B18-05776-XX
UNIVERSAL ORDER WIRE ASSEMBLY

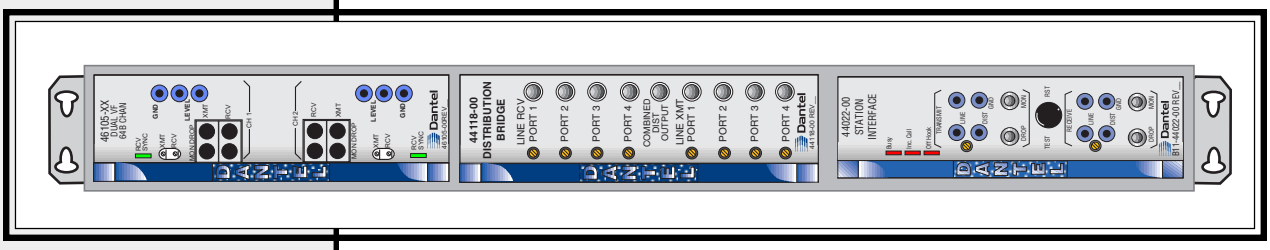


Table of Contents

About this Practice:

This practice has been reissued to:

- Document B18 release with new M Lead Interface Module.
- Update Figs. 2, 3, and 6.

Reissued Practices: Updated and new content can be identified by a banner in the right margin.

UPDATED

Issue date: November 1998

CAUTION

- Install or remove modules from the shelf only when the power is off. If you install a module in the shelf with the power on, the internal circuitry may suffer damage and the product warranty will be void.
- Remove and install circuit boards only in a static-safe environment (use antistatic wrist straps, smocks, footwear, etc.).
- Keep circuit boards in their antistatic bags when they are not in use.
- Do not ship or store circuit boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.
- For more complete information on electrostatic discharge safety precautions, refer to Bellcore™ Technical Reference # TR-NWT-000870.

ORDERING INFORMATION

NOTE: This section lists the different options available for this product. To order any of the available options, contact Dantel Inside Sales through our toll-free number, **1-800-432-6835.**

OPTION NUMBER	FEATURES
B18-05776-00	Wired only. No modules
B18-05776-01	Wired shelf equipped with one 46105 Dual VF 64Kb Channel module; one 44022 Subscriber Line Interface module; and one 44118 4W/4W VF Bridge.
B18-05776-02	Equipped the same as the -01 option above; less the 46105.

UPDATED

GENERAL DESCRIPTION

NOTE:

With the release of the B18-05776-XX Universal Orderwire assembly, the A80-00630-00 M lead interface module has been added.

This assembly will allow for control of M lead devices that require RS-232 or RS-449 RTS leads to enable the 64 kb channels. The interface module can be provisioned so that the on-hook idle condition is normal low or normal high.

NEW NOTE

This shelf is designed to be a 4-wire analog or digital order wire assembly (OW). It is wired for:

- 44022-00 (A17-44022-00) Subscriber Line Interface module
- 44118-00 (A17-44118-00) 4W/4W VF Bridge
- 46105-00 (A17-46105-00) Dual VF 64 Kb Channel module.

The 05776 is equipped to use a 4-wire telephone such as the A23-00010-20 or an A18-05775-00 3 channel OW speaker monitor panel. No DTMF decoding is provided for this unit. DTMF signaling is only used to get access to the VNET interface to the PBX.

The unit is designed as a party-line system so that a caller, on the OW channel, will simply speak into the handset and call who he wants to talk to. The same is true from a call coming in from the Off-Net package. The Off-Net unit associated with this system will be the VNET PBX assembly A18-05774.

The 05776 operates from -21 to -56 volts with levels of +7 to -16 dBm on any port of the 44118 VF bridge. In this application all ports of the bridge will be set for -16 dBm on the transmit ports and +7 dBm on the receive ports. The OW interface will be made up of:

- A 46105-00 Dual VF card in slot 1 (J1)
- A 4118-00 4w/4w bridge in slot 2 (J2)
- A 44022-00 subscriber line interface in slot 3 (J3).

INSTALLATION

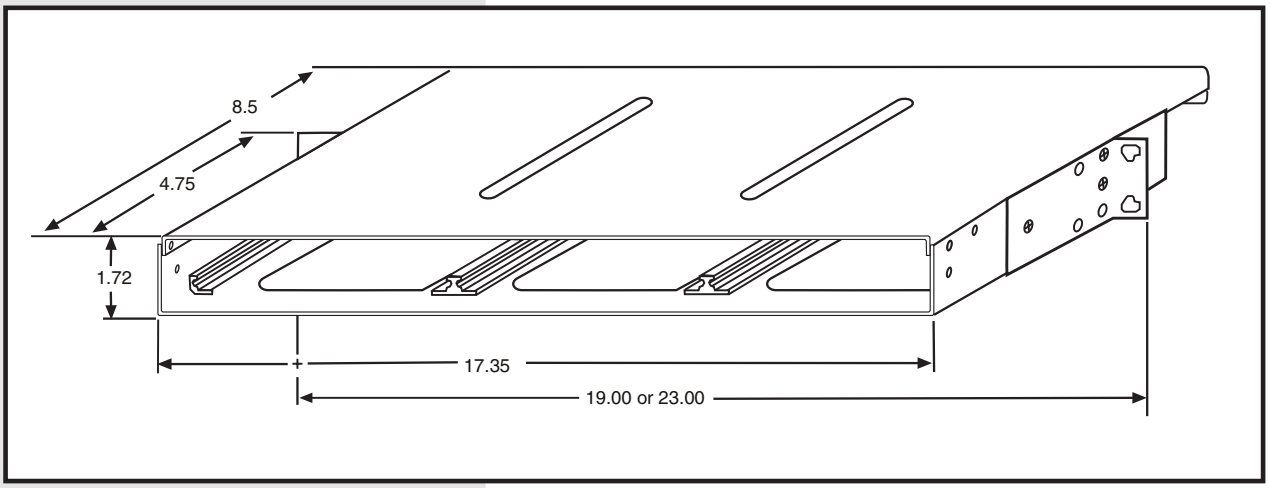
This section consists of:

- Equipment mounting
- Wiring
- Switch and strap settings
  - 44118 Bridge
  - 44022 Subscriber Line Interface
  - 46105 Dual VF 64Kb Channel

EQUIPMENT MOUNTING

Install the shelf in an equipment rack using the hardware provided. Refer to Fig. 1.

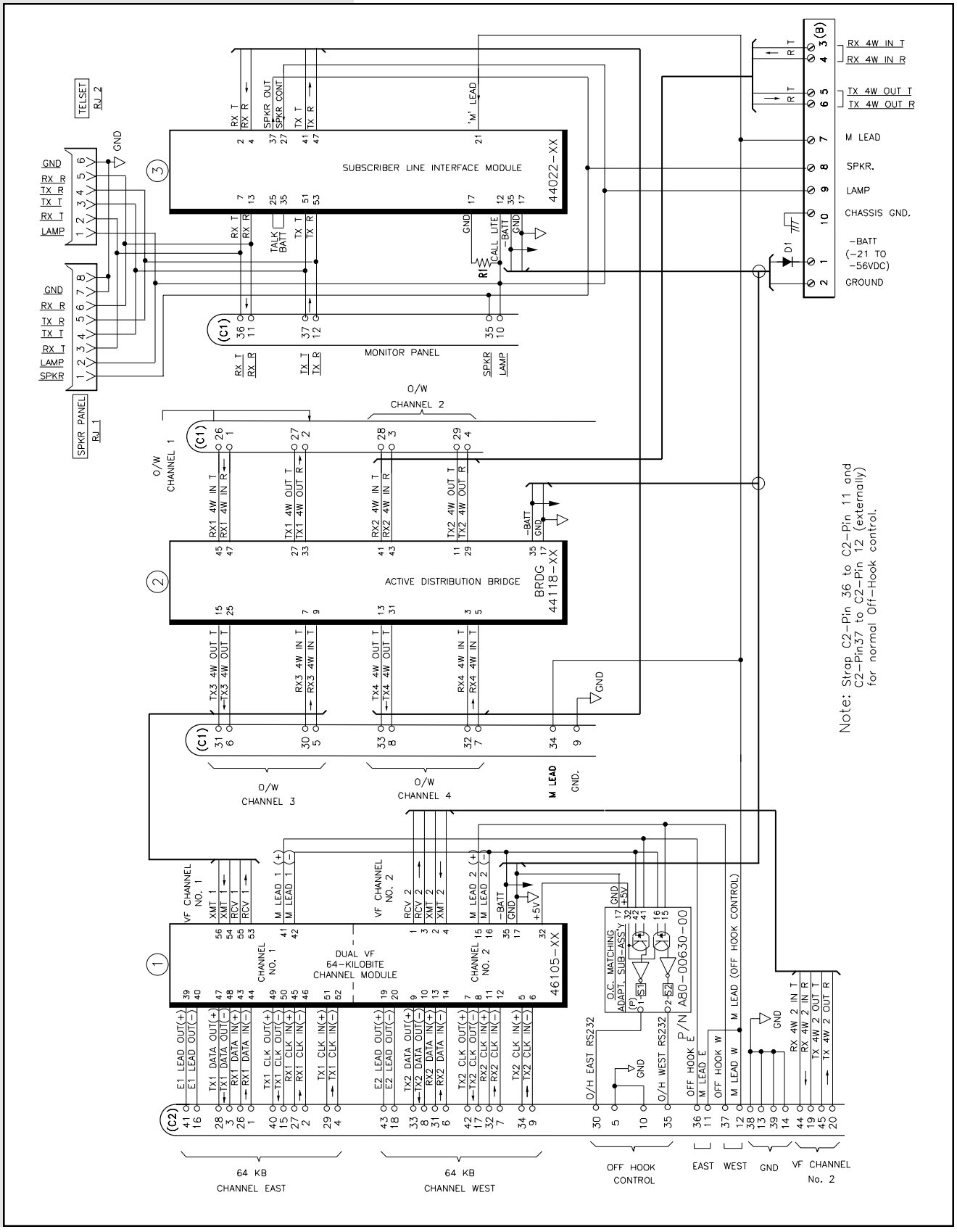
FIG. 1 - MOUNTING DIMENSIONS



WIRING

Wire the shelf as required. Refer to Fig. 2 for a functional schematic of the unit. Fig. 3 shows the connector locations on the rear of the unit.

FIG. 2 - FUNCTIONAL SCHEMATIC, 05776 SHELF

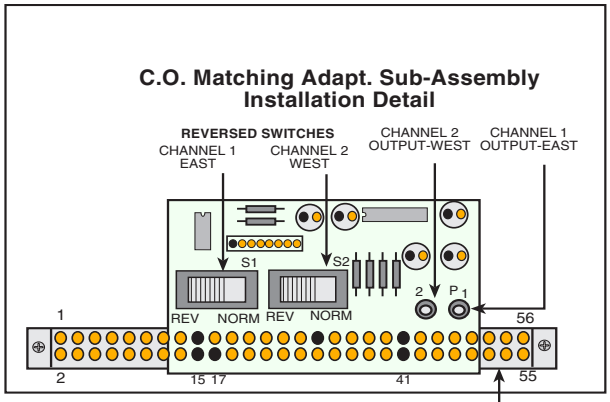


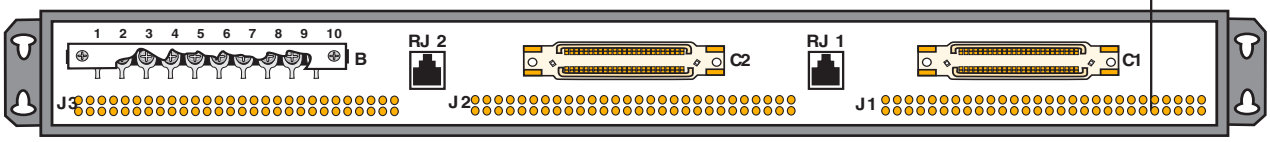
UPDATED

FIG. 3 - REAR VIEW, 05776 SHELF

With the reversing switches in the right, or NORM position (viewed from the back), the associated idle output (on hook) is low and high when the device is off hook. With the switch in the REV position, the idle output is high and low with an off hook.

S1 and S2 are shipped from the factory in the REV position.





SWITCH AND STRAP SETTINGS

NOTE:
All switches, straps, and levels are factory-set.

Refer to Tables A through C and Fig. 4 through 6 to set the straps and switches on the modules.

TABLE A - SWITCH AND STRAP SETTINGS, 44118 BRIDGE

OPTION	STRAP IN
GAIN STRAPS	
Receive Port 1 0 to +7 dB	1R LO
Receive Port 2 0 to +7 dB	2R LO
Receive Port 3 0 to +7 dB	3R LO
Receive Port 4 0 to -16 dB	4R LO
Transmit Port 1 0 to -16 dB	1X LO
Transmit Port 2 0 to -16 dB	2X LO
Transmit Port 3 0 to -16 dB	3X LO
Transmit Port 4 0 to +7 dB	4X LO
FOUR-WAY BRIDGE	
Summing Bus IN	B1X, B2X, B3X, B4X
Transmit Distribution Networks OUT	D1H, D2H, D3H, D4H
Receive Distribution Networks OUT	H1R, H2R, H3R, H4R

FIG. 4 - SWITCH AND STRAP LOCATIONS, 44118 BRIDGE

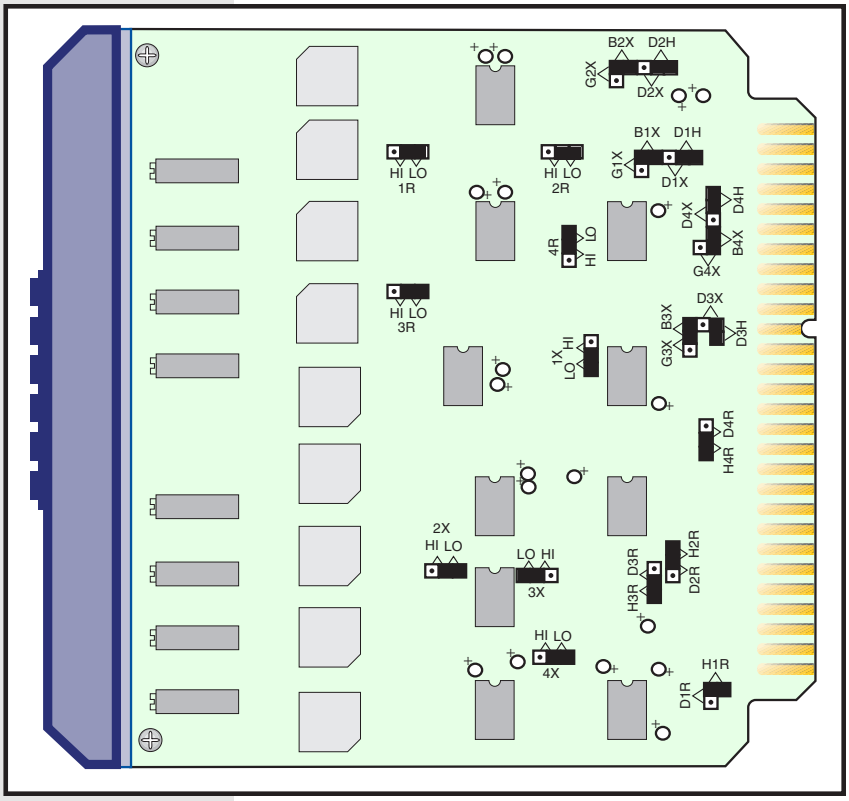


TABLE B - SWITCH AND STRAP SETTINGS, 44022 SUBSCRIBER LINE INTERFACE

STRAP	OPTION
ALL CALL AND GROUP CALL RINGBACK TONE	
Group Call All Call	GP ALL
LINE RECEIVE; 4-WIRE RCV LEVEL	
-16 dBm to -3 dBm	RCV PAD OUT
LINE TRANSMIT; 4-WIRE XMT LEVEL	
-3 dBm to +7 dBm	XMT PAD OUT
REMOTE M LEAD CONTROL	
By incoming call (with radios)	IN
PRIVACY	
No Privacy (normal for order wire applications)	PRIVACY OUT
2-WIRE/4-WIRE (DROP)	
4-Wire	4W (Straps horizontal)
SIDETONE	
4-Wire; with sidetone	SIDETONE IN
4-WIRE DROP RCV IMPEDANCE	
600 ohms	600 OHMS (Straps horizontal)
Ring Generator	OUT (always)

FIG. 5• - STRAP LOCATIONS, 44022 SUBSCRIBER LINE INTERFACE

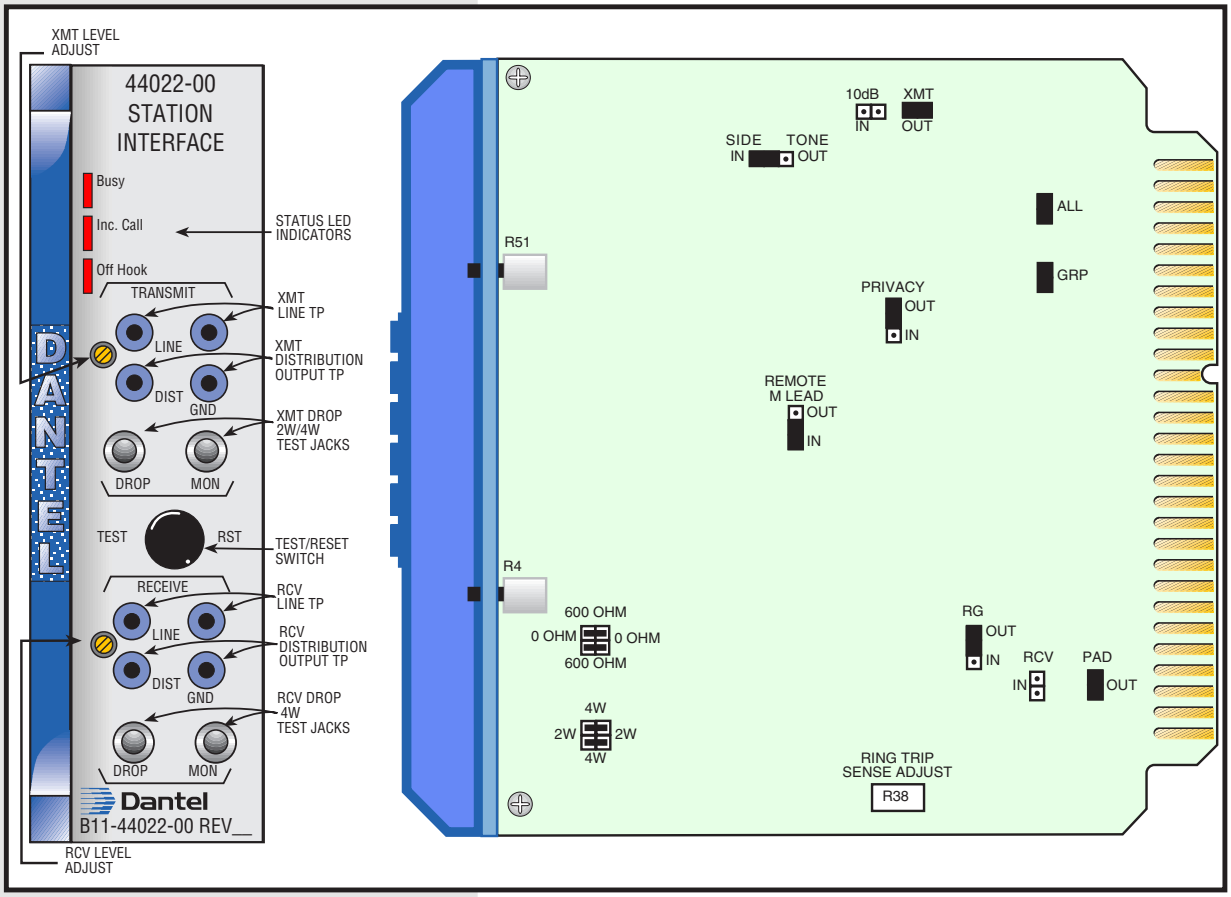
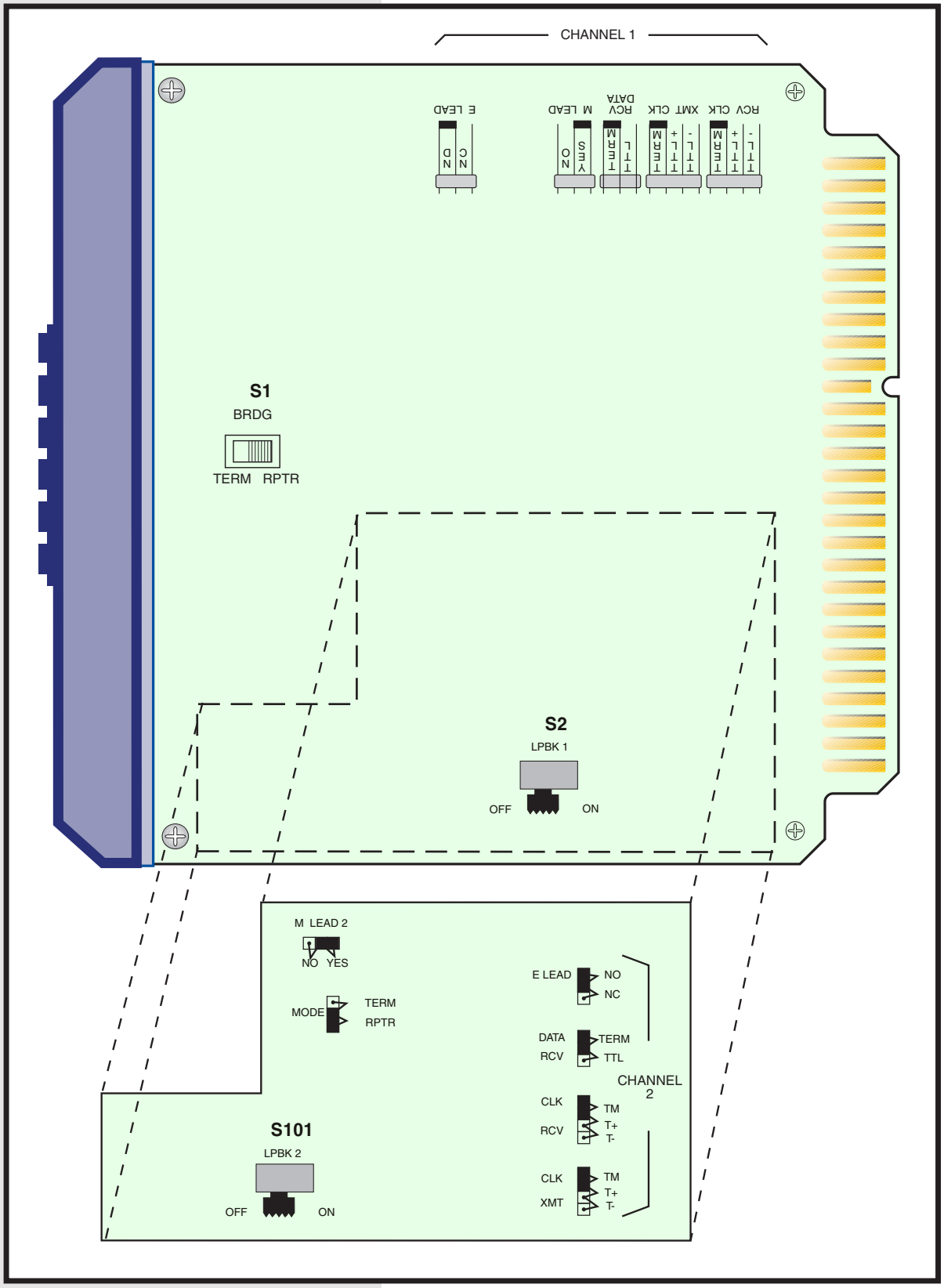


TABLE C - STRAP AND SWITCH SETTINGS, 46105 DUAL VF 64KB CHANNEL

STRAP	POSITION	DESCRIPTION
XMT CLK	TERM	180-ohm termination across RS-422 inputs at pins 51 and 52
RCV CLK 1	TERM	180-ohm termination across RS-422 inputs at pins 45 and 46
RCV DATA 1	TERM	180-ohm termination across RS-422 inputs at pins 43 and 44
XMT CLK 2	TERM	180-ohm termination across RS-422 inputs at pins 5 and 6
RCV CLK 2	TERM	180-ohm termination across RS-422 inputs at pins 11 and 12
RCV DATA 2	TERM	180-ohm termination across RS-422 inputs at pins 13 and 14
E LEAD 1	NO	Relay at pins 39 and 40 is normally open when E Lead 1 is active
E LEAD 2	NO	Relay at pins 19 and 20 is normally open when E Lead 2 is active
M LEAD 1	YES	M Lead 1 input at pins 41 and 42 is used
M LEAD 2	YES	M Lead 2 input at pins 15 and 16 is used
MODE	RPTR	Digital sections of channel 1 and 2 are interconnected, bypassing the analog sections when they are not in use. Select this position when the channels are bridged together in the repeater mode. BRDG switch also must be in the RPTR position.
SWITCH	**POSITION**	**DESCRIPTION**
BRDG (S1)	RPTR	Channels 1 and 2 are bridged together.
LPBK 1	OFF	Analog signals for Channel 1 are not looped back.
LPBK 2	OFF	Analog signals for Channel 2 are not looped back.

FIG. 6 - SWITCH AND STRAP LOCATIONS, 46105 DUAL VF 64KB CHANNEL



UPDATED

All straps and levels are factory-set. If necessary, refer to the steps below to align the 44022, 44118, and 46105 modules.

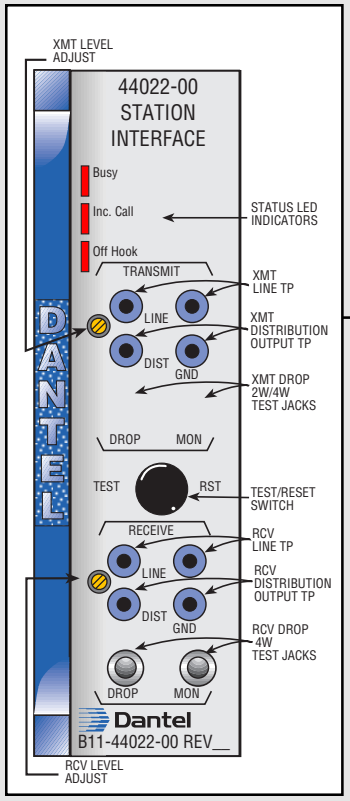
Equipment Required

- Signal Generator sending a 1kHz, 600 ohm signal at various levels.
- 600-ohm Level Meter (with and without 600-ohm termination).

44022 Subscriber Line Interface Alignment Procedure

Refer to Fig 7.

Fig. 7 - Front Panel, 44022



1. Remove power from the shelf.
2. Plug in the 44022-00 module.
3. Apply power. No LEDs should light. If the BUSY LED is on, press the TEST/RST button twice to turn the LED off.
4. Insert a test tone or test oscillator at the 4W RCV input (pins 2 and 4) or at the LINE RECEIVE test points. Insert a level meter (unterminated) at the LINE RECEIVE, test points.

   Set the frequency to approximately 1 KHz. Set the level to system test-tone level (-16 dBm).

***NOTE**: Any source device that loads down the input must be disconnected.*

5. Connect the level meter (600 ohm termination) to the DROP RECEIVE jack.
6. Read -13 dBm. Adjust the RECEIVE level control as required. RCV PAD is set for -3 to +16 dBm range.
7. When finished setting levels, press the TEST/RST button. The OFF HOOK LED goes off.
8. Remove the meter and test oscillator connections.
9. Insert the test oscillator at the DROP TRANSMIT jack.
10. "OFF-HOOK" LED lights.

***NOTE**: If the LED does not light, the oscillator is not providing a resistive path to ground. Place a 600 ohm load across the oscillator output.*

11. Connect an unterminated level meter across the oscillator terminals.
12. Set the level to 0 dBm
13. Move the level meter (terminated) to the LINE TRANSMIT test points. (The level meter should be unterminated if the VF bridge is plugged in.)

CONTINUED . . .

14. Read system test-tone level (+7 dBm). Adjust TRANSMIT level control as required.

NOTE: *Any source device that loads down the input must be disconnected.*

15. Disconnect the meter and test oscillator.

16. Connect an A18-05775-00 Speaker/Monitor panel to the Universal assembly A18-05776-XX by using a 8 wire RJ 45 cable with no twists in the make-up of the cable. Pin 1 to Pin 1, Pin 2 to Pin 2, etc. Connect to the RJ 1 connector of the Universal assembly and the RJ 1 connector of the A18-05775-00.

NOTE: *An alternative to a A18-05775-00 is a regular C13-41096-00 speaker / monitor panel connected to the RJ 1 connector of the A18-05776-00. The RJ plug would connect as follows:*

RJ1 CONNECTOR PIN ON A18-05776-XX	CONNECTED TO ORDER WIRE
1	P1-1
2	P2-6
3	P2-4
4	P2-2
5	P2-5
6	P2-1
7	P2-3
8	P1-9

17. Select the number one OW by pushing in the number one switch of the A18-05775-00.

18. Remove the handset of the A18-05775-00 and the number one LED on the panel should light.

19. Replace the handset and the LED should go off.

20. Remove the handset again and check B-7, Connector C1 Pin 34 and C2 Pins 11 and 12 for ground.

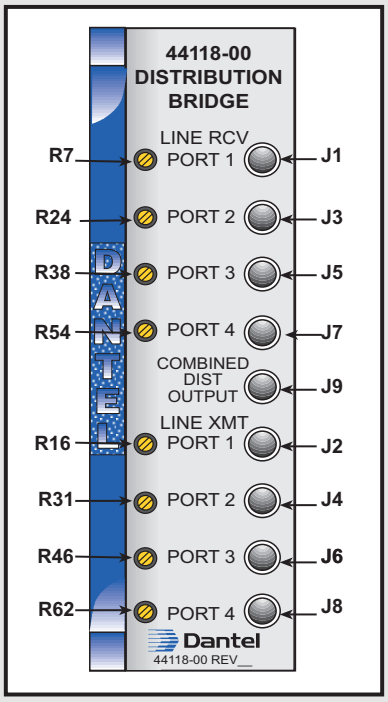
21. With the handset off-hook there should be -Battery between B, Pin 9 and B, Pin 10.

22. Replace the handset and the ground should be removed from B-7, C1 Pin 34, and C2 Pins 11 and 12, and the -battery should be removed from B Pin 9.

23. End of 44022 Alignment Procedure.

44118 Bridge Alignment Procedure

Fig. 8 - Front Panel, 44118



Refer to Fig 8.

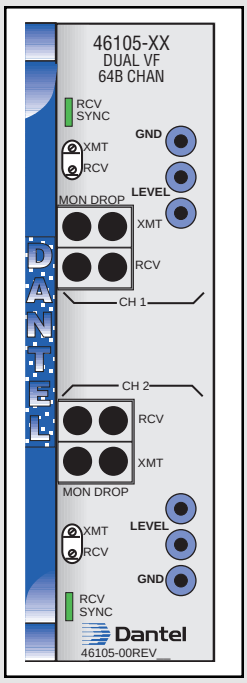
1. Remove power from the assembly
2. Plug in the 44118 module.
3. Apply power
4. Connect a 600-ohm terminated dB level meter across the 600-ohm output from the signal generator. Set generator frequency to approximately 1 KHz.
5. Adjust generator level for reading equal to system line receive test tone level +7 dBm for port 1.
6. Connect the 600-ohm terminated dB level meter to the COMBINED DIST OUTPUT jack (J9) on the 44118 front panel.
7. Leave the dB meter connected to J9 for following steps
8. Connect the signal generator to the LINE RCV PORT 1 jack (Jl) on the 44118 front panel.
9. Read distribution level on meter. Adjust the LINE RCV PORT I level control (R7) for reading of -10 dBm.
10. Move signal generator to the LINE RCV PORT 2 jack (J3).
11. Read distribution level on meter. Adjust the LINE RCV PORT 2 level control (R24) for reading of -10 dBm.
12. Move signal generator to the LINE RCV PORT 3 jack (J5).
13. Read distribution level on meter. Adjust the LINE RCV PORT 3 level control (R38) for reading of -10 dBm
14. Move signal generator to the LINE RCV PORT 4 jack(J7).
15. Read distribution level on meter. Adjust the LINE RCV PORT 4 level control (R54) for reading of -10 dBm
16. Leave the signal generator connected to J7. Do not change generator level. Do not readjust any receive level controls.
17. Move the 600-ohm terminated dB level meter to the LINE XMT PORT 1 jack (J2).
18. Read system line transmit test tone level -16 dBm for port 1. Adjust the LINE XMT PORT 2 level control (Rl6) for proper reading.
19. Move the 600-ohm terminated dB level meter to the LINE XMT PORT 2 jack (J4).
20. Read system line transmit test tone level -16 dBm for port 2. Adjust the LINE XMT PORT 2 level control (R31) for proper reading.
21. Move the 600-ohm terminated dB level meter to the LINE XMT PORT 3 jack (J6).
22. Read system line transmit test tone level -16 dBm for port 3. Adjust the LINE XMT PORT 3 level control (R46) for proper reading.

CONTINUED . . .

23. Move signal generator to the LINE RCV PORT 1 jack (Jl). Do not readjust any receive level controls. Move the 600-ohm terminated dB level meter to the COMBINED DIST OUTPUT jack (J9).
24. Read -10 dBm.
25. Move the 600-ohm terminated dB level meter to the LINE XMT PORT 4 jack (J8).
26. Read system line transmit test tone level -16 dBm for port 4. Adjust the LINE XMT PORT 4 level control (R62) for proper reading.
27. Calibration for the 44118 is now complete. Remove the signal generator and dB meter.
28. Remove the 46105 and the 44022 if they are not already removed.
29. Insert a 1 KHz Tone at a +7 dBm level into port 1 RCV port and verify that the tone can be seen at C1 Pins 31 and 6, Pins 33 and 8, Pins 29 and 4, and at B Pins 5 and 6. Level meter should be terminated and it should read -16 dBm.
30. Move the 1 KHz tone to Port 3 RCV input and verify that the tone can be seen at C1 Pins 27 and 2 at a -16 dBm level.
31. Connect the level meter (terminated) to the summing distribution port. Set the oscillator for a 1 KHz tone at a +7 dBm level and connect it to B 3 andB 4, observe the level meter, it should read -10 dBm.
32. Move the oscillator to C1 Pins 28 and 3 and observe the level meter for a -10 dBm reading
33. Move the oscillator to C1 Pins 32 and 7 and observe the level meter for a -10 dBm reading
34. Move the oscillator to C1 Pins 26 and 1 and observe the level meter for a -10 dBm reading
35. Move the oscillator to C1 Pins 30 and 5 and observe the level meter for a -10 dBm reading
36. Remove power, and plug the 44022 back in
37. Reapply power
38. Listen to the speaker for a 1 KHz tone.
39. Place an audio amplifier with a speaker attached to it to B pins 8 and 10. The 1 KHz tone should be heard.
40. End of 44118 Alignment Procedure.

46105 DUAL VF 64KB CHANNEL ALIGNMENT PROCEDURE

FIG. 9 - FRONT PANEL, 46105



Refer to Fig 9.

1. To check the Audio Port Levels, other parts of the system do not have to be functioning.
2. Set the loopback (LPBK) switches for both channels to the ON position.
3. Remove power
4. Install the module in the proper slot of the equipment shelf. (Slot 1)
5. Apply power to the assembly.
6. Insert a -16 dBm, 600-ohm signal of 1 KHz into the DROP XMT jack for channel 1 on the front panel if the module.
7. Using a 600-ohm, unterminated dB meter, read a level of 0 dB at the blue front panel XMT LVL test points for channel 1. If the level is not correct, adjust the front panel transmit potentiometer.
8. Install a 600-ohm termination on the dB meter and connect the meter to the DROP RCV jack for channel 1 on the front panel. Verify a level of +7 dB. If the level is not correct, adjust the front panel receive potentiometer.
9. Insert a -16 dBm, 600-ohm signal of 1 KHz into the DROP XMT jack for channel 2 on the front panel of the module.
10. Using a 600-ohm, unterminated dB meter, read a level of 0 dB at the blue front panel XMT LVL test points for channel 2. If the level is not correct, adjust the front panel transmit potentiometer.
11. Install a 600-ohm termination on the dB meter and connect the meter to the DROP RCV jack for channel 2 on the front panel. Verify a level of +7 dB. If the level is not correct, adjust the front panel receive potentiometer.
12. Turnoff the power.
13. Remove the module and place the loopback switches in the OFF position.
14. Verify that the BRDG switch is in the RPTR position.
15. Reinstall the module and turn on power.
16. Insert a -16 dBm, 600-ohm, 1 KHz signal in the channel 1 DROP XMT jack on the module's front panel.
17. Verify with the dB meter (not terminated) a level of 0 dB at the front panel blue XMT LVL test points for both channels 1 and 2.
18. Terminate the meter with 600 ohms and verify a level of +7 dB at the front panel RCV DROP jack of channel 2.
19. With the meter still terminated, verify the level at the front panel RCV DROP jack of channel 1 is -40 dB or more negative.
20. Move the input signal from the channel 1 XMT DROP jack to the channel 2 XMT DROP jack.

CONTINUED . . .

21. Remove the termination from the dB meter and verify a level of 0 dB at the front panel blue XMT LVL test points for both channels 1 and 2.

22. Terminate the meter with 600 ohms and verify a level of +7 dB at the front panel RCV DROP jack of channel 1.

23. With the meter still terminated, verify the level at the front panel RCV DROP jack of channel 2 is -40 dB or more negative.

24. Move the signal generator to C2 pins 20 and 45.

25. Move the level meter to C2 pins 19 and 45

26. Verify a level of +7 dBm

27. Remove the signal generator and dB meter.

28. Using connector C2 connect the A18-05776-XX assembly to two B11-46105-00 systems that are in the working in the terminal mode. One will be connected to channel 1 and the other to channel 2.

29. On the C2 connector of the A18-05776-00 that is used to connect to the terminal mode 46105 modules, jumper pins 12 to 37 and 11 to 36.

30. Talk through the system in both directions and verify the module works properly.

31. Verify that the green LEDs on the front panel light steadily for the channel(s) that you are using. When a light is on, it means the framing bit is being detected by the digital section of that channel of the module, indicating synchronization of data transmitted to it.

32. Operation of the 46105 module consists of talking through the system in either direction. The front panel RCV SYNC LED for the channel that you are using lights steadily if the data being received is in synchronization with the transmitting unit.

33. If the module is working in the repeater mode and the synchronization signal is lost in either direction, the unit automatically reverts to the terminal mode, allowing continued communications in the direction from which the synchronization is still being received. When synchronization is re-established, repeater operation resumes. Verify that that a loss of a terminal from one direction has no effect on the opposite direction of the system.

34. With the Order Wires talking to one another, remove the handset and hit the Touch Tone pad on the A18-05775-00 and verify that the tones can be heard at the other OW sites.

35. Hang up the handset.

36. At the remote location, on the Channel 1 side of the 46105, remove a handset and verify that C2 Pins 39 and 40 of the A18-05776-01 are closed.

CONTINUED . . .

ALIGNMENT PROCEDURES

37. Hang up the handset and Pins 39 and 40 should go open.

    Use the other terminal 46105 and repeat the process for Channel 2 and check Pins 7 and 8.

38. End of 46105 Alignment Procedure.

OPERATION

Operation of the 05776 Universal Order Wire shelf, when used in conjunction with a 05775 Speaker Panel is simple and straight-forward. Use the steps below.

1. An 05775 Speaker panel will connect to the 05776 Universal OW assembly using an 8 conductor RJ 45 connector that has male connectors on each end. The cable must be straight through with no nulls in it. The connector will connect between RJ 1 of the OW assemblies and RJ 1, RJ 2 or RJ 3 of the speaker/monitor panel.
2. Remove the handset with the appropriate button selected for the OW that is going to be seized.
3. The LED on the associated button on the 05775 will light indicating that the unit is seized.
4. If the OW unit is equipped with a 46105 module, the M lead will turn on and the 46105 will be activated. The 46105 module will convert the analog signal from the OW user to a 64Kb RS-422 synchronous digital signal and convert a 64Kb digital signal back into an analog VF signal for the OW.
5. When the handset is off hook, the local speaker for the associated OW will turn off and you can call whoever you need to call. Additionally, DTMF tones can be sent to activate the VNET Off-Net PBX interface.
6. When the bridge is used in the application, ports 1, 2, and 3 of the bridge will transmit what the OW user is saying, or any DTMF tones that are being sent.
7. When a remote OW user answers, he will pick up his handset and conversation can take place over the handsets.

TECHNICAL SPECIFICATIONS

DESCRIPTION	VALUE
Input Voltage Range	-21 to -56 VDC
Input Power Requirement	
@ -24VDC	
Idle	164 mA
Full Load	174 mA
@ -48VDC	
Idle	85 mA
Full Load	182 mA
Heat Dissipation	
@ -24VDC	
Idle	23.2 BTU/Hr
Full Load	46.2 BTU/Hr
@ -48VDC	
Idle	27.9 BTU/Hr
Full Load	50.9 BTU/Hr
Physical Dimensions	
19"	19" x 8.25" x 1.72"
23"	23" x 8.25" x 1.72"
Weight	6.75 lbs
Operating Temperature Range	0° to 60° C.

NOTES

WARRANTY

LIMITED WARRANTY

The Seller warrants that the standard hardware products sold will be free from defects in material and workmanship and perform to the Seller's applicable published specifications for a period of 18 months for hardware, and 3 months for software, from the date of the original invoice. The liability of the Seller hereunder shall be limited to replacing or repairing, at its option, any defective products which are returned F.O.B. to the Seller's plant, (or, at the Seller's option, refunding the purchase price of such products). In no case are products to be returned without first obtaining permission and a customer return authorization number from the Seller. In no event shall the Seller be liable for any consequential or incidental damages.

Equipment or parts which have been subject to abuse, misuse, accident, alteration, neglect, unauthorized repair or installation are not covered by warranty. The Seller shall make the final determination as to the existence and cause of any alleged defect. No warranty is made with respect to custom equipment or products produced to the Buyer's specifications except as specifically stated in writing by the Seller in the contract for such custom equipment.

This warranty is the only warranty made by the Seller with respect to the goods delivered hereunder, and may be modified or amended only by a written instrument signed by a duly authorized officer of the Seller and accepted by the Buyer.

Warranty and remedies on products not manufactured by the Seller are in accordance with warranty of the respective manufacturer. THE SELLER MAKES NO OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED; AND ALL IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEEDS THE AFORESAID OBLIGATIONS IS HEREBY DISCLAIMED BY THE SELLER.

IN CASE OF DIFFICULTY

If you experience difficulty with this equipment, check the following, as appropriate:

1. **Switch settings**
2. **Signal levels**
3. **Software configuration**
4. **Connections between Dantel's equipment and your equipment.**

If there is still a problem, substitute equipment that is known to be good. For additional assistance, call Dantel's Technical Field Service Department weekdays, 6 A.M. to 5 P.M. pacific time:

1-800-4DANTEL (1-800-432-6835).

If a thorough checkout shows a piece of equipment has malfunctioned, you may return it to the factory. For repairs and emergency replacements, obtain a Return Material Authorization (RMA) number from the Customer Service Representative at **1-800-4DANTEL** (1-800-432-6835).

To ensure expedient processing of your order, provide a purchase order number and shipping and billing information when requesting an RMA number. Also, when the units are returned to Dantel, include a description of the failure symptoms for each unit returned. Send defective equipment to:

Dantel, Inc. • 2991 North Argyle Avenue • Fresno, California 93727-1388

Dantel

P.O. Box 55013 • Fresno, CA 93747-5013 Phone (209) 292-1111 Fax (209) 292-9355 http://www.dantel.com