Engineer: RBP/CTS	Date: 12/5/03	**Raytheon**				
Drawn: RBP	Date: 12/5/03	**JPS Communications** 5800 Departure Drive, Raleigh, NC 27616				
Approved: CTS	Date: 2/13/04	Title: ACU RADIO APPLICATION NOTES				
Issued/ Revised	Date: 3/25/04	Size: A	Dwg. #: **5961-271251-APP**	Rev: **A**	Sheet: 1 Of 7	

APPLIES TO: Mitsubishi Mobile Satellite ST211 (Radio only)
Mitsubishi Mobile Satellite ST221 (Radio only)
Mitsubishi Mobile Satellite ST251 (Radio only)

RADIO MODIFICATIONS: None required.

RADIO PROGRAMMING:

1. See Mitsubishi Series ST200 Satellite Terminal Operating & Commissioning Guideincluded in this document.

RADIO CONTROLS: Not applicable.

CABLING:

Standard ACU-1000 and ACU-T Interface cables are made up of a 2 foot TRP Radio Tray Interface cable and the appropriate 13-foot Extension cable.

ACU-1000 Interface Cable	JPS P/N 5961-291251	(5961-271251 + 5961-261002-00)
ACU-T Interface Cable	JPS P/N 5961-281251	(5961-271251 + 5961-281013-00)
TRP-1000 Shelf Interface Cable	JPS P/N 5961-271251	
Radio RF Connector Type	Proprietary connector to active antenna	

DSP PROGRAMMING:

RX Level	3*	0dBm*	
TX Level	6*	0dBm*	
Squelch Type	VOX*		
COR Polarity	Active Low*		
High Frequency Equalizer	4*	Flat*	
RX Audio Delay	2*	100 ms*	
TX Audio Delay (Radio Type)	4	800ms	See notes
Noise Reduction Value	0*	Off*	
VOX/VMR Threshold	1*	Med1*	
VOX/VMR Hang Time	3*	775 ms*	
COR Inhibit After PTT	1*	100 ms*	
All Others	As needed		

(* Indicates Default Value)

NOTES:

Channel acquisition for sat-com radios can take as much as 2.4 seconds. This could result in initial syllables of transmit audio being lost during channel acquisition. An equivalent delay in the TX audio path requires use of an AP-1 (TX Option) module to provide a further 1.6 seconds of delay in addition to the 800 ms provided by the DSP-1 module.

271251-APP.doc

Mitsubishi Series ST200 Satellite Terminal
Operating & Commissioning Guide

These notes were written by JPS Engineering as an assist to operating and commissioning the unit because of the lack of information available about the Mitsubishi Satellite Terminal. If you experience problems with the commissioning process please call 1-800-550-5811 and a Mitsubishi Customer Service Representative will be available to help you.

1.0 Operation Guide

The Mitsubishi series ST200 Satellite terminal works with the ACU-1000's DSP-1 settings all set to factory defaults. However, since channel acquisition for the Sat-com radio can take approximately 2.4 seconds, it's a good idea to put an equivalent delay in the TX Audio path. This delays the audio sent to the Sat-com so that initial syllables aren't lost during the channel acquisition time. The DSP-1 module wired to the satellite terminal can be set to add 800 mS TX Audio delay. An AP-1 (TX Option) can add up to 1.6 seconds of delay on top of the 800 mS provided by the DSP-1.

STEP 1:
Connect the Dome Antenna to the Mitsubishi Series ST200 terminal.

STEP 2:
Turn the power on using either the phone handset or the PTT microphone.

STEP 3:
Press any key on the PTT microphone to get control of the unit with the PTT microphone.

STEP 4:
Using the PTT microphone press the **GRP** button followed by the number of the group wanted.

STEP5:
Use the PTT microphone to talk to the party on the other end of the link. This establishes a good Sat-com link before interconnecting the Sat-com with the rest of the ACU-1000 system.

STEP6:
Cross-connect the DSP-1 associated with the Mitsubishi Sat-com with another DSP-1 and/or to the HSP-2.

STEP7:
The Mitsubishi Sat-com terminal is now interconnected with the ACU-1000.

2.0   Commissioning Guide

Mitsubishi Series ST200 Satellite Terminal with SZ300A Push to Talk Microphone

The Satellite Terminal was commissioned when it was installed in the TRP-1000. The following steps are needed only if the system must be re-commissioned.

The satellite terminal mounted in the TRP-1000 is connected to a junction box which has the 'Y' cable used to interface the system to the ACU-1000. The satellite terminal uses a (BSU) Beam Steering Unit.   The unit is installed with both the telephone handset/keypad and the PTT Microphone/keypad. The power may be turned on with either the telephone handset/keypad or the PTT Microphone/keypad. In order to use the terminal as a two-way radio, the user will need to put the PTT Microphone/keypad in control of the unit. Pressing any key on the PTT Microphone/keypad will allow the user to input information using the PTT Mic. The following steps are needed to initially set up the unit (called "Commissioning" the unit).

- Press the power button and wait three seconds for the system to finish the wake up cycle.
- Press and HOLD the **CLR** key and input the number 8761015
  - NOTE: The wakeup period takes approximately 3 seconds, the user then has seven seconds to enter the code while holding the **CLR** button. This code is only valid for 20 programming attempts. After 20 attempts, a new code is required.
  - Press the **CLR** button
  - At this time the display should show [min000 0000000]. This is when you should enter the MSAT phone number
  - Press the **SEND** button
  - Enter 4-digit security code {0000}
  - Press the **SEND** button
  - At this time delete the 911 that appears in the display and enter {000} (Eng. No)
  - Press the **SEND** button
  - Enter the AU type as {03 for Omni-quest}
  - Press the **SEND** button
  - A 20 digit SASK code is assigned by the unit (see note at end of this section)
  - Press the **SEND** button
  - Press the **STO/END** button.
  - The unit will now power down.
  - Re-power the unit.
  - Press Clear **CLR** and then Function **FCN** then {9} then {4}
  - The display will show PFC/CFC
  - Press **FCN**, then {9}, then {4}
  - The display will show Auto-Com OFF
  - Press the {**#**} key to turn Auto-Com ON
  - Press the **STO/END** button
  - Press the **FCN** key, then {9}, then {3}
  - The display will show PFC/CFC
  - Press 1
  - The display will read PFC=
  - Enter the Pilot Frequency (for NC = 1553600000)

- Press the **STO/END** button
- The display will read CFC=
- Enter the Comm Frequency (for NC =1553609000)
- Press the **STO/END** button
- The display will show To SRCH push SND"
- Press the **SEND** key, hold for ½ second
- The display will read BnnSMM
                           OK*/NG#
                           PWR NO SCV
- The display will update to BOOS24
                              OK*/NG#
                               PWR NO SCV
- The display will show SAT SEARCH
- The display will show B01S00E
                           M: GC-S
- The display will update to SAT –Signal Strength- -ON-

- Commissioning of the unit is now complete

See Commissioning Guide from Mitsubishi on following pages. JPS was unable to commission the unit when following this guide and instead used the procedure detailed above.

The Mitsubishi guide includes a toll-free Customer Service number.

Mitsubishi Commissioning Guide

If commissioning a transportable unit, verify that the battery is charged or optional AC adapter is connected. Turn on the main power located on the face plate of the briefcase. If installing in a vehicle with a dome antenna, ensure that the vehicle is running and that the Beam Stirring Unit (BSU) is pointing upwards.

Press Power and wait 3 seconds (for wake up cycle to finish)

Press and **hold** CLR key and input **8761015**

The wake up period is about 3 seconds. You then have 7 seconds to input the above code. The code is only valid for 20 programmings.

Press   **CLR**

If successful the display will read:

MIN 000   Enter assigned MSAT phone #
  0000000

Press   **SEND**

SecCode   Enter 4 digit security code 0000

Press   **SEND**

ENG. No   Delete 911 and enter 000.

Press   **SEND**

AU type   **03 for Omniquest**
        05 for HG transportable
        01 for Dome Antenna
        07 for Fixed site

Press   **SEND**

ASK   20 digit SASK code as assigned

NOTE: MELCO does not require the * every fifth digit

Press   **SEND**

Press   **STO/END**

(handwritten:) COMMISIONING GUIDE SENT BY MITSUBISHI

(handwritten:) THIS GUIDE PROVED TO BE UNRELIABLE

The unit will now power down.

Power up the MT If the unit is not new press CLR and then (FCN) 9 and 4

The display will read: Enter PFC/CFC

Press   Function key (FCN) then9 then 4

The display will read: AutoCom OFF

Press   # to toggle to AutoCom ON

Press   STO/END key

Press   Function key (FCN) then 9 then 3

The display will read: **PFC/CFC press 1**

The display will read: PFC=
Enter the Pilot Frequency.

Press   **STO/END**

The display will read: CFC=
Enter the Comm Frequency.

Press   **STO/END**

The display will read: To SRCH push SND

Press   The **SEND** key for 1/2 second

The display will read: BnnSMM
                              OK*/NG#
                              PWR NO SCV

The display will update to: B00S24
                              OK*/NG#
                              PWR NO SCV

i.e. Translation to: B00 = Beam 00 (East beam)
                      S24 = Signal Strength (0 to 40)

Press   *

The display will read: SAT SEARCH

PWR NO SCV

The display will update: SAT Signal Strength
                                     -ON-
                                PWR NO SCV

When the unit has passed the commissioning process the NO SCV will disappear.

Press   *

And the commissioning process is done.

If you should see: Shut DWN
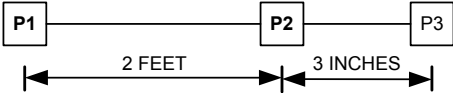   Push PWR
                      PWR NO SCV

Shut down the MT by pressing PWR and restart commissioning

Once the unit is operational dial 611 on your MSAT communicator to receive your directory number.
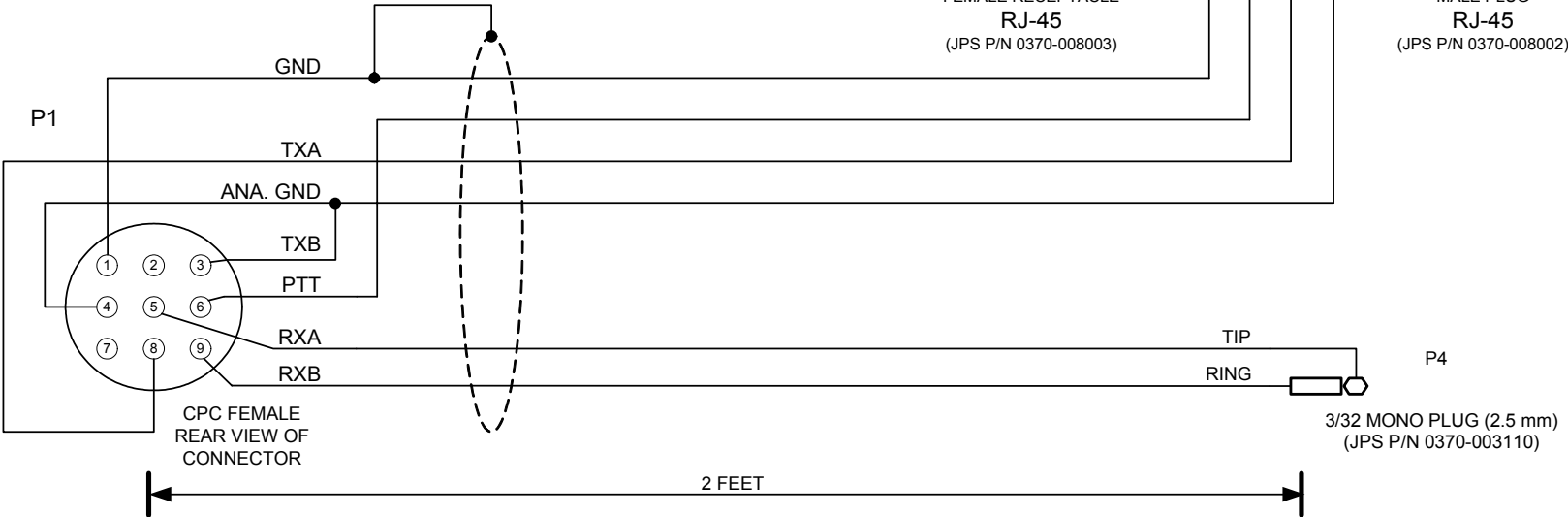
❑   If you experience problems with the commissioning process please call
    1-800-550-5811 and a Customer Service Representative will be available to
    help you.

PURCHASED PART

Rev	ECO	Date
A		

P1 ——— P2 — P3

2 FEET   3 INCHES

USE MOLDED CABLE
(JPS P/N 5961-261003-00)

P2
1
2
3
4
5
6
7
8

FEMALE RECEPTACLE
RJ-45
(JPS P/N 0370-008003)

P3
1
2
3
4
5
6
7
8

MALE PLUG
RJ-45
(JPS P/N 0370-008002)

P1

GND

TXA

ANA. GND

TXB

PTT

RXA

RXB

1 2 3
4 5 6
7 8 9

CPC FEMALE
REAR VIEW OF
CONNECTOR

TIP

RING

P4

3/32 MONO PLUG (2.5 mm)
(JPS P/N 0370-003110)

2 FEET

COMPONENT PCB
(JPS P/N 5961-271000)

JU1
JU2
JU4
JU5

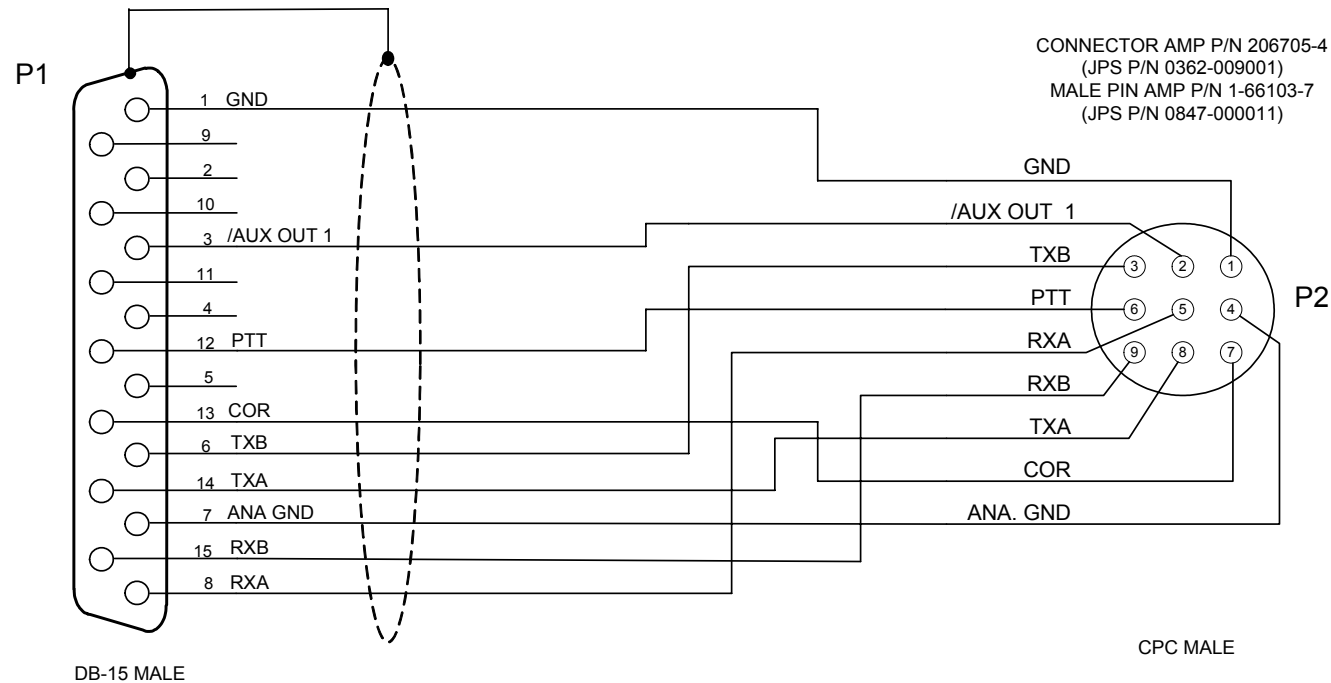NOTE: SHIELD DRAIN CONNECTED TO PIN 1 OF P1 ONLY.

USED WITH:
MITSUBISHI ST211 SATELLITE TRANSCEIVER (RADIO ONLY)
MITSUBISHI ST221 SATELLITE TRANSCEIVER (RADIO ONLY)
MITSUBISHI ST251 SATELLITE TRANSCEIVER (RADIO ONLY)

Designed By:	CTS	**Raytheon** JPS Communications		
		Raleigh, NC USA		
Drawn By:	EDV	Title	CABLE, CPC TO MITSUBISHI ST211	
Checked By:	JAC	Size A	Document Number **5961-271251**	Rev A
		Issued Date	NOVEMBER 5, 2003	Sheet 1 of 1

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PURCHASED PART

Rev	ECO	Date
A		

P1

CONNECTOR AMP P/N 206705-4
(JPS P/N 0362-009001)
MALE PIN AMP P/N 1-66103-7
(JPS P/N 0847-000011)

1 GND
9
2
10
3 /AUX OUT 1
11
4
12 PTT
5
13 COR
6 TXB
14 TXA
7 ANA GND
15 RXB
8 RXA

GND
/AUX OUT 1
TXB
PTT
RXA
RXB
TXA
COR
ANA. GND

P2

(3) (2) (1)
(6) (5) (4)
(9) (8) (7)

DB-15 MALE

CPC MALE

13 FEET

NOTES: 1) USE BELDEN 9934 SHIELDED CABLE.

2) CONNECT SHIELD DRAIN TO SHELL OF P1 ONLY.

3) CONNECTORS P1 AND P2 MUST BE MOLDED TO THE CABLE.

4) CABLE MUST BE LABELED WITH THE RAYTHEON/JPS P/N AND
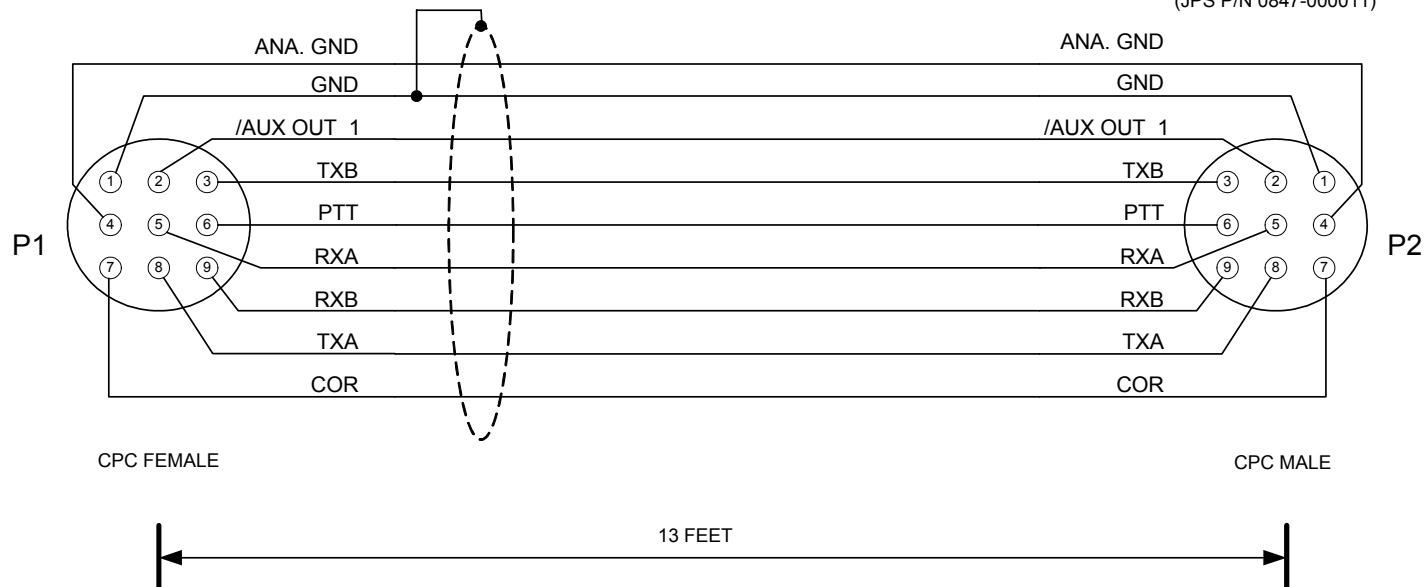REV, VENDOR CODE AND DATE (MM/YY).

Designed By: JAC	**Raytheon JPS Communications**		
Drawn By: JAC	Title CABLE, ACU-1000 RADIO EXTENSION - 13 FT		
Checked By: RBP	Size A	Document Number **5961-261002-00**	Rev A
	Issued Date JANUARY 5, 2004		Sheet _1_ of _1_

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Rev	ECO	Date
A		

PURCHASED PART

CONNECTOR AMP P/N 206708-1
(JPS P/N 0362-005003)
FEMALE PIN AMP P/N 1-66105-8
(JPS P/N 0362-005002)

CONNECTOR AMP P/N 206705-4
(JPS P/N 0362-009001)
MALE PIN AMP P/N 1-66103-7
(JPS P/N 0847-000011)

ANA. GND	ANA. GND
GND	GND
/AUX OUT 1	/AUX OUT 1
TXB	TXB
PTT	PTT
RXA	RXA
RXB	RXB
TXA	TXA
COR	COR

P1

P2

CPC FEMALE

CPC MALE

13 FEET

NOTES: 1) USE BELDEN 9934 SHIELDED CABLE.

2) CONNECT SHIELD DRAIN TO PIN 1 OF P1 ONLY.

3) CONNECTORS P1 AND P2 MUST BE MOLDED TO THE CABLE.

4) CABLE MUST BE LABELED WITH THE RAYTHEON/JPS P/N AND
   REV, VENDOR CODE AND DATE (MM/YY).

Designed By: JAC	**Raytheon** JPS Communications Raleigh, NC USA		
Drawn By: JAC	Title CABLE, ACU-T RADIO EXTENSION - 13 FT		
Checked By: RBP	Size A	Document Number **5961-281013-00**	Rev A
	Issued Date JANUARY 5, 2004		Sheet _1_ of _1_

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