



MOTOROLA

ASTRO™ DIU3000
Digital Interface Unit
CENTRACOM Signalling Link



Owner's Manual

68P02949C70-A





MOTOROLA

Land Mobile Products Sector

ASTRO™ DIU3000
Digital Interface Unit
CENTRACOM Signalling Link

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Land Mobile Products Sector

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Owner's Manual

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CENTRACOM SIGNALLING LINK - PERFORMANCE SPECIFICATIONS

DATA TRANSFER (TRANSPARENT DATA TRANSFER FROM CONSOLE TO SUSCRIBER AND VICE VERSA)

In ASTRO Digital Mode

Signalling Data (Embedded into Voice by the DIU, e.g., PTT
ID, Voice Selective Calling, Emergency)

Stand-alone Supplementary data (e.g., Radio-check, Selective
Radio Inhibit, Emergency)

INTERFACE

Type

RS-232, 9600 baud, asynchronous

Specifications are subject to change without notice.

MODEL COMPLEMENT

FLN8255A

DIU3000 Communications Board (COMM2)

FKN4632A

DIU3000 Communications Adaptor cable

68P02949C70

*ASTRO DIU3000 Digital Interface Unit CENTRACOM Signalling Link Owner's manual (this
manual)*

MODEL OPTION

C823AA

Communication Quad Connector

RELATED MANUALS

68P02949C65

DIU3000, Owner's Manual

68P02924C15

ASTRO DIU RSS, User's Manual

68P02949C75

DIU3000, Service Manual

68P81090E45

Encryption Cartridge, User Manual (Models T5371, T5373, T5375)

68P81090E50

Encryption Cartridge, User Manual (All Models)

68P81090E85

Encryption Cartridge, Service Manual (Models T5371, T5373, T5375)

68P81090E95

Encryption Cartridge, Service Manual (All Models)

68P02949C95

DIU3000 Trunking Operation Option, Owner's Manual

Description

Scope of Manual

This manual provides instructions for installation, operation and servicing the CENTRACOM Signalling Link of the DIU3000. For a complete description of the DIU3000 refer to the *DIU3000 Owner's manual 68P02949C65*. In addition, for the customer convenience, this manual covers all other aspects concerning the connection of the CENTRACOM console to the DIU3000, even if they are already covered in other DIU3000 manuals.

General Description

DIU3000

The ASTRO DIU3000 interfaces analog control equipment to the ASTRO base station/comparator. The ASTRO DIU3000 can work with any TRC console, e.g. T5600 or CENTRACOM Series II Plus. This operation is straightforward, and is described in the above mentioned *DIU3000 Owner's manual*.

CENTRACOM Signalling Link

This section describes the connection of the DIU3000 to a CENTRACOM Series II Plus console, that is provided with the ASTRO Console Interface Module (ACIM) interface, model BLN7025A. The connection between the ACIM and the DIU3000 is a serial link, referred to as the CENTRACOM Signalling Link. This enhancement of the CENTRACOM Series II Plus console, allows the transfer of the ASTRO digital information to and from the DIU3000, thus enabling system features that are not available with a regular TRC console. The features supported are: Radio Check, Selective Radio Inhibit, Status Request, Emergency Alarm Ack, Smart Status Ack, etc. Refer to the manual 68P81127E52 for a description of the ACIM module.

From ASTRO 1.7 and up, the Signalling Link allows digital keying instead of TRC console keying only.

The following equipment is required for connecting the hardware indications to the CENTRACOM:

- DB-25 male connector supplied with the DIU3000 in the standard kit FLN6858A, or
- DIU3000 Junction Box, option C62AB (purchased separately).

Functional Description

General

The DIU3000 operation with a TRC console is described in the *DIU3000 Owner's manual*. The TRC functions include the channel selection, key selection, key-up in clear analog/digital mode or secure digital mode, and other base control functions.

The CENTRACOM Signalling Link option allows the DIU3000 to be connected to the CENTRACOM ACIM module via a digital serial link. This digital link allows the transfer of ASTRO digital information from the console to the DIU3000 and vice-versa, thus enabling system features that are not available with a regular TRC console. The following sections describe the serial link functions.

The Signalling Link allows the digital keying console to key up the Base Station using a digital frame instead of the TRC.

Console Transmission

Voice Transmission

As already mentioned above, the console transmission is either TRC or digital keying controlled. Upon key-up, the console passes system information, such as the source ID, destination ID and Talk Group ID, to the DIU3000 via the serial link. In the absence of the serial link between the DIU3000 and the ACIM, the DIU3000 uses its default values for these IDs. By using the serial link, higher system flexibility is achieved. The DIU3000 "embeds" this system information into the digitized voice and transmits it to the subscriber radio through the base station/comparator.

Console transmission can also be controlled by a digital keying console. In this case, the console uses the digital ACIM path to send commands such as "key up the Base Station" to the DIU3000. The protocol on this interface supports all the same functionality as supported by the TRC. This operation is required for SmartNet trunking system configurations and is optional for Conventional system configurations. Digital keying reduces the console key up time, eliminates the console dependency on the limited number of tones allowed in its tone tables and is a more appropriate keying method for a digital radio system.

Data Transmission

The serial link between the DIU3000 and the CENTRACOM ACIM allows stand-alone data to be transmitted from the console to the subscribers (stand-alone data is data sent without voice). The console transmits STAT-ALERT data to the DIU3000 over the CENTRACOM Signalling link, and the DIU3000 transfers the data to the base station/comparator in the format required by the ASTRO protocol.

Among the STAT-ALERT functions supported by the console are: Radio Check, Selective Radio Inhibit, Status Request, Emergency Alarm Ack, Smart Status Ack, etc.



Note

For a description of the the STAT-ALERT functions, the reader can refer to the following documents: "CENTRACOM Series II Plus Control Centers" System Planner R4-2-73B and "STAT-ALERT Digital Communications Systems" System Planner R4-2-88. (The document R4-2-88 describes only part of the STAT-ALERT functions).

Console Reception

Voice Reception

Upon reception of voice, the DIU3000 separates the data "embedded" in voice and passes all the data that accompanied the voice via the CENTRACOM Signalling link to the console. The data is transferred to the ACIM in the format required by the ACIM - DIU3000 link protocol. The data transferred by the DIU3000 to the ACIM includes: subscriber ID, Talk Group ID, encryption key. The DIU3000 also transfers to the ACIM all the ASTRO infrastructure messages received from the base station/comparator, such as the start/stop reception, reception mode, intercom, etc.

Data Reception

The DIU3000 converts the stand-alone data sent by the subscriber into the format required by the CENTRACOM Signalling link protocol, and transfers the data to the ACIM. The STAT-ALERT functions that can be received from the subscriber are the Emergency Alarm, Smart Status, Selective Radio Inhibit Ack, Generic Ack, etc. In addition to the STAT-ALERT messages, the base station/comparator can send to the DIU3000 information regarding the received signal quality, and the DIU3000 passes it to the console.

Operation Modes

The CENTRACOM console supports two modes of operation - Mode 1 and Mode 2. The five configurations supported by the console are as follows:

Table 1
Operation Modes

Mode 1	Mode 2
ASTRO-Clear	Analog-Clear
ASTRO-Coded	ASTRO-Clear
ASTRO-Coded	Analog-Clear
ASTRO-Clear	Undefined
Analog-Clear	Undefined

For a description of these modes of operation, refer to the document "CENTRACOM Series II Plus Control Centers" System Planner, R4-2-73B.

The DIU3000 can be configured for one of these modes of operation by using the RSS, as described in "Programming the DIU3000 (for operation with the CENTRACOM Signalling Link)" section on page 8.

Digital keying consoles support three modes of operation. The mode information is contained in the key up message to the DIU3000 so the mode is no longer dependent on one logic line indicator.

Hardware Indications

The DIU3000 provides two hardware indications to the CENTRACOM console, as follows:

- **Receiver Unsquench.** An active Receiver Unsquench indication from the DIU3000 informs the console that a voice reception is in progress. This happens when the base station receiver unsquench for voice. The DIU3000 reverses the indication (sets it as not active) when the base station receiver squenches back.
- **Mode 1 Indication.** An active Mode 1 indication from the DIU3000 informs the console that a Mode 1 reception is in progress. The operation modes (Mode 1 and Mode 2) are defined the same in the DIU3000 and in the console, to one of the five configurations shown in "Operation Modes" section on page 3. The Mode 1 indication is used by the console for its "Cross-Mode Alert" function (refer to the document "*CENTRACOM Series II Plus Control Centers System Planner*, R4-2-73B).

The DIU3000 provides the two indications as either high (13-15V) or low (0-0.5V) voltage level. The active polarity is RSS defined, as shown in "Programming the DIU3000 (for operation with the CENTRACOM Signalling Link)" section on page 8. The CENTRACOM console has to be configured for the hardware indications as described in the ACIM manual.

Installation

General

This chapter provides the CENTRACOM Signalling Link installation and setup instructions. It is suggested to perform the instructions sequentially. The following are the general steps:

- Electrical connections
- Programming the DIU3000 for operation with CENTRACOM
- Testing the Installation

Electrical Connections

(see Figure 1).

This section contains instructions for connecting the CENTRACOM console to the DIU3000. For your convenience, the instructions for connecting the analog link and the hardware indications to CENTRACOM are provided here, as well, in addition to their coverage by the *DIU3000 Owner's manual*.



Note

The installation of the ACIM in the CENTRACOM console is described in the *ACIM manual* 68P81127E52.

Analog Link Connection



Notes

The analog console should be configured for **four-wire** operation.

The DIU3000 and the base station/comparator should be interconnected by either a four-wire private line or a 3002 channel with C5 conditioning.

Step 1. Connect the two wire-lines between the T/R terminals of the CONSOLE TB on the DIU3000 rear panel to the T connector on the analog console.

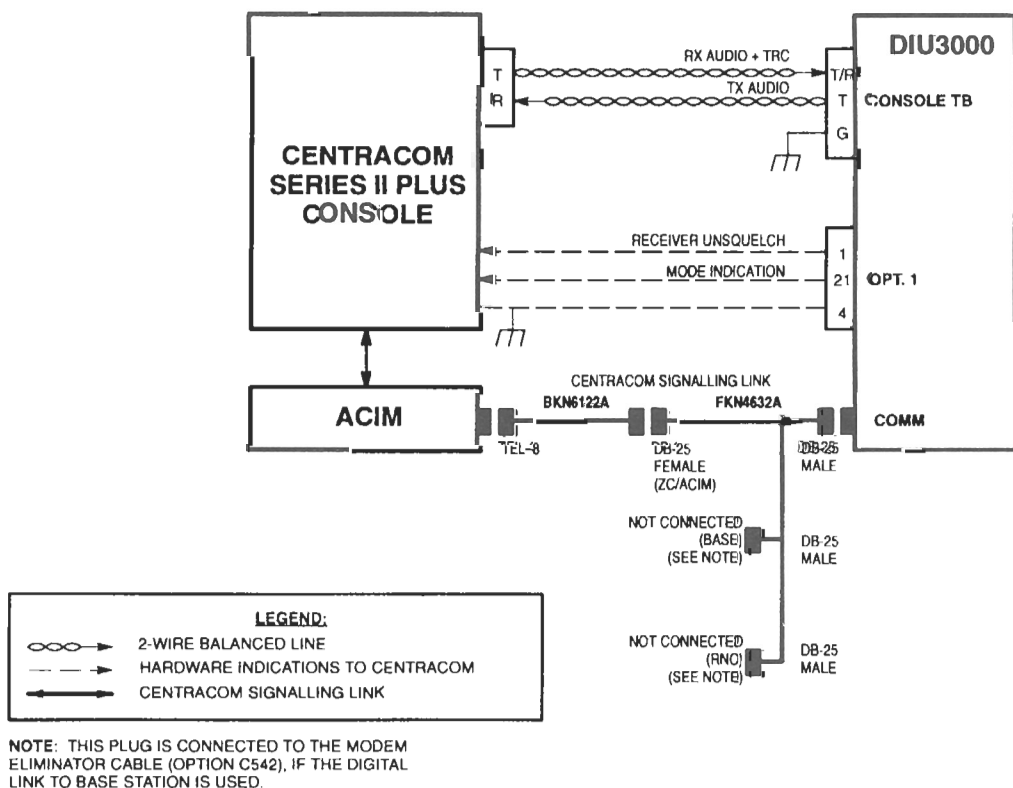


Figure 1
DIU3000 Connection to a CENTRACOM Series II Console

- Step 2.** Connect two wire-lines between the T terminals of the CONSOLE TB on the DIU3000 rear panel to the R connector on the analog console.



Note

It is recommended to use rigid wires for connection to the TB. In most cases, soldering the wire tip is a good practice.

Connecting the Hardware Indications to CENTRACOM

The connection of the hardware indications to the CENTRACOM console should only be indoors. The recommended length of these lines is 1000 feet. The connector type is DB-25 female.



Notes

The wires for connecting hardware indications should be supplied by the customer, according to the specific installation requirements.

The standard DB-25 connector does not fit into the DIU3000 "OPT.1" connector. Use the DB-25 connector supplied in kit FLN6858A.

- Step 1.** If the Junction Box is used, skip this step.
Prepare the cable to be used for the hardware indication signal connections by soldering three wires to pins 1, 4 and 21 of the DB-25 male connector.
- Step 2.** Connect the DB-25 male connector of the Hardware indications cable, prepared in the previous step, or the Junction Box flat cable to the OPT.1 connector on the DIU3000 rear panel.
- Step 3.** Connect pin 4 (Ground) of the DB-25 connector or TB4-3 on the Junction Box (if installed) to the CENTRACOM console ground. (Refer also to the ACIM manual 68P81127E52).
- Step 4.** Connect pin 1 (RECEIVER UNSQUELCH) of the DB-25 connector or TB4-2 on the Junction Box (if installed) to the corresponding pin on the CENTRACOM console Punch block.
- Step 5.** Connect pin 21 (MODE INDICATION) of the DB-25 connector or TB4-1 on the Junction Box (if installed) to the corresponding pin on the CENTRACOM console Punch block.

Connecting the CENTRACOM Signalling Link

Connect the DIU QUAD ZC/ACIM RJ45 connector (connector #3) to the ACIM. Refer to Table 4 for connector pin-outs, and refer to Table 5 for ACIM jumper settings.

Programming the DIU3000 (for operation with the CENTRACOM Signalling Link)

Programming Instructions

This section describes the parameters specifically for the DIU3000 to CENTRACOM console Signalling link. The steps to be followed are given starting from the Main Menu. For a description of the complete DIU3000 programming, refer to the DIU3000 RSS manual 68P02924C15.

Enabling the option:

- Step 1.** Access in the CHANGE/VIEW : ASTRO System Parameters screen (see Figure 2).
- Step 2.** Set the CENTRACOM Signalling Link parameter to ENABLE.

MOTOROLA Radio Service Software ASTRO Digital Interface Unit		Use Up/Down Arrows To Change Value
MAIN:CHANGE/VIEW:ASTRO SYSTEM		
ASTRO SYSTEM		
Encrypted System	ENABLE	[ENABLE / DISABLE]
Analog Mode Support	ENABLE	[ENABLE / DISABLE]
CENTRACOM Signalling Link	ENABLE	[ENABLE / DISABLE]
RNC Link	DISABLE	[ENABLE / DISABLE]
Data & OTAR Support	DISABLE	[DISABLE / DATA ONLY / DATA & OTAR]
Analog Console	TRC	[TRC / E&M / DISABLE]
Handset User	ENABLE	[ENABLE / DISABLE]
MRII Phone Patch	DISABLE	[ENABLE / DISABLE]
ASTRO Trunking System	DISABLE	[SMIZN / SMINT / DISABLE]
F1 HELP	F2	F3
F4	F5 PRINT SCREEN	F6
F7	F8	F9
F10 EXIT		

Figure 2
ASTRO System Parameters Screen

Verifying the modified configuration:

- Step 3.** Access the SERVICE : DIU Configuration : Hardware Configuration screen (see Figure 3).
- Step 4.** Verify that the hardware configuration is modified accordingly (i.e., the Communications Board appears as "Needed"). The information in the "Installed" and "Version" columns is updated only if the codeplug is read from the DIU3000 and not from a file.

MOTOROLA Radio Service Software ASTRO Digital Interface Unit		This Screen Includes READ-ONLY Parameters	
MAIN:SERVICE:DIU-CONFIG:HW-CONFIG			
HARDWARE CONFIGURATION			
P.C.B	Needed	Installed	Version
EMC Module	YES	YES	b
EMC Adaptor	YES	YES	a
Base Station Wireline	YES	YES	b
Modem Board	NO	YES	N/A
Console Wireline	YES	YES	b
Communication Board	YES	YES	e
Operator	YES	YES	e
GPIO Board	YES	YES	b
Basic Board	YES	YES	c
Memory Board	YES	YES	a
DSP Board	YES	YES	a
F1 HELP	F2	F3	F4
	F5 PRINT SCREEN	F6	F7
		F8	F9
			F10 EXIT

Figure 3
Hardware Configuration Screen

Setting the Talk Group ID Time Out:

Step 5. Access the CHANGE/VIEW : Tx Default Attributes : Digital, TRC, SN Console Default Attributes screen (see Figure 4).

MOTOROLA Radio Service Software ASTRO Digital Interface Unit		Use Up/Down Arrows For Available Values or Type In The Desired Value	
MAIN:CHANGE/VIEW:TX:TRC			
Digital, TRC, SN CONSOLE DEFAULT TX ATTRIBUTES			
Self ID	5	[1-9999999]	
Talk Group ID	4095	[0-65535]	
Talk Group ID Time Out	200	[0-10000 mSec]	
Channel <Blanks for Don't Care>		[0-255 Decimal or Spaces]	
Tx Mode	CLEAR	[ANALOG/CODED/CLEAR]	
Default/Failsoft Key Number <Blanks for Don't Care>		[0-511]	
F1 HELP	F2	F3	F4
	F5 PRINT SCREEN	F6	F7
		F8	F9
			F10 EXIT

Figure 4
Digital, TRC, SN CONSOLE DEFAULT TX ATTRIBUTES Screen

Step 6. Set the Talk Group ID Time Out parameter value.



Note

This parameter sets the time the DIU3000 waits for the console to send the information required for the transmission, i.e. Talk Group ID and Source ID. The parameter range is 0–10 seconds, with a step of 10 milliseconds. The recommended value is 200 milliseconds.

Setting the polarity of the Hardware indications and the Mode1/Mode2 Configuration:



Note

The Receiver Unsilence to CENTRACOM, Mode1 Indication and the Mode 1/Mode 2 Configuration parameters are described in detail in the *DIU3000 RSS User's manual*. The hardware indication signals can be used by any DIU3000 connected to a CENTRACOM console, regardless whether the signalling link option is used or not.

Step 7. Access the CHANGE/VIEW : CONS&MICS : TRC Console : Console Interfaces screen (see Figure 5).

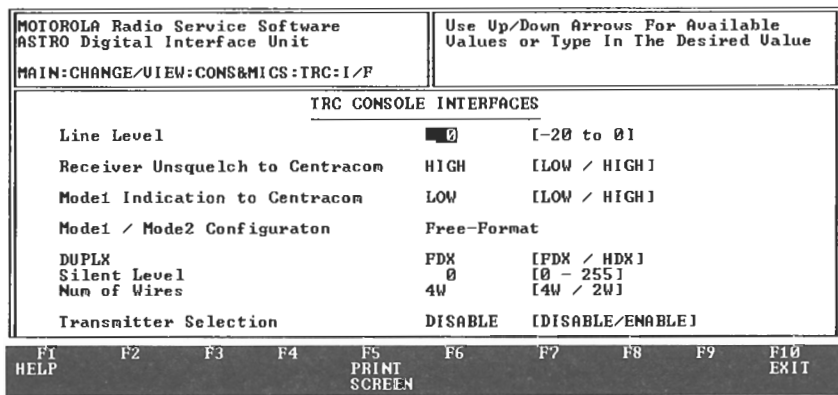


Figure 5
TRC Console Interfaces Screen

Step 8. Set the Receiver Unsilence and Mode1 Indication parameters as required.



Note

By default, both are set to LOW and usually should be left as is. Only in special console configurations it may be necessary to reverse the polarity.

Step 9. Set the Mode1/Mode2 Configuration parameter as required (see Figure 6).



Note

The default value for the Mode1/Mode2 Configuration parameter is Free-Format. This means that the user can define the mode related to any TRC sequence as being analog, ASTRO Clear or ASTRO encrypted. The Mode1/Mode2 Configuration parameter of a DIU3000 working with a CENTRACOM has to be programmed according to the Mode1/Mode2 configuration in the CENTRACOM.

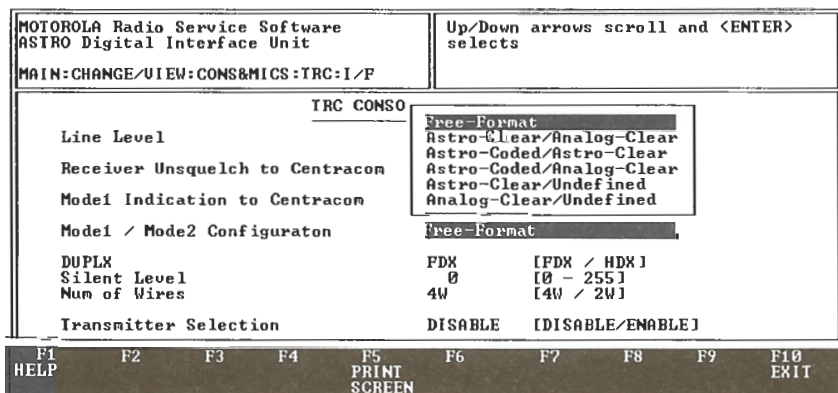


Figure 6
Mode 1 / Mode 2 Configuration Choice List - Pop-Up Window

Setting the auto mode:

The auto mode parameter is used with DIUs connected to any console, with or without a signalling link. For a detailed description of the auto mode, refer to the *DIU3000 RSS User's Guide 68P02924C15* and to the *"CENTRACOM Series II Plus Control Centers" System Planner R4-2-73B*.

For proper operation of the CENTRACOM console in a secure system, it is necessary to assign one of the console buttons as the "AUT Mode" select tone. In addition, it is necessary to create a corresponding Function Request in the TRC Functionality table of the DIU3000 RSS, such as the one shown in the example below. The dispatcher will use this button to put the DIU3000 into auto mode, whenever it is necessary to use the last received key as the key for the next transmission.

MOTOROLA Radio Service Software ASTRO Digital Interface Unit Page 1 out of 8 MAIN:CHANGE/VIEW:CONS&MICS:TRC:TABLE		Use <?> For Choice List or Type In The Desired Value							
TRC FUNCTIONALITY TABLE									
Tone1	Tone2	Function Assignments							
0	950	0	AUT						
1									
2									
3									
4									
5									
6									
7									
8									
9									
F1 HELP	F2 SAVE TABLE	F3 GET TABLE	F4	F5 PRINT SCREEN	F6	F7 DELETE LINE	F8 CLEAR TABLE	F9 RESET TABLE	F10 EXIT

Figure 7
A Typical Auto Mode Selection Function Request

Parameter Check List

This section contains a check-list of all the parameters that the user has to check/change in order to configure the DIU3000 for the CENTRACOM Signalling Link requirements. The table contains the path in the RSS menu tree leading to the screen that contains the parameter, the parameter default value, and the range of values the parameter can have. If it is necessary to change the parameter value, the user can record the new value in the empty column provided. After all the parameters in the table are checked/changed, the user can proceed to the actual parameters programming, using the DIU RSS computer program. The user can use the last column in the table to mark with a "✓" each parameter already programmed.

Table 2
DIU3000 Parameter Configuration Check List for CENTRACOM Signalling Link

Parameter Path / Name	Default	Range	Required	✓
CHANGE/VIEW : Astro System Parameters				
CENTRACOM Signalling Link	Disable	Enable / Disable	Enable	
Analog Console	TRC	TRC / E&M / Disable	TRC	
ASTRO Trunking System	Disable	SMTZN / SMTNT / Disable	Disable	
CHANGE/VIEW : TX Default Attributes : TRC/SN Console Default TX Attributes				
Talk Group ID Time Out	4095	0 - 65535	*	
CHANGE/VIEW : CONS&MICS : TRC Console : Console Interfaces				
Receiver Unsilence to Centracom	Low	Low / High		
Mode 1 Indication (Centracom)	Low	Low / High		
Mode 1 / Mode 2 Configuration	Free-Format	Free-Format Astro-Clear / Analog-Clear Astro-Coded / Astro-Clear Astro-Coded / Analog-Clear Astro-Clear / Undefined Analog-Clear / Undefined		

*The recommended value for the Talk Group ID Time Out parameter is 200 ms. If the system allows it, the value can be set to less than 200 ms. In very congested systems it may be required to set the parameter to a higher value.

Testing the Installation

The following test can be performed after performing the electrical connections described in "Electrical Connections" section on page 6, and programming both the DIU3000 ("Programming the DIU3000 (for operation with the CENTRACOM Signalling Link)" on page 8) and the Series II Plus console.

Testing the DIU3000 to CENTRACOM link:

- Step 1.** Connect the line power to the DIU3000 and console and wait for the two devices to perform their power-on processes (refer to the ASTRO DIU3000 Owner's manual, "DIU3000 Power-on" section on page 28, for the description of the DIU3000 power-on process).
- Step 2.** Check that the green LED on the ACIM board is lit.
- Step 3.** Disconnect the TEL-8 connector from P6 on the ACIM board and wait for about 12 seconds. Check that the green LED blinks slowly (about 3 seconds on, 3 seconds off).
- Step 4.** Reconnect the TEL-8 connector and check that after several seconds the green LED is steadily lit.

Testing the DIU3000 with loop-back on base station:**Notes**

The test allows checking the DIU3000 functional operation without connecting to the base station.

The test requires the use of a test handset (option C109AA).

Step 5. Perform the following setup (see Figure 8):

- For the V.24 Digital link: Disconnect adaptor cable FKN4632A from the DIU3000 COMM connector. Connect jumper wires between the following pins of the COMM connector: 2 (TD) and 3 (RD), 24 (TCLK) and 17 (RCLK), 4 (RTS), 5 (CTS) and 8 (CD). Connect jumper wires between the T/R and R terminals of the STATION connector.

The fact that now the digital link between the DIU3000 and the console is disconnected (the ACIM green LED is blinking) does not affect this test.

- For the Modem analog link (option X437AF): Connect jumper wires between the T/R and R terminals of the STATION connector.

Step 6. Use the DIU3000 handset to speak and monitor your own voice (with some delay). Only if the DIU3000 circuits function properly, will you hear your voice through the handset earpiece. You can perform the test in all modes of operation.

Step 7. Use the analog console handset in full duplex mode to speak and monitor your own voice (with some delay). Only if the DIU3000 circuits function properly, will you hear your voice through the handset earpiece. You can perform the test in all modes of operation.

Step 8. Disconnect the setup made in step 5. Reconnect adaptor cable FKN4632A to the DIU3000 COMM connector.

Testing the DIU3000 basic key-up operation:

Step 9. Key up the console in Mode 1 and check that the DIU3000 TX LED is on as long as the console is keyed up, and that talking in the console microphone is heard in the DIU3000 handset.

Step 10. Repeat step 9 with the console in Mode 2.

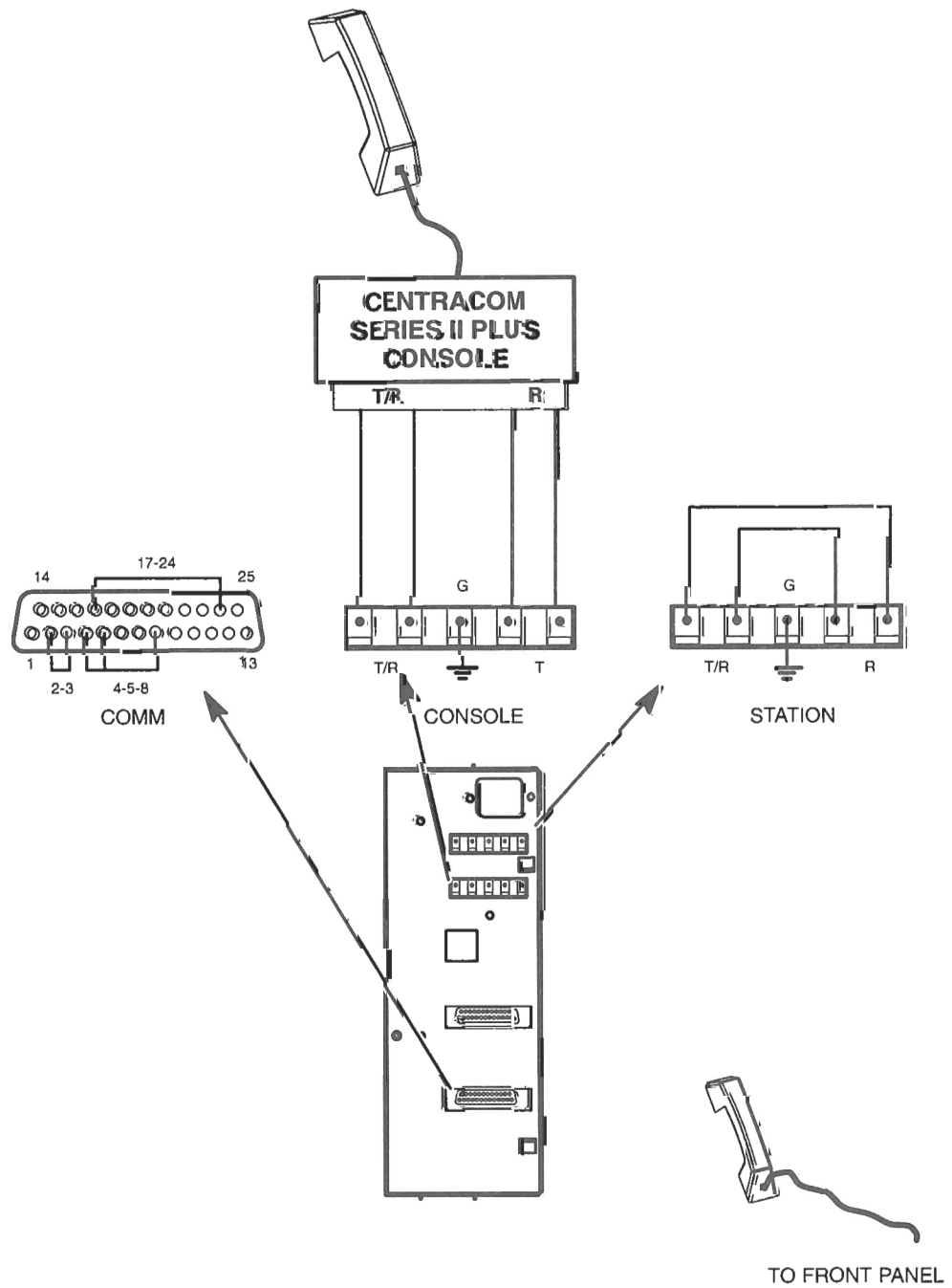


Figure 8
Testing the DIU3000 with Loop-Back on Base Station

Troubleshooting

General

This chapter provides instructions for troubleshooting the CENTRACOM Signalling Link only. For the DIU3000 troubleshooting, refer to the *DIU3000 Owner's Manual*. For the CENTRACOM ACIM troubleshooting, refer to the *ACIM manual*.

Troubleshooting Instructions

The user can be helped in troubleshooting the DIU3000–console digital link, by first performing the Installation testing procedure given in “Testing the Installation” on page 12.

Problem / Indication	Possible Cause	Remedy
ACIM green LED blink slowly.	1. One of the FKN4632A or BKN6122A cables is defective	Check the cables and replace or repair the defective one.
	2. DIU3000 Communication board is improperly installed or defective.	Verify that the Communication board is properly installed or replace if defective.
	3. DIU RSS parameter "CENTRACOM Signalling Link" is set to "DISABLE".	Use the DIU RSS to set the parameter to "ENABLE" (see "Programming the DIU3000 (for operation with the CENTRACOM Signalling Link)" section on page 8.
Hardware indications not active	1. DIU3000 GPIO board is improperly installed or defective.	Verify that the GPIO board is properly installed or replace if defective.
	2. Mode1/Mode2 definitions in DIU3000 and console do not match.	Check Mode1/Mode2 definitions in DIU3000 and console.
	3. Console not configured correctly.	Check console configuration (see ACIM manual).
Subscriber receives the DIU3000 default IDs.	Talk Group ID time-out in DIU3000 left as default (0) or set too low.	Use DIU RSS to set Talk Group ID time-out to 200 msec.
Console cannot answer encrypted calls.	Auto mode not set correctly.	Use DIU RSS to check if the auto mode is correctly set for the console TRC sequence.

Appendix A: Connectors and Cables

Table 3
COMM Connector Pin Description FKN4632A (W cable)

Pin No.	Signal Name	Description	I/O Type
1	Prot. GND	Protective Ground	
2	TD	Transmit data to Base Station	digital output
3	RD	Receive data from Base Station	digital input
4	RTS	Request to Send to Base Station	digital output
5	CTS	Clear to Send from Base Station	digital input
6	TCLK"	External Tx clock for RNC	digital output
7	GND	Ground from Base Station	
8	CD	Carrier Detect from Base Station	digital input
9	RD'	Receive Data from CENTRACOM or Zone Controller	digital input
10	TD'	Transmit Data to CENTRACOM or Zone Controller	digital output
11	RTS"	Request to Send to RNC	digital output
12	TD"	Transmit data to RNC	digital output
13		Not used	
14		Not used	
15	CD"	Carrier Detect from RNC	digital input
16	RCLK"	Receive Clock from RNC	digital input
17	RCLK	Receive Clock from Base Station	digital input
18	CTS"	Clear to Send from RNC	digital input
19	RD"	Receive data from RNC	digital input
20		Not used	
21		Not used	
22	GND"	Ground from RNC	
23	GND"	Ground from CENTRACOM or Zone Controller	
24	TCLK	Internal Tx Clock for Base Station	digital output
25		Not used	

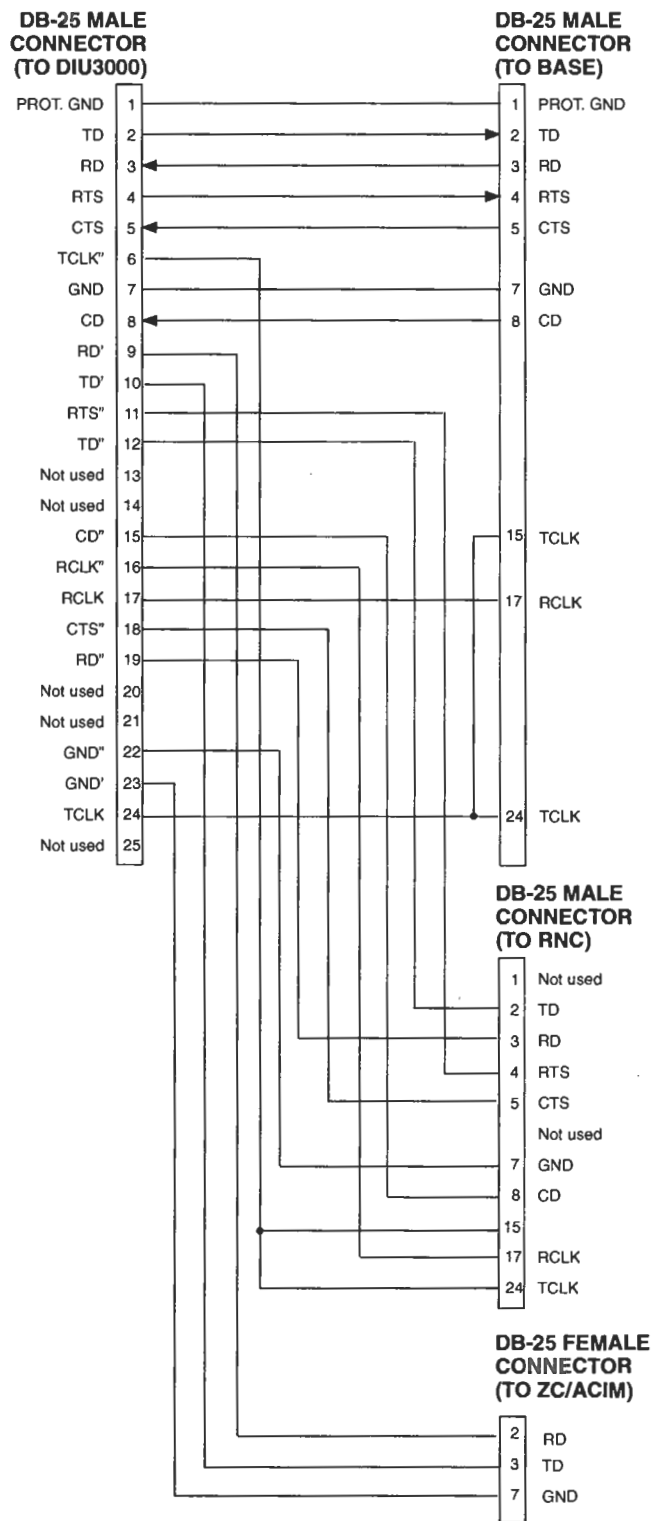


Figure 9
DIU3000 Communication Adaptor Cable FKN4632A (W cable)

Table 4
Quad Connector FLN5462A Pin Description

Function	DIU Comm Port DB-25M PIN	V.24 (null) RJ-45 #1	V.24 RJ-45 #2	ACIM/SZ RJ-45 #3	RNC RJ-45 #4
PROT. GND	1				
TD	2	5	6		
RD	3	6	5		
RTS	4	2	8		
CTS	Jmpr #4 DB25-5 to DB25-4 & DB25-5 to Jmpr #6-1		7		
TCLK"	6				1
SIG GND	7	4	4		
CD	DB25-8 to Jmpr #6-2	RJ#1-8 to Jmpr #6-3	RJ#2-2 to Jmpr #6-3		
RD'	9			Jmpr #2 DB25-9 to RJ#3-3 & DB25-9 to RJ#3-4	
TD'	10			Jmpr #2 DB25-10 to RJ#3-2 & DB25- 10 to RJ#3-6	
RTS"	11				6
TD"	12				2
Not used	13				
Not used	14				
CD"	Jmpr #5 DB25- 15 to DB25-11				
RCLK"	16				3
RCLK"	17	3	1		
CTS"	18				7
RD"	19				5
Not used	20				
Not used	21				
GND"	22				4
GND"	23			Jmpr #1 DB25-23 to RJ#3-7 & DB25- 23 to RJ#3-8	
TCLK	24	1	3		
Not used	25				

Table 5
Quad Connector FLN5462A Jumpers

Jumper	Application	Jumper Table	Standard Jumper Installation
1*	ACIM Position	23 & 8	Default
	SZ Position	23 & 7	
2*	ACIM Position	9 & 4	Default
	SZ Position	9 & 3	
3*	ACIM Position	10 & 6	Default
	SZ Position	10 & 2	
4	V.24 and Null	4 & 5	Default
	Open Connection	5 & N/C	
5	RNC	11 & 15	Default
	Open Connection	15 to N/C	
6	Internal CD	8 & 5	Default
	External CD	8 & 8/2	

*.Jumpers 1, 2, and 3 must be all in the ACIM position or SZ position.

Appendix B: Acronyms

ACIM	ASTRO Console Interface Module
CEB	Central Electronics Bank (CENTRACOM Series II)
DCCM	Display Channel Control Module
DIU	Digital Interface Unit
DRC	Digital Remote Control
DSP	Digital Signal Processing
EMC	Encryption Module Cartridge
FDMA	Frequency Division Multiple Access
FIPS	Federal Information Processing Standards
FREQ	Function Request
FT	Function Tone
HLGT	High Level Guard Tone
KMC	Key Management Controller
KVL	Key Variable Loader
LLGT	Low Level Guard Tone
RSS	Radio Service Software
TRC	Tone Remote Control