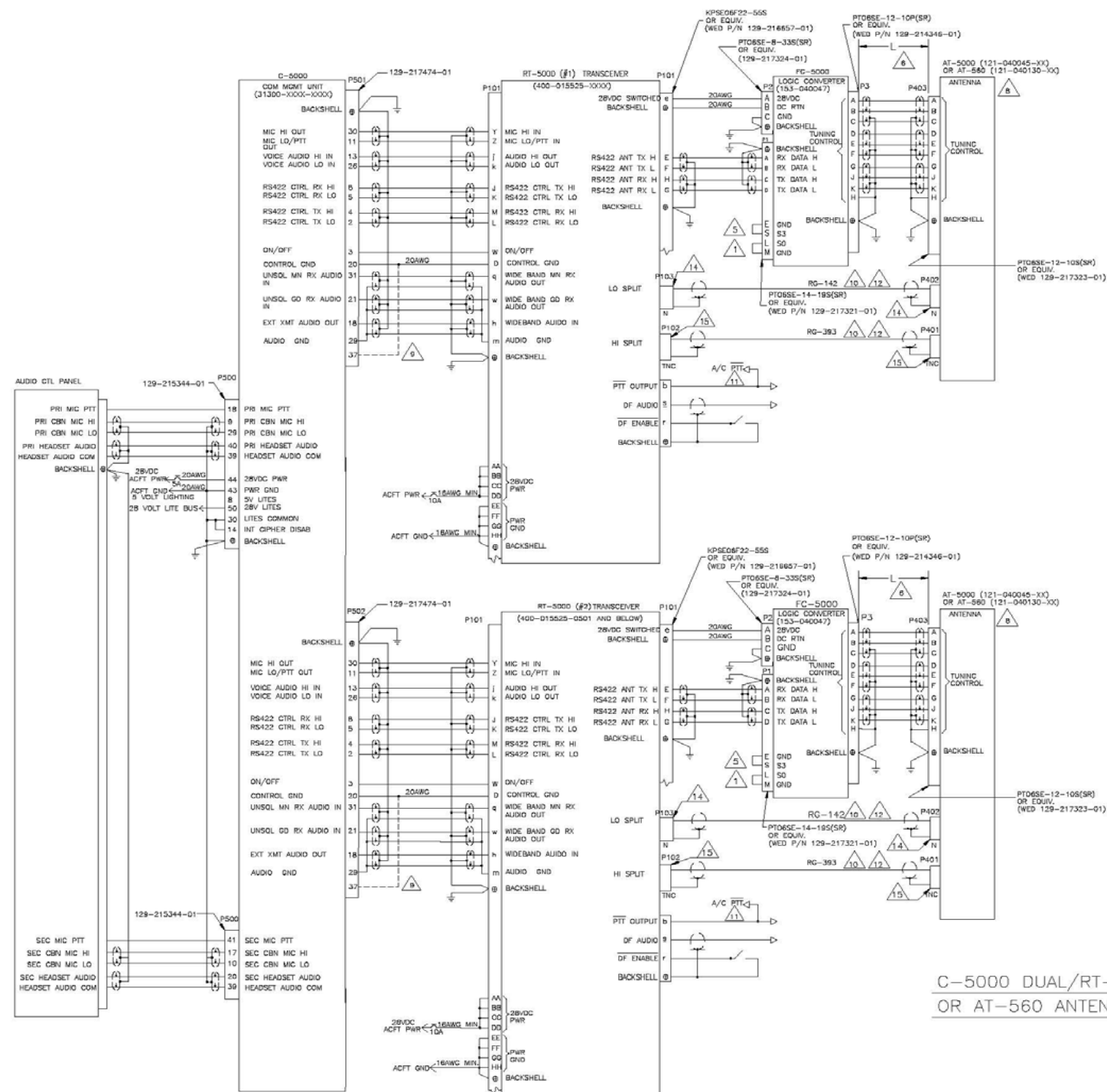




C-5000 COMMUNICATION MANAGEMENT CONTROLLER INSTALLATION MANUAL



GENERAL NOTES:

1. Leave pins L and M unconnected when using AT-560 antenna. Connect for AT-5000 Antenna.
2. All wire is 24AWG unless otherwise noted.
3. Each GND symbol denotes a 1/4 in wide braided pigtail.
4. Make all shield drain wires as short as possible (<1in).
5. Leave pin S to pin E open for default to 243.0 MHz tuning on power up or data bus failure. Connect pin S to pin E for default to 121.5 MHz tuning on power up or data bus failure.
6. Cable length L to be 25 feet max.
7. REMOVED.
8. On any type AT-5000 connect P403 to J1. Ant type AT-560 connect P403 to J3.
9. Pin D of the RT-5000 P101 may be connected to pin 20 or pin 37 or both. This will allow compatibility with previous versions of the installation drawings.
10. Other cable types may be substituted, however cable loss will affect communications range and quality.
11. A/C PTT should be open collector to allow an OR function with the open collector output of pin b.
12. Coaxial relay switches are required for use with DF Systems. Refer to DF system manufacturers installation manuals for more information.
13. The following is related to DF system installation.
 - A. DF audio is available on pin s from the Main receiver only. DF functionality is not available for channels that use the guard receiver module.
 - B. DF audio is enabled by grounding pin r via an external switch provided by the customer.
 - C. ***When using a DF system with a -06XX or above P/N RT-5000, be aware that during OTAR, Trunking, Telephone modes of operation, the RT-5000 will transmit without PTT OUTPUT or A/C PTT being grounded. DO NOT HAVE THE DF SYSTEM ENABLED IF OPERATING ONE OF THESE MODES.
14. 129-049112-01 Connector, Plug, Crimp Type, Straight, N, RG-142 or 129-049113-01 Connector, Plug, Crimp Type, Right Angle, N, RG-142.
15. 129-041397-01 Connector, Plug, Crimp Type, Straight, TNC, RG-393 or 129-041398-01 Connector, Plug, Crimp Type, Right Angle, TNC, RG-393

C-5000 DUAL/RT-5000 (-0501 AND BELOW) SYSTEM WITH AT-5000
OR AT-560 ANTENNA SYSTEM AND DF INSTALLATION NOTES

Figure 4-11l. Flexcomm II System Interconnect Drawing (Sheet 12 of 17)
Dwg No. 152-140131, Rev. L



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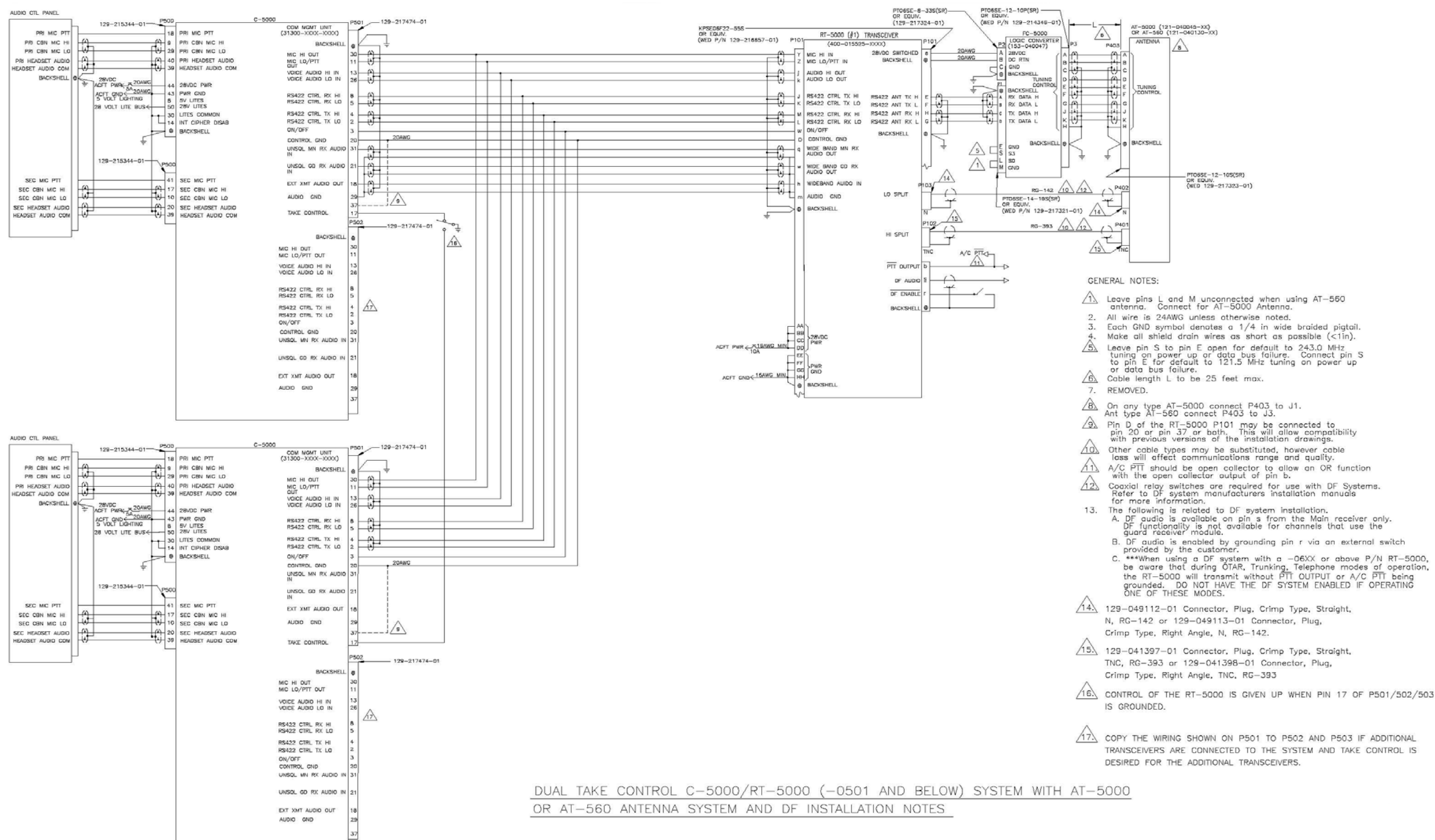


Figure 4-11m.Flexcomm II System Interconnect Drawing (Sheet 13 of 17)

Dwg No. 152-140131, Rev. L



C-5000 COMMUNICATION MANAGEMENT CONTROLLER INSTALLATION MANUAL

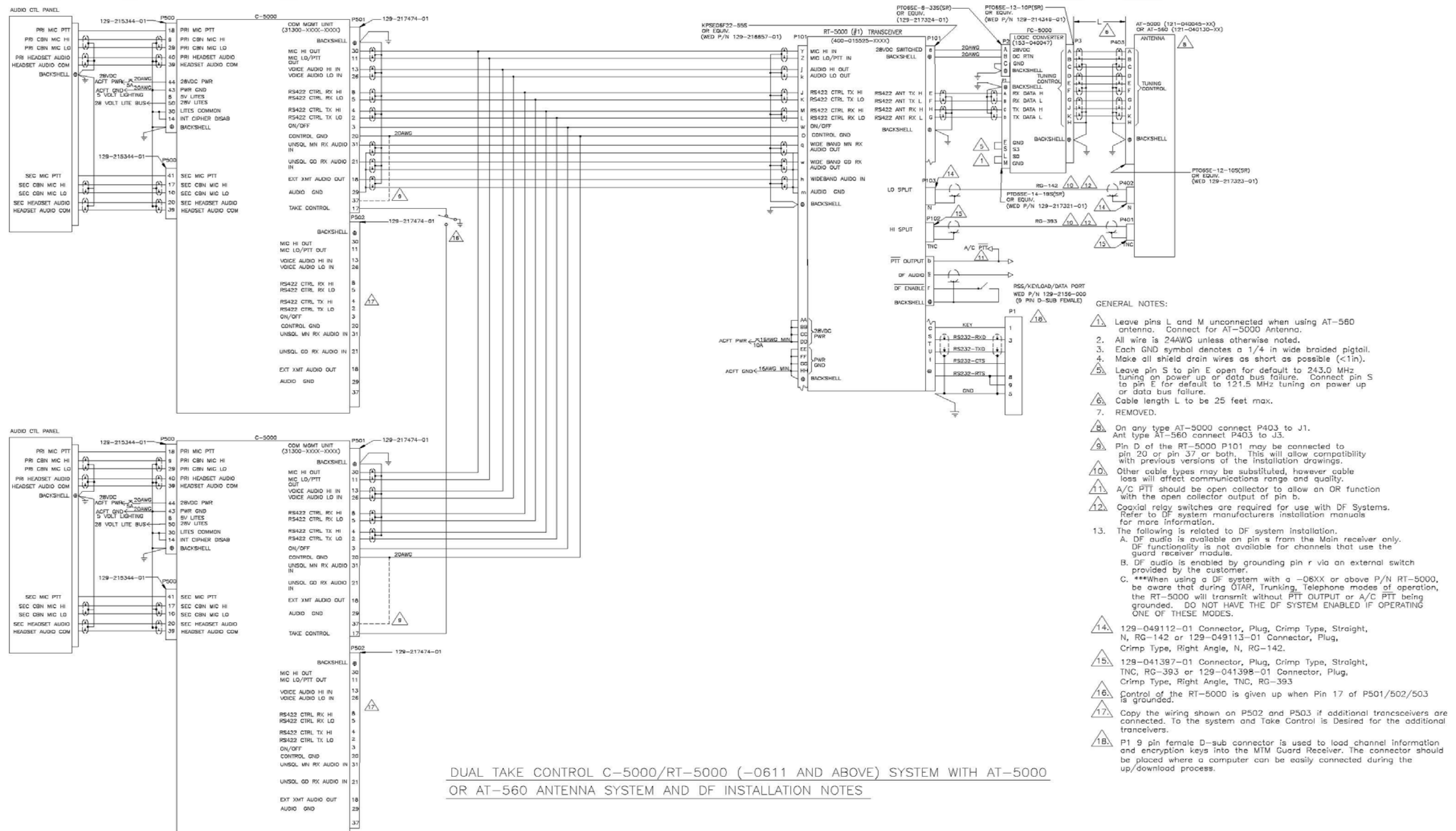


Figure 4-11n. Flexcomm II System Interconnect Drawing (Sheet 14 of 17)
Dwg No. 152-140131, Rev. L



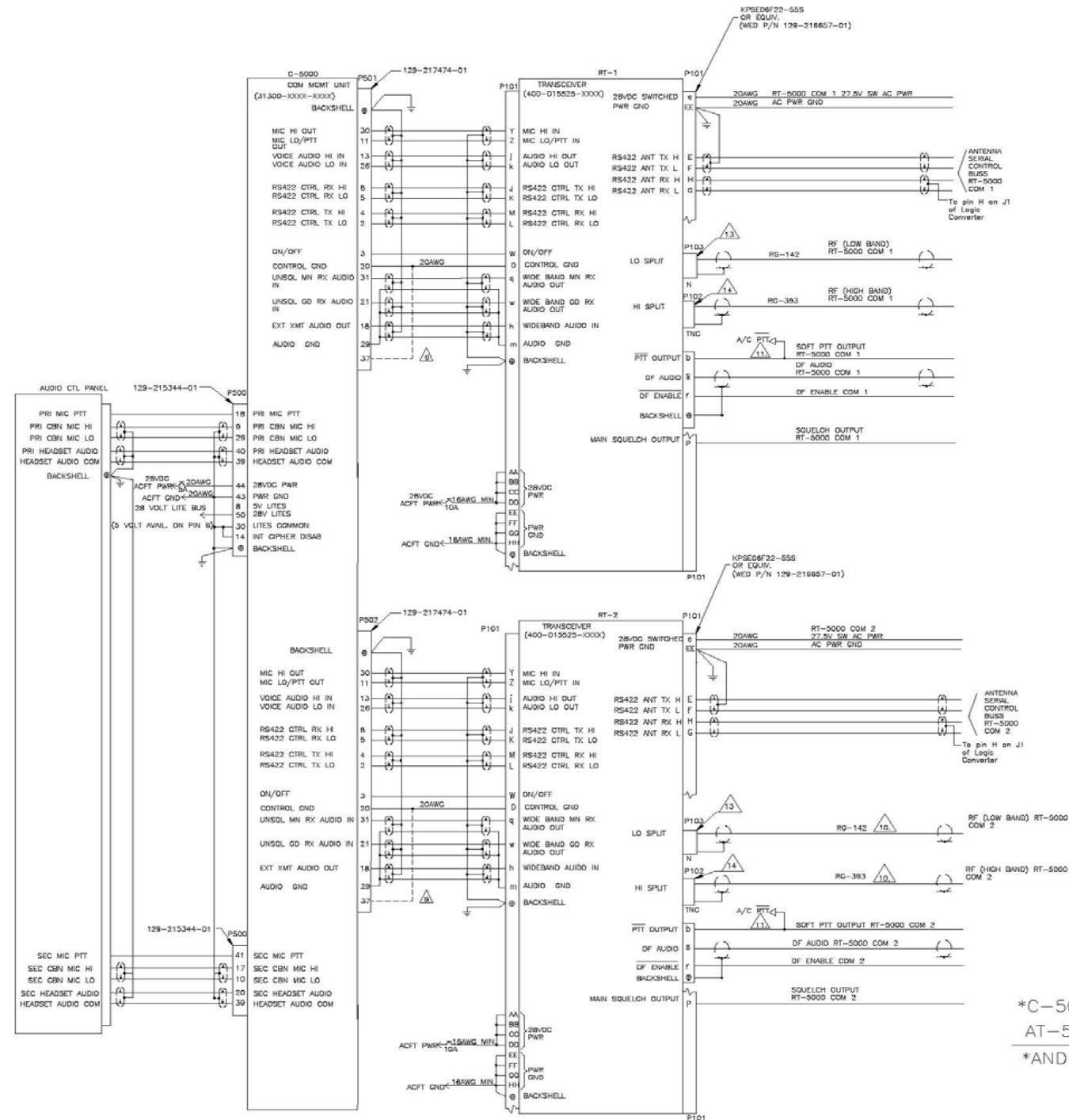
GENERAL NOTES:

- C-5000 DUAL/RT-5000 (-0611 AND ABOVE) SYSTEM WITH AT-5000
OR AT-560 ANTENNA SYSTEM AND DF INSTALLATION NOTES

Section 4 –Electrical Installation



C-5000 COMMUNICATION MANAGEMENT CONTROLLER INSTALLATION MANUAL



GENERAL NOTES:

1. Leave pins L and M unconnected when using AT-560 antenna. Connect for AT-5000 Antenna.
2. All wire is 24AWG unless otherwise noted.
3. Each GND symbol denotes a 1/4 in wide braided pigtail.
4. Make all shield drain wires as short as possible (<1in).
5. Leave pin S to pin E open for default to 243.0 MHz tuning on power up or data bus failure. Connect pin S to pin E for default to 121.5 MHz tuning on power up or data bus failure.
6. Cable length L to be 25 feet max.
7. REMOVED.
8. On any type AT-5000 connect P403 to J1. Ant type AT-560 connect P403 to J3.
9. Pin D of the RT-5000 P101 may be connected to pin 20 or pin 37 or both. This will allow compatibility with previous versions of the installation drawings.
10. Other cable types may be substituted, however cable loss will affect communications range and quality.
11. A/C PTT should be open collector to allow an OR function with the open collector output of pin b. This connection is not required if the system is used with the Chelton 7-443 switch box.
12. The following is related to DF system installation, guard receiver module.
 - A. DF audio is available on pin s from the Main receiver only. DF functionality is not available for channels that use the provided by the customer.
 - B. DF audio is enabled by grounding pin r via an external switch
 - C. ***When using a DF system with a -06XX or above P/N RT-5000, be aware that during OTAR, Trunking, Telephone modes of operation, the RT-5000 will transmit without PTT OUTPUT or A/C PTT being grounded. DO NOT HAVE THE DF SYSTEM ENABLED IF OPERATING ONE OF THESE MODES.
13. 129-049112-01 Connector, Plug, Crimp Type, Straight, N, RG-142 or 129-049113-01 Connector, Plug, Crimp Type, Right Angle, N, RG-142.
14. 129-041397-01 Connector, Plug, Crimp Type, Straight, TNC, RG-393 or 129-041398-01 Connector, Plug, Crimp Type, Right Angle, TNC, RG-393

*C-5000 DUAL/RT-5000 (-0501 AND BELOW) SYSTEM WITH AT-5000 OR AT-560 ANTENNA SYSTEM

*AND CHELTON DF SYSTEM USING 7-443 SWITCH BOX.

Figure 4-11p. Flexcomm II System Interconnect Drawing (Sheet 16 of 17)
Dwg No. 152-140131, Rev. L



1. Leave pins L and M unconnected when using AT-5600 antenna. Connect for AT-5000 Antenna.
2. All wire is 24AWG unless otherwise noted.
3. Each GND symbol denotes a 1/4 in wide braided pigtail.
4. Make all shield drain wires as short as possible (<1in).
5. Leave pin S to pin E open for default to 243.0 MHz tuning on power up or data bus failure. Connect pin S to pin E for default to 121.5 MHz tuning on power up or data bus failure.
6. Cable length L to be 25 feet max.
7. P1 9 pin female D-sub connector is used to load channel information and encryption keys into the MTM Guard Receiver. The connector should be placed where a computer can be easily connected during the up/download process.
8. On any type AT-5000 connect P403 to J1.
Ant type AT-560 connect P403 to J3.
9. Pin D of the RT-5000 P101 may be connected to pin 20 or pin 37 or both. This will allow compatibility with previous versions of the installation drawings.
10. Other cable types may be substituted, however cable loss will affect communications range and quality.
11. A/C PTT should be open collector to allow an OR function with the open collector output of pin b. This connection is not required if the system is used with the Chelton 7-443 switch box.
12. The following is related to DF system installation.
guard receiver module.
 - A. DF audio is available on pin s from the Main receiver only.
DF functionality is not available for channels that use the provided by the customer.
 - B. DF audio is enabled by grounding pin r via an external switch
 - C. ***When using a DF system with a -Q6XX or above P/N RT-5000, be aware that during OTAR, Trunking, Telephone modes of operation, the RT-5000 will transmit without PTT OUTPUT or A/C PTT being grounded. DO NOT HAVE THE DF SYSTEM ENABLED IF OPERATING ONE OF THESE MODES.
13. 129-049112-01 Connector, Plug, Crimp Type, Straight, N, RG-142 or 129-049113-01 Connector, Plug, Crimp Type, Right Angle, N, RG-142.
14. 129-041397-01 Connector, Plug, Crimp Type, Straight, TNC, RG-393 or 129-041398-01 Connector, Plug, Crimp Type, Right Angle, TNC, RG-393

*C-5000 DUAL/RT-5000 (-0611 AND ABOVE) SYSTEM WITH AT-5000 OR AT-560 ANTENNA SYSTEM

*AND CHELTON DF SYSTEM USING 7-443 SWITCH BOX.

Publication No. 150-041118

C-5000 COMMUNICATION MANAGEMENT CONTROLLER INSTALLATION MANUAL

NOTES:

1. ALL RT-138F AND RT-406F TRANSCEIVERS ARE INHERENTLY ENCRYPTION OR DIGITAL CODED SQUELCH COMPATIBLE. UNITS WITH A -05X PART NUMBER SUFFIX ARE COMMONLY REFERRED TO AS ENCRYPTION COMPATIBLE DUE TO THE SPECIFIC WIRING CHANGES TO THE CHASSIS WHICH FACILITATES INSTALLATION WITH AN ENCRYPTION SYSTEM WIRED DIRECTLY TO THE RADIO. THE C-5000 PROVIDES FOR SHARED ENCRYPTION WITH A SINGLE ENCRYPTION FUNCTION AT THE C-5000 AND RADIO UNIT SELECTION FROM THE C-5000. FOR THOSE INSTALLATIONS, CONNECT STD (-00X) RADIO UNITS AS SHOWN IN POSITION 1 AND REFER TO THE C-5000 SYSTEM INTERCONNECT DIAGRAM 147-014995 FOR SPECIFIC DETAILS OF THE C-5000 INTERFACE TO ENCRYPTION EQUIPMENT.
2. TRANSFER BETWEEN TRANSCEIVERS IS AUTOMATIC AND THE APPROPRIATE TRANSCEIVER WILL BE ACTIVE AS CONTROLLED BY THE BCD CHANNELLING FROM THE CONTROL UNIT. THE SYSTEM MAY NOT BE CONFIGURED WITH MORE THAN ONE (1) TRANSCEIVER OF THE SAME FREQUENCY RANGE. CONSULT GLOBAL-WULFSBERG CUSTOMER ENGINEERING WHEN USING AN RT-450 AND AN RT-406F IN THE SAME INSTALLATION.
SHOULD THE VHF AM RT-118 BE REQUIRED TO COVER THE FREQUENCY RANGE OF 118 TO 150 MHZ, BOTH THE RT-118 AND THE RT-138(F) MUST BE MODIFIED. CONSULT GLOBAL-WULFSBERG CUSTOMER ENGINEERING.
A SEPARATE ANTENNA IS REQUIRED FOR EACH TRANSCEIVER.
REPEAT APPROPRIATE CONNECTIONS AS REQUIRED FOR ADDITIONAL ENCRYPTION OR NON-ENCRYPTION TRANSCEIVERS. DO NOT INTERCHANGE ENCRYPTION TRANSCEIVERS AND NON-ENCRYPTIONS TRANSCEIVERS (-05X AND -00X) WITHIN THE WIRING HARNESS.
3. A COMMON APPROPRIATELY RATED CIRCUIT BREAKER MAY BE USED INSTEAD OF SEPARATE CIRCUIT BREAKERS.
WIRE SIZE TO THE CIRCUIT BREAKER SHOULD BE CHANGED ACCORDINGLY.
4. GUARD RECEIVER AUDIO MAY BE TRANSFERRED FROM AN UNCHANNELED TRANSCEIVER TO THE ACTIVE TRANSCEIVER BY CONNECTING TOGETHER THE GUARD AUDIO TRANSFER LINES AND THE GUARD SQUELCH CONTROL TRANSFER LINES. AS AN EXAMPLE, THIS ALLOWS MONITORING A UHF GUARD CHANNEL WHILE A VHF CHANNEL IS SELECTED.
CAUTION: IF TWO OR MORE TRANSCEIVERS ARE CONNECTED WITH COMMON GUARD AUDIO TRANSFER AND GUARD SQUELCH CONTROL TRANSFER LINES, ONLY ONE (1) TRANSCEIVER MAY HAVE A GUARD RECEIVER MODULE INSTALLED. IF MORE THAN ONE (1) TRANSCEIVER HAS A GUARD RECEIVER MODULE INSTALLED, THE GUARD TRANSFER LINES MUST BE LEFT UNCONNECTED TO THE ADDITIONAL TRANSCEIVERS WITH THE INSTALLED GUARD MODULE.
5. IF AN EXTERNAL DECODER IS USED WITH THE GUARD RECEIVER AND THE GUARD TRANSFER PINS ARE CONNECTED PER NOTE 4, THEN THE GUARD AUDIO INHIBIT PINS MUST ALSO BE PARALLEL CONNECTED.
6. ANTENNA CABLE PLUG CONNECTOR TYPE "N" MATES WITH TYPE "N" BULKHEAD JACK (FM TRANSCEIVERS). CABLE PLUG TYPE "BNC" MATES WITH TYPE "BNC" BULKHEAD JACK (AM TRANSCEIVERS).
A) TYPE "N" CABLE PLUG FOR 58A/U -UG 536B/U OR EQUIVALENT.
B) TYPE "N" CABLE PLUG FOR RG 8/U -U6 1185A OR EQUIVALENT.
7. PIN OUTS ARE PROVIDED FOR EXTERNAL CARRIER ENCODED SQUELCH DECODERS AND CARRIER ENCODERS. THE Tx SWITCHED +V VDC OUTPUT WILL BE ACTIVE IN ALL UNITS DURING TRANSMIT. MULTIPLE NON-ENCRYPTION TRANSCEIVERS CAN UTILIZE A COMMON ENCODER BY PARALLEL CONNECTING THE EXTERNAL ENCODE IN LINES. DO NOT USE EXTERNAL ENCODERS/DECODERS WITH ENCRYPTION UNITS.
WHEN USING THE C-5000 ENCRYPTION OR ENCODE FUNCTIONS, AN RT-138F OR RT-406F CAN BE CONNECTED FOR AUTO C-5000 R/T SELECTION. IF ENCRYPTION UNITS ARE INTERNAL OR EXTERNAL TO THE C-5000, THEN THE EXTERNAL ENCODE INPUT MUST BE CONNECTED AT THE C-5000.
8. FM TRANSCEIVER CABLE PLUG TYPE BT06AC-24-61S OR EQUIVALENT MATES WITH BT02A24-61P. VHF AM TRANSCEIVER CABLE PLUG TYPE BT06AC-18-32S OR EQUIVALENT MATES WITH BT02A-18-32P. CONTROL HEAD CABLE PLUG TYPE P50X GWS P/N 129-215344-02 (POSITRONICS 00D62F00Y60C-914.2)
THIS CONNECTOR HAS 1 EACH MALE/FEMALE JACK SCREW WITH MALE NEAR PIN 1.
9. ALL WIRE NO. 24 AWG OR GREATER UNLESS OTHERWISE INDICATED.
ANTENNA COAX CABLE RG 8, 8A, 8 FOAM, 58A, 58C 58A FOAM, OR EQUIVALENT.
10. MOTOROLA, DVP/DES ARE REGISTERED TRADEMARKS OF MOTOROLA, INC.
11. GE, D.V.G. & VOICE GUARD ARE REGISTERED TRADEMARKS OF GENERAL ELECTRIC, INC.
12. SEE "INSTALLATION WIRING CONSIDERATIONS" SECTION OF INSTALLATION MANUAL FOR PERTINENT ADDITIONAL INFORMATION TO THIS DIAGRAM.
13. PINS C, D, L, M, N, T, X OF P-210 ON FM TRANSCEIVERS HAVE BEEN RE-ASSIGNED IN -F MODEL TRANSCEIVERS (-05X). DO NOT INTERCHANGE -00X AND -X5X TRANSCEIVERS AS DAMAGE MAY RESULT. ONLY RT-406F'S (400-012785-5X) AND RT-138F'S (400-014525-5X) TRANSCEIVERS ARE CONFIGURED FOR DIRECT MOTOROLA DVP/DES OR G.E. VOICE GUARD CONNECTIONS AS SHOWN. ALL RT-138F'S AND RT-406F'S ARE COMPATIBLE WITH ENCRYPTION OR DIGITAL CODED SQUELCH MODULATION SCHEMES. AN F MODEL RADIO (-00X) CAN BE CONNECTED AS SHOWN IN THE FIRST TRANSCEIVER POSITION AND UTILIZED WITH ENCRYPTION EQUIPMENT CONNECTED TO THE C-5000. (SEE INSTALLATION WIRING DIAGRAM 147-014995).
14. DVP/DES CONNECTORS. (MOTOROLA P/N'S 14-84556804 AND 14-84556816). THE 1.5K OHM 1/4W RESISTOR, AND THE 6.2V ZENER DIODE ARE CUSTOMER SUPPLIED. PIN T OF ENCRYPTION TRANSCEIVERS HAS BEEN REASSIGNED FOR ENCRYPTION USE. CONNECT ALL TRANSCEIVERS AS SHOWN. THIS DOES NOT AFFECT OPERATION OF STANDARD TRANSCEIVERS. WHEN INSTALLING MOTOROLA DVP/DES UNITS WITH FLEXCOMM RADIOS CONSULT 100-014648 TECHNICAL CONSIDERATIONS DOCUMENT AND FLEXCOMM TECHNICAL UPDATES FOR ADDITIONAL INFORMATION.
15. REFER TO 147-0121-000 FOR EXISTING FLEXCOMM INSTALLATIONS.
16. GE VOICE GUARD INTERCONNECT FOR DEDICATED VOICE GUARD INSTALLATIONS.
GE P/N'S 19C320257P1 P1, P2, P3, P4
19A116781P4 CONTACTS 16 REQ'D.
17. WHEN INSTALLING GE VOICE GUARD UNITS WITH FLEXCOMM RADIOS, CONSULT 100-014716 TECHNICAL CONSIDERATIONS DOCUMENT AND THE FLEXCOMM TECHNICAL UPDATES FOR ADDITIONAL INFORMATION.
18. THE FC-1 WAS HIGHLY RECOMMENDED FOR FLEXCOMM INSTALLATIONS AND MAY REMAIN WHEN C-1000'S ARE REPLACED BY C-5000 CONTROL UNITS. HOWEVER, IT IS NOT NEEDED. THE SWITCHED 27.5VDC PRODUCED BY THE FC-1 MAY BE CONSIDERED FOR SUPPLYING THE C-5000 SYSTEM ALTHOUGH THE 27.5VDC AND GROUND INPUTS TO THE C-5000 ARE ON THE SYSTEM INTERFACE CONNECTOR P500 (SEE WIRING DIAGRAM 147-014995).
19. THIS WIRING DIAGRAM (147-014991) PERTAINS TO THE FLEXCOMM TRANSCEIVER INTERFACE CONNECTOR P50X OF THE C-5000. SEE INTERCONNECT WIRING DIAGRAM 147-014995 FOR THE SYSTEM INTERFACE P500.
A C-5000 CAN INCLUDE UP TO 3 RT INTERFACE TRANSCEIVER CONNECTIONS P50X (P501, P502, P503). SPECIAL MARKING OF THE CONNECTORS IS RECOMMENDED TO ASSURE PROPER MATING OF SYSTEM 1, 2, OR 3 CONNECTIONS.
20. THE "TAKE CONTROL" PIN IS NORMALLY OPEN CIRCUITED. IN A DUAL C-5000 SYSTEM, WIRE THE TRANSCEIVER INTERFACE IN PARALLEL TO BOTH C-5000 UNITS. CONNECT THE "TAKE CONTROL" PIN FROM EACH C-5000 TO A SWITCH SUCH THAT ONE OR THE OTHER C-5000 TRANSCEIVER IS ALWAYS SUPPLIED WITH A GROUND WHICH TAKES CONTROL AWAY FROM THE UNIT WITH THE GROUNDED PIN. WITH THREE TRANSCEIVER INTERFACES IN DUAL C-5000 SYSTEMS, 3 SEPARATE TAKE CONTROL SWITCHES ARE REQUIRED (ONE FOR EACH PAIR OF TRANSCEIVER INTERFACES).
21. THE ZEROIZE FUNCTION PROVIDES AN OUTPUT FROM THE C-5000 TO ENCRYPTION EQUIPMENT TO ERASE KEY VARIABLES. THE OUTPUT CAN BE CONFIGURED ONE OF TWO WAYS: NORMALLY OPEN CIRCUIT WITH ACTIVE GROUND TO ZEROIZE OR NORMALLY OPEN AND ACTIVE 27.5VDC TO ZEROIZE. STANDARD CONFIGURATION IS ACTIVE GROUND TO ZEROIZE. JUMPER AXJP1 ON THE RT INTERFACE BOARD CAN BE MOVED FROM "1 TO 2" TO "2 TO 3" TO YIELD ACTIVE 27.5VDC FOR ZEROIZE.
22. ONLY ONE UNSQUELCHED MAIN AUDIO INPUT MAY BE CONNECTED TO THE C-5000 AT ONE TIME.

Figure 4-13a. FLEXCOMM I Transceivers Installation Wiring Diagram (Sheet 1 of 5)
RT-30, RT-118, RT-138, RT-138F, RT-450 and RT-406F
(Dwg No 147-014991, Rev B)

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INSTALLATION MANUAL**

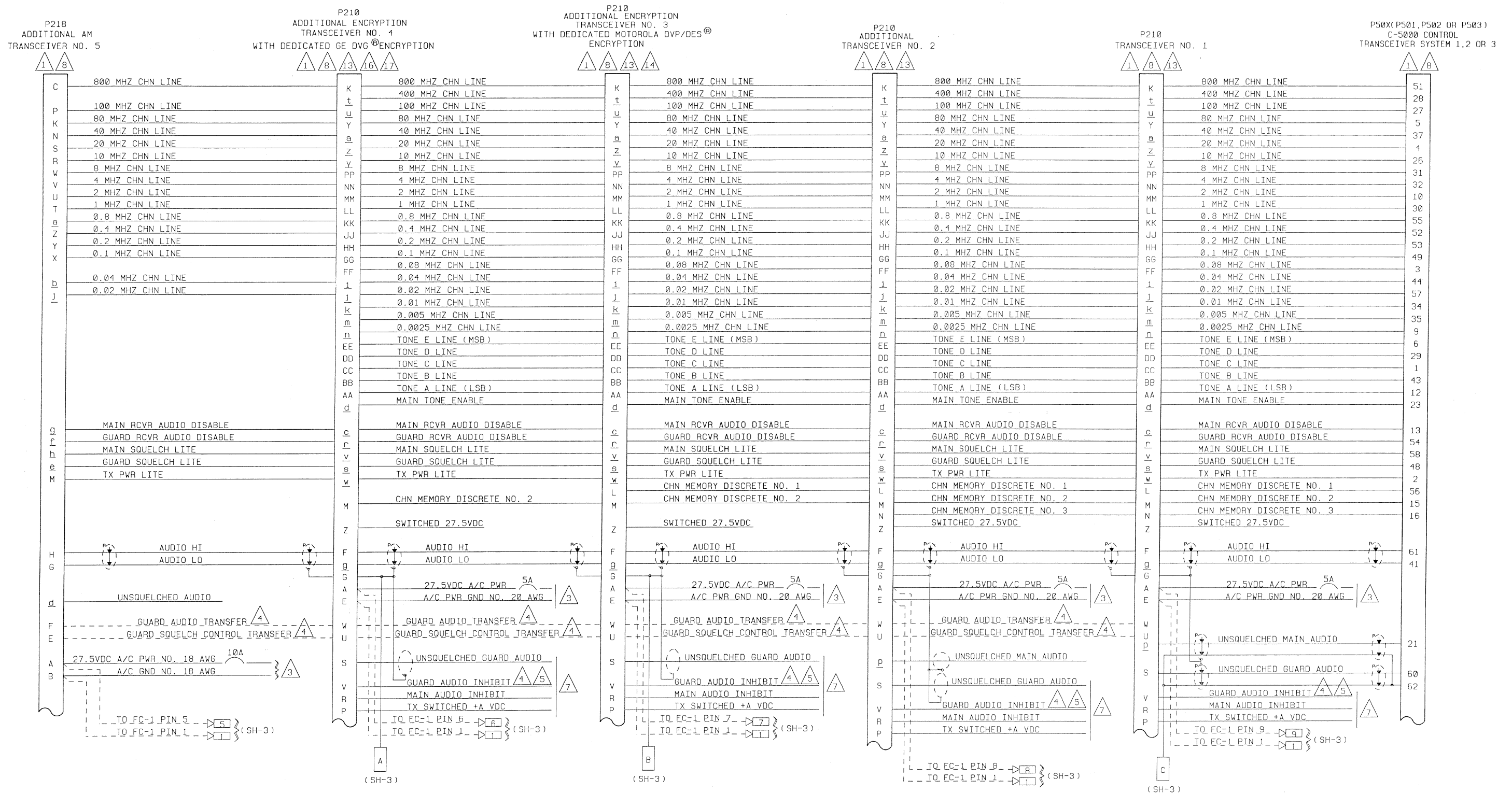


Figure 4-13b. FLEXCOMM I Transceivers Installation Wiring Diagram (Sheet 2 of 5)
RT-30, RT-118, RT-138, RT-138F, RT-450 and RT-406F
(Dwg No 147-014991, Rev B)