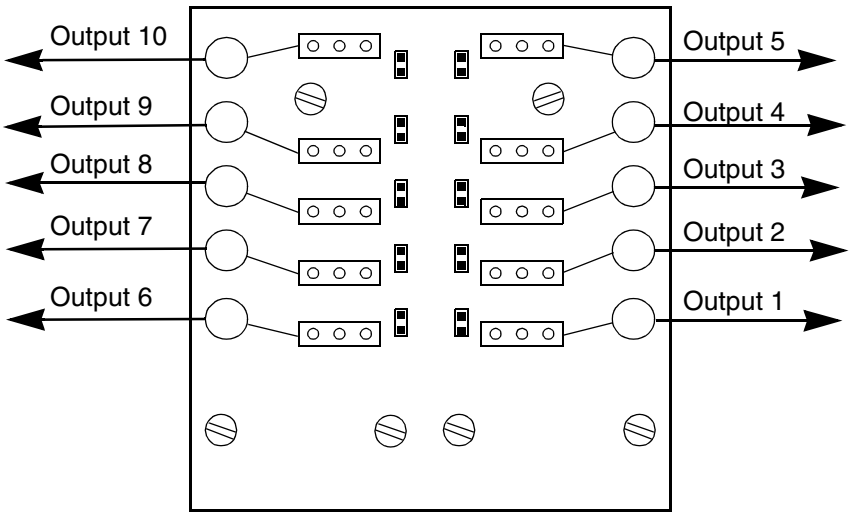

Use With
EA10
EA10M
TO-EA5
TOTA
TOTA-5
TOTA-M
TOTL

FIGURE 55.
990-45105-06 MODULE
(ENG. NOTES 12 AND 13)




Use With
EA10
EA10M
TO-EA5
TO-EA
(for redundant pairs)

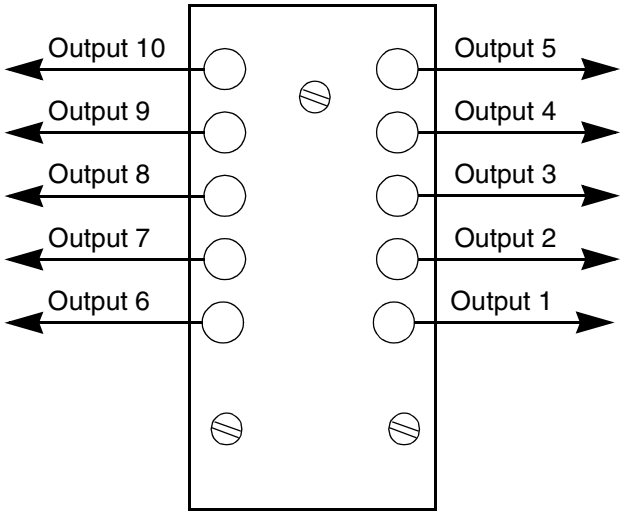
FIGURE 56.
990-45105-10 MODULE
(ENG. NOTES 12 AND 13)




Note: Each output may be wire-wrap (jumper on) or Siemens 1.6/5.6 (jumper off).

Use With
EA10
EA10M
TO-EA5
TO-EA
(for redundant pairs)

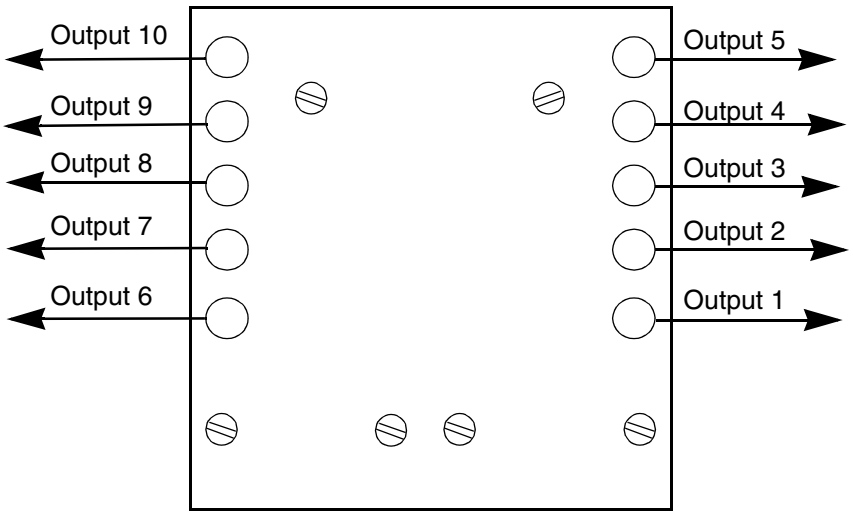
FIGURE 57.
990-45105-11 MODULE
(ENG. NOTES 12 AND 13)




Module Part Numbers:
990-45105-13 (SMB)
990-45105-14 (Siemens 1.6/5.6)
990-45105-15 (Siemens 1.0/2.3)

Use With
EA10
EA10M
TO-EA5
TO-EA
TOEA
TOGA

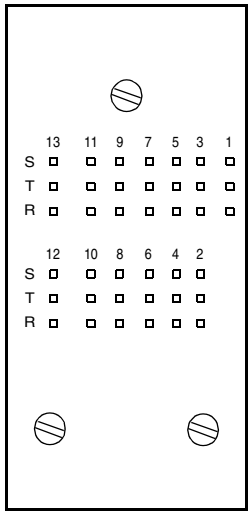
FIGURE 58.
990-45105-13, -14, -15 MODULE
(ENG. NOTES 12 AND 13)




Module Part Numbers:
990-45105-16 (SMB)
990-45105-17 (Siemens 1.06/5.6)
990-45105-18 (Siemens 1.0/2.3)

Use With
EA10
EA10M
TO-EA5
TOGA (990-45105-16)
(for redundant pairs)

FIGURE 59.
990-45105-16, -17, -18 MODULE
(ENG. NOTES 12 AND 13)




Note: The terminal set number is the timing output card port number.

Use With
EA10
EA10M
TOCA
TO-EA5
TO-EA
TOEA
TOTA
TOTA-5
TOTA-M
TOTL

FIGURE 60.
990-45108-01 MODULE
(ENG. NOTES 12 AND 13)