INTERNATIONAL CIVIL AVIATION ORGANIZATION
South American Regional Office

ICAO/UNDP REGIONAL PROJECT RLA/98/019
IMPLEMENTATION OF THE SAM DIGITAL NETWORK (REDDIG)

THIRD MEETING OF THE COORDINATION COMMITTEE

(Lima, Peru, 6 to 7 November 2002)

Agenda Item 5: Programme of the project future activities

(Presented by ICAO)

Summary

This working paper, related with Item 5 of the Agenda, presents information on future activities of the Project, to be carried out during the final implementation phase of the Project, which includes the installation, training, acceptance tests and transfer of services, foreseen to be executed starting at this date until the 1st April 2003.

1. Coordination with States on items related to installation and start of operation of the REDDIG

1.1 Installation of the REDDIG IDU equipment:

1.1.1 On 28 October 2002 the installation of SAEZ (Argentina) node was initiated and the activities of installation of the SUMU (Uruguay) node would start on 31 November.

1.1.2 The list of SEEE installers, which will be in charge of the installation and commissioning of the nodes, was communicated to the counterparts on due time, and the recently approved timetable (REDDIG Project Plan IDU-Training-PSAT-NAAT 1141440 V5) has been distributed to States.

1.1.3 The processing time for the installation and commissioning foreseen for normal nodes, according to the last approved timetable, is of 06 days. It is expected that the Administrations be able to appoint the personnel that will be in charge of the REDDIG maintenance in the referred process of installation and commissioning, in order that they can acquire a wider knowledge of the node and can benefit from the additional OJT that was agreed with the contractor.

1.1.4 The installation process includes the following:

a) Meeting with the CAA: During this meeting the contractor will coordinate with the CAA the development of activities, working schedule and other installation details;
b) Completion of the OUTDOOR equipment installation, mainly the SSPA;
c) Unpackaging, verification of provision, recording of the serial numbers;
d) Positioning and ANCLAJE of the internal equipment in its definite installation site;
e) Electrical power connection from the PDB to the IDU rack, and ODU, and verification;
f) Connection of the control cable IDU-ODU and verification;
g) Verification of the ODU functioning, switch of wave direction, M&C with the SSPA, reception of satellite signal in LNB; verification of operation frequencies;
h) Satellite access tests in coordination with PANAMSAT;
i) REDDIG network access tests in coordination with the SAEZ NCC and verification of the operation;
j) Connection of user equipment (voice and data circuits);
k) Tests with the REDDIG NCC and with user equipment.
l) Daily coordination meeting with the CAA, at the end of the day, to inform on progress made.

1.1.5 With the aim of carrying out a timely implementation, it will be necessary to make the best efforts to comply with the following:

a) Customs: It is necessary that ICAO and Ecuador, Colombia and Brazil may cooperate in the process and follow-up of customs procedures for the equipment. The foreseen date for the installation of the Guayaquil node is next 8 November; and for the Bogota node, 29 November. The installation of the Brazil nodes will start on 07 December 2002.

b) Installation of power distribution boards: The power distribution boards should be installed before the installation of the node by the SEEE, to whom this should be notified in accordance with the agreement 05 days before the IDU installation is started;

c) User circuits: The circuits to be connected to the REDDIG should be identified and programmed. The CAA should provide a list with the location of the circuits in the MDF, Rack, and equipment door, as it corresponds, and will verify that the circuits be programmed and ready to operate.

d) Coordination lines with manufacturer: the contractor will request, as established in the TSD, the lines to allow the remote monitoring from manufacturer and remote access using the INTERNET. The contractor will be in charge of all payments to be made (installation, monthly service and end of the service), for this reason, the Administrations, within possible, should provide assistance to the contractor with the PTT. This is due to the lines to be connected at its installations and that generally, the presentation of documentation of the installation site is a requirement of the PTT;

e) Licenses: Other important issue for the startup of the REDDIG network is that the nodes have the corresponding operation licenses, granted by the national authority in charge. In this regard, the States should make the maximum effort in order that the licenses be available before starting the IDU installation.

f) Personnel: It is necessary that the personnel in charge of the CAA systems programming be permanently available for any coordination with regard to such systems. Likewise, it is recommended that the documentation of CAA systems be in place and available to be consulted by the contractor installation personnel.

g) REDDIG Technical Coordinator: During the installation process, the REDDIG technical coordinator should be present in order to coordinate efficiently the works performed and, at the same time, be aware of the details of its node.

1.1.6 As part of the internal commissioning carried out by the SEEE, the contractor will complete an installation test form and will hand a copy of the document to the CAA. The CAA should simply sign a document acknowledging receipt of this document, indicating that the contractor has completed the document during the installation process of its node.

1.2 Discussion of the study presented by the Task Force related to a multinational mechanism for the REDDIG Administration:

1.2.1 Under this item, a study performed by the task force created during the RCC/2 Meeting of the REDDIG Coordination Committee (Lima, Peru, 31 July to 2 August 2002) will be presented to the Meeting. It is expected that the meeting make a decision on the basis of the submitted information.

1.2.2 Other matter related with this subject is the extension of the REDDIG satellite segment contract, in 05 or 10 years. The modality and costs of these options have been detailed in section 1.11 of WP/03 corresponding to Item 3. It is expected that the meeting make a decision in this regard.

1.3 Discussion of the INDOOR (IDU) equipment installation process, commissioning, visits and related documentation:

1.3.1 The "REDDIG Project Plan IDU-Training-PSAT-NAT- 1141440 V5" (PMP-V5) installation timetable, the installers itineraries for Phases I and II, and the list of measuring equipment being transported by the installers are included as **Appendix A** of the report.

1.3.2 Regarding the IDU installation dates and SEE internal commissioning, programmed in the PMP-V5 , the starting date foreseen to initiate the activities was last 28 October and the process would finalize on 28 December 2002. The details of the installation and commissioning process were presented and discussed in section 1.1 of this document. After the SEEE commissioning was carried out in the nodes, the contractor would initiate a testing phase in the network from 06 to 25 January 2003. Appendix B to this report contains the documents related to the installation guide (Installation Test Guide), and commissioning (Installation Test Record) that will be used by the contractor during the development of the referred activities.

1.3.3 During the current installation and commissioning process, and with the purpose of providing opportune and adequate assistance to States and at the same time avoiding any possible delay of the Project, the possibility that the communications expert carry out missions to Ecuador, Colombia, Uruguay, Venezuela, Suriname, Guyana, and French Guiana is being studied, considering that these States were not visited during the site survey phase. Likewise, it has been noted the convenience of carrying out a mission to Argentina, where the installation of the REDDIG NCC is being finalized, which would help to solve on time, for the remaining installations, the possible problems that could have been detected.

1.3.4 The following phase of the project is the training phase. In this regard, the States were informed that the dates of the REDDIG courses in Spanish and English would be from 13 to 24 January 2003 and from 27 January to 07 February 2003, in Bogota and Recife, respectively. The leveling course offered by the Colombian Administration would be dictated during the week from 06 to 10 January 2003 in Bogota, Colombia. The possibility of improving the training with an OJT course in one of the two NCCs is being analyzed.

1.3.5 The following phase of the Project includes the PSAT in-site acceptance tests, which, in accordance with the PMP-V5 programme, would start on next 29 January and would end on 21 March 2003. The in-site tests would be performed sequentially, one node at a time. The PSAT would begin with the SAEZ node and would end in the Curitiba node (Brazil). During this process, the Project Office would participate directly in the execution of the tests in each node.

1.3.6 After satisfactory completion of the PSAT, acceptance tests in the network would be initiated, foreseen for the period 01 to 28 March 2003. After obtaining satisfactory results, the transfer of the services and start of operation of the network would be initiated on 01 April 2003.

1.3.7 The activation of the website is considered among the activities programmed by the Project Office, which is estimated for the last two weeks of November. The information available would be the following:

a) Introduction;
b) Tutorial of network operation;
c) Agreement and amendments;
d) Project timetables;
e) Project follow-up charts;
f) Nodes documentation;
g) Equipment technical documentation; and
h) Other documents related with the project, and discussions forum.

1.3.8 Interalia, the activities to be performed by the project are: review of the PSAT, NAT documents and their approval, as well as the review of the training material document.

2. **Suggested action:**

2.1 The meeting is invited to note the information presented and to formulate a conclusion recommending the States to adopt the necessary measures to avoid the delay of the starting of operation of the REDDIG, as web as to study and make a decision with regard to the study presented by the REDDIG task force related to the REDDIG new administration scheme and, likewise, that a decision be adopted with regard to the contracting of a new satellite segment.

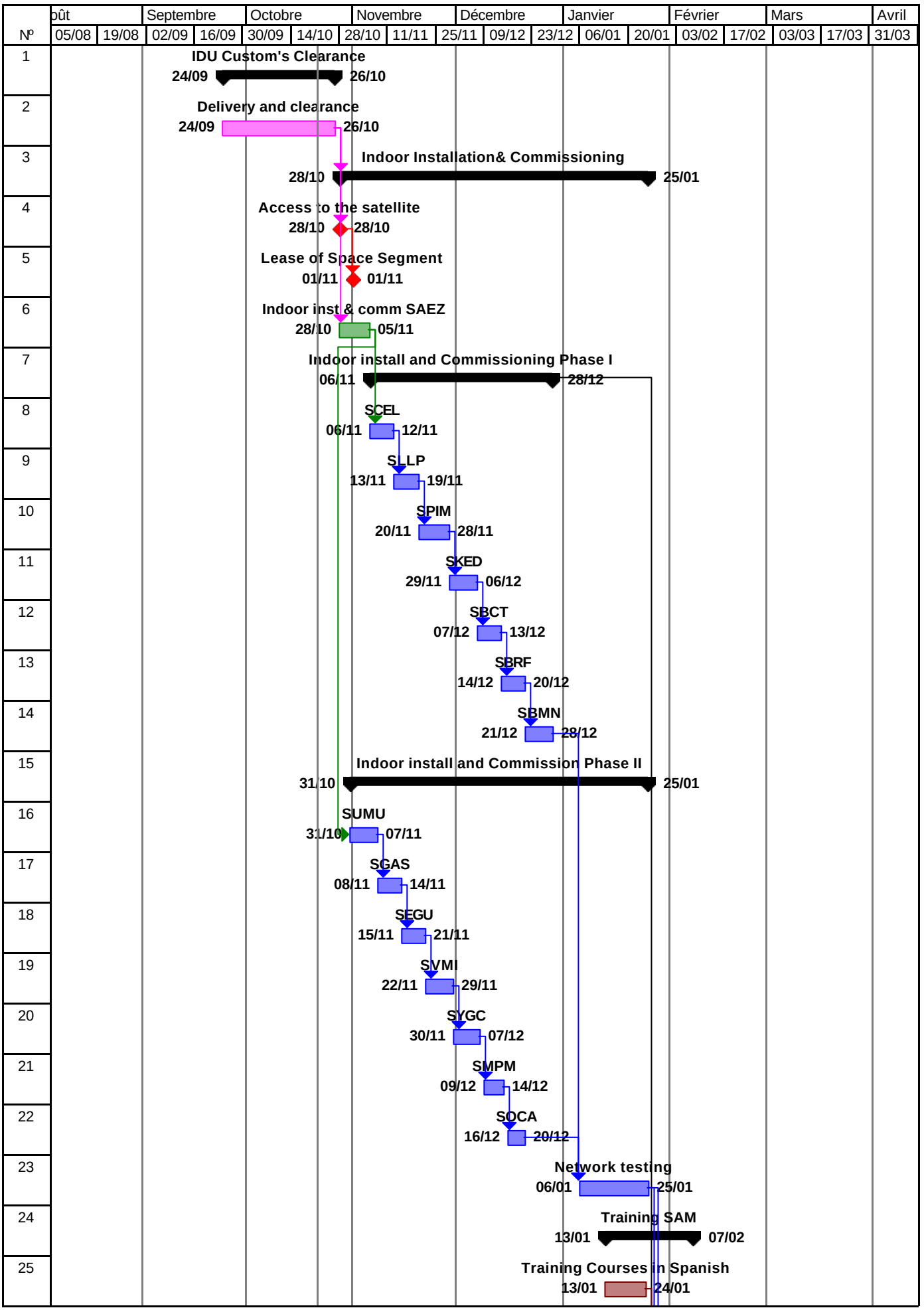
END

APPENDIX A

REDDIG PROJECT PLAN

IDU-TRAINING-PSAT-NAT

DOC: 1141440 V5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17/02
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17/03
31/03
1
IDU Custom's Clearance
24/09
26/10
2
Delivery and clearance
24/09
26/10
3
Indoor Installation& Commissioning
28/10
25/01
4
Access to the satellite
28/10
28/10
5
Lease of Space Segment
01/11
01/11
6
Indoor inst & comm SAEZ
28/10
05/11
7
Indoor install and Commissioning Phase I
06/11
28/12
8
SCEL
06/11
12/11
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SLLP
13/11
19/11
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SPIM
20/11
28/11
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SKED
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12
SBCT
07/12
13/12
13
SBRF
14/12
20/12
14
SBMN
21/12
28/12
15
Indoor install and Commission Phase II
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25/01
16
SUMU
31/10
07/11
17
SGAS
08/11
14/11
18
SEGU
15/11
21/11
19
SVMI
22/11
29/11
20
SYGC
30/11
07/12
21
SMPM
09/12
14/12
22
SOCA
16/12
20/12
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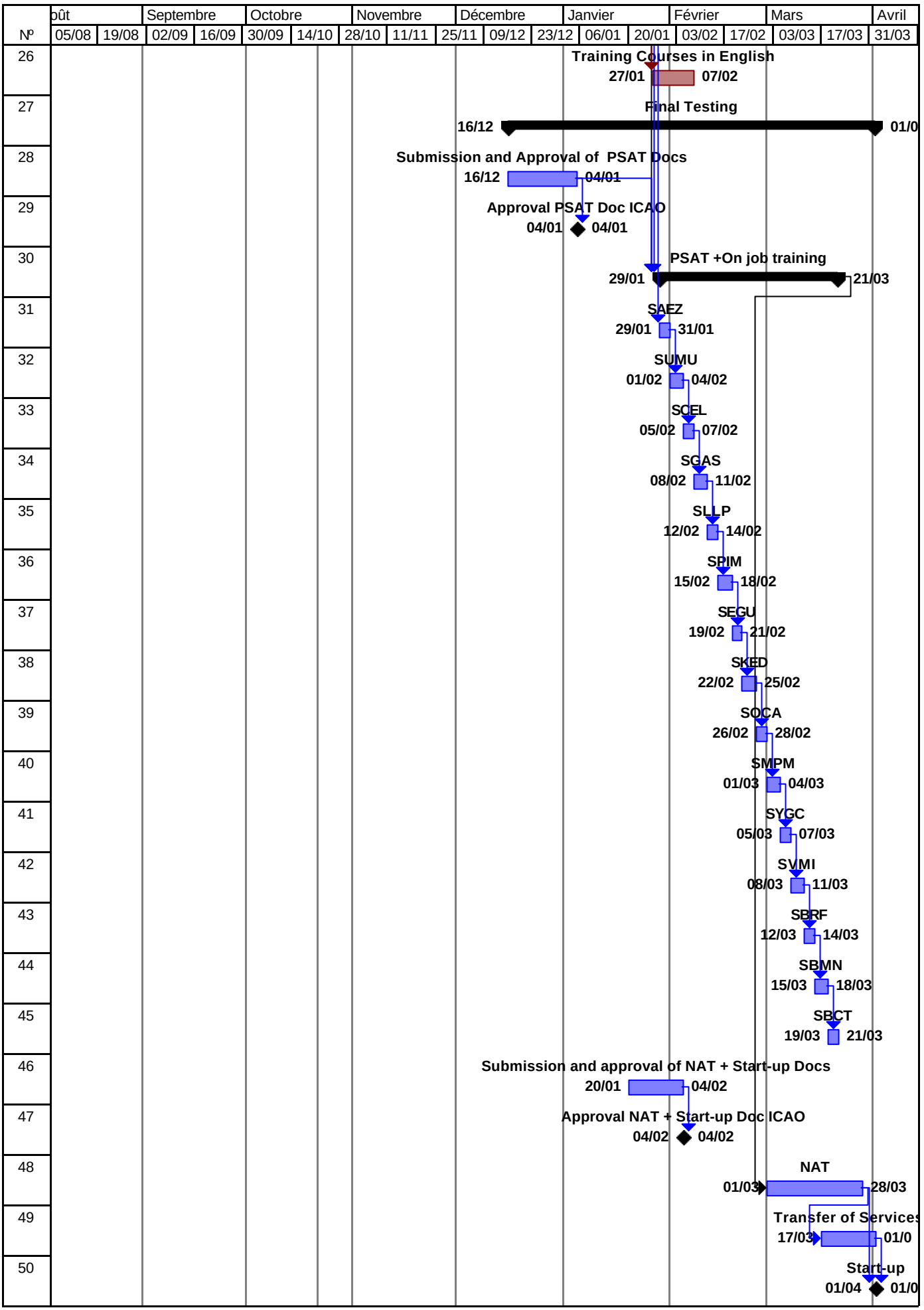
Network testing
06/01
25/01
24
Training SAM
13/01
07/02
25
Training Courses in Spanish
13/01
24/01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Training Courses in English
27/01
07/02
Final Testing
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01/0
Submission and Approval of PSAT Docs
16/12
04/01
Approval PSAT Doc ICAO
04/01
04/01
PSAT +On job training
29/01
21/03
SAEZ
29/01
31/01
SUMU
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SCEL
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SGAS
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SLLP
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SPIM
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SEGU
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SOCA
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28/02
SMPM
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SYGC
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07/03
SVMI
08/03
11/03
SBRF
12/03
14/03
SBMN
15/03
18/03
SBCT
19/03
21/03
Submission and approval of NAT + Start-up Docs
20/01
04/02
Approval NAT + Start-up Doc ICAO
04/02
04/02
NAT
01/03
28/03
Transfer of Services
17/03
01/0
Start-up
01/04
01/0

PHASE I - Itinerary IDU REDDIG October- December 2002 : Jean-Luc Padilla / Kevin Ingram

Date	From	Depart Time	To	Arrive Time	Airline	Flight
11/6/2002	Buenos Aires (EZE)	8:05	Santiago (SCL)	10:20	Lan Chile	LA0410
	Ministro Pistarini Arprt		Arturo Merino Benitez Arpt			
11/13/2002	Santiago (SCL)	7:45	La-Paz(LPB)	11:20	Lan Chile	LA0960
	Arturo Merino Benitez Arpt		El Alto Arpt			
11/20/2002	La Paz (LPB)	9:00	Lima (LIM)	9:40	Boliviano	926
	El Alto Arpt		Chavez intl Arprt			
11/29/2002	Lima (LIM)	9:20	Bogota (BOG)	12:30	Aces	530
	Chavez intl Arprt		Eldorado Arpt			
12/7/2002	Bogota (BOG)	22:00	Sao Paulo (GRU)	7:00	Varig	8695
	Eldorado Arpt		Guarulhos intl Arpt			
12/8/2002	Sao Paulo (GRU)	9:00	Curitiba (CWB)	10:00	Varig	8735
	Guarulhos intl Arpt		Alfonso Pena Arpt			
12/14/2002	Curitiba (CWB)	7:30	Reciffe (REC)	11:20	TAM	3528
	Alfonso Pena Arpt		Guararapes Intl Arpt			
12/21/2002	Reciffe (REC)	7:15	Manaus (MAO)	12:50	Varig	2262
	Guararapes Intl Arpt		Eduardo Gomes Intl Arpt			
12/29/2002	Manaus (MAO)	2:10	Rio (GIG)	9:05	Varig	2207
	Eduardo Gomes Intl Arpt		Rio Intl Arpt			

PHASE II - Itinerary IDU REDDIG October- December 2002 : Bernard COURT / Cristian RUSSO

Date	From	Depart Time	To	Arrive Time	Airline	Flight
10/31/2002	Buenos Aires (EZE)	11:45	Monevideo (MVD)	12:35	United	855
	Ministro Pistarini Arprt		Carrasco Arprt			
11/9/2002	Montevideo (MVD)	9:00	Ascuncion (ASC)	23:50	Mercosur	700
	Carrasco Arprt		Silvio Pettirossi Arprt			
11/15/2002	Ascuncion (ASC)	4:45	Sao Paulo (GRU)	7:30	TAM	8088
	Silvio Pettirossi Arprt		Guarulhos intl Arprt			
	Sao Paulo (GRU)	9:30	Lima (LIM)	11:35	Varig	8936
	Guarulhos intl Arprt		Chavez intl Arprt			
11/16/2002	Lima (LIM)	4:30	Guayaquil (GYE)	6:15	Aeropostal	925
	Chavez intl Arprt		Simon Bolivar Arprt			
11/22/2002	Guayaquil (GYE)	7:05	Caracas (CCS)	10:45	Aeropostal	925
	Simon Bolivar Arprt		Simon Bolivar Arprt			
11/30/2002	Caracas (CCS)	10:30	Port of Spain (POS)	12:10	British West Indies	832
	Simon Bolivar Arprt		Piarco Arpt			
	Port of Spain (POS)	13:45	Georgetown (GEO)	14:50	British West Indies	425
	Piarco Arpt		Georgetown Arpt			
12/9/2002	Georgetown (GEO)	13:00	Paramaribo (PMB)	14:45	Suriname Airways	PY918
	Georgetown Arpt		Zanderij intl Arpt			
12/16/2002	Paramaribo (PMB)	16:00	Cayenne (CAY)	16:45	Surinam Airways	PY9915
	Zanderij intl Arpt		Cayenne Arpt			
12/21/2002	Cayenne (CAY)	18:40	Paris	7:00	Air France	AF3683
	Cayenne Arpt		Orly Arpt	12/22/2002	12/22/2002	

Test equipment for REDDIG IDU commissioning

Phase 1

1.	Spectrum Analyser	HP	Model 8561B	s/n 3147A00869
2.	Power Meter	Marconi	Model 6960A	s/n 2623
3.	Power Detector	Marconi	Model 6910	s/n 4437
4.	Oscilloscope	Fluke	Model 123	s/n DM7540045
5.	Digital Camera	Kodak		KJCAI 3404075
6.	FRAD	Memotec	Model CX 800	s/n ?
7.	Various connecting leads etc. (including 3m Rhophase)			

Phase 2

1.	Spectrum Analyser	HP	Model 8561B	s/n 2925A00200
2.	Power Meter Model	Marconi	Model69670	s/n 326990/
3.	Power Detector	Marcino	Model 6910	s/n 3086
4.	Oscilloscope	Fluke	Model 123	s/n DM7930015
5.	Digital Camera	Olympus	Model C-840L	s/n 36006544
6.				
7.	FRAD	Memotec	Model CX 800	s/n ?
8.	Various connecting leads etc. (including 3m Rhophase)			

APPENDIX B

INSTALLATION TEST GUIDE

INSTALLATION TEST RECORD

INTERNATIONAL CIVIL AVIATION ORGANIZATION

IMPLEMENTATION OF THE SAM DIGITAL NETWORK (REDDIG)

INSTALLATION GUIDE

Site name :

Index	3		
Date	14/10/2001		
Approved by	K. FOURATI		
Approved by	M. JONES		

1. TABLE OF CONTENTS

2. INTRODUCTION

2.1. Description

This document describes the work to be carred out be the installation teams on each site. Each team will consist of one wireman/ technocoan and one test engineer.

On each site the antenna and cross site wiring should have been installed before we start. The antenna has been pointed at the correct satellite and its receive performance verified with a test LNB. The RF cross site cables have also been tested for loss at a single frequency.

The aim of the installation is to complete the RF installation (add the SSPA's and transmit waveguide) and test the RF system with the satellite operator (PanAmsat). Additionally all the indoor equipment is to be installed and connected to the power supply and checked for correct operation as in the factory. Any errors found in the documentation during this assembly phase must be reported to SEEE for correction before the final documentation is released.

The equipment is to be connected to the customer equipment where possible. On some sites all this wiring will be performed by the installation team, on others the AFTN and Radar circuits are to be connected by the local customer. In every case the CAA should be aware of this.

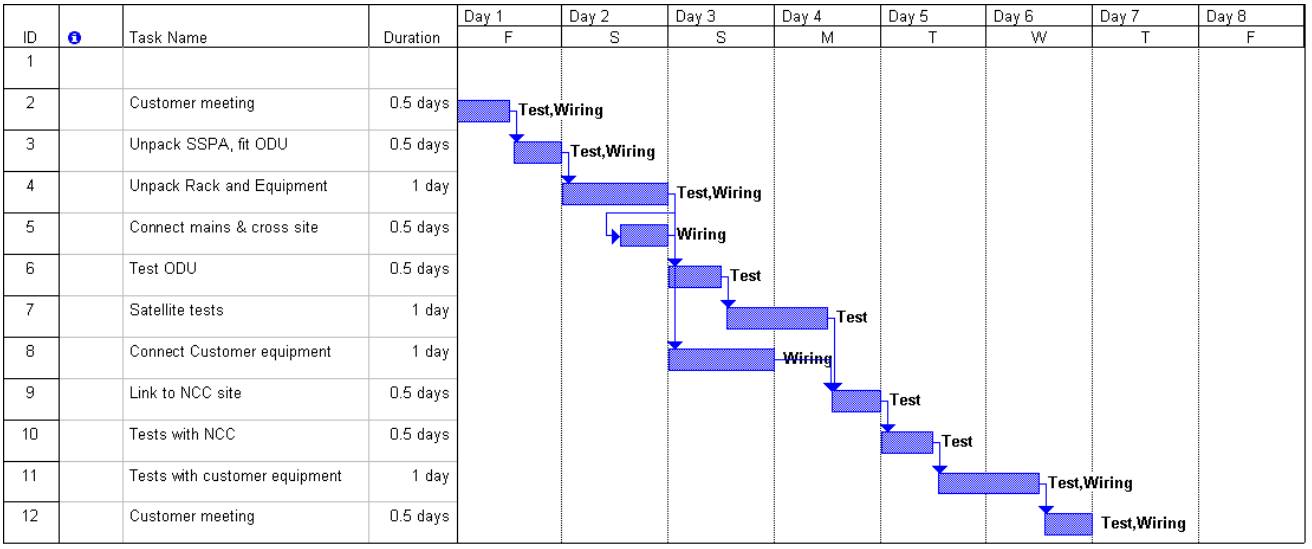
The final stage is to try to test commu ications between the REDDIG equipment and the customers equipment. This will require considerable co-operation both with the local operators and the NCC site to enable correct configuration of all the equipment.

If possible the equipmemt is to be left in an operating condition, linked via the satellite to the operating Network Control Centre (NCC), initially Buenos Aires.

3. TASK DESCRIPTIONS

3.1. Overview

3.1.1. Site Schedule



Note that this is only a guide.

On most sites there will be five to six days available for work, depending on exact arrival and departure times. On sites expected to be more complex, more time is allowed. Additionally there will be two SEEE engineers supporting the installation effort for this period.

3.1.2. Customer Meeting

This meeting should take place before work starts and is to agree the following:

a) Point of contact (name, telephone for all matters.

b) Approximate installation plan (based on schedule above). Check that people will be available to assist on the days required, particularly with testing at weekends if required.

c) Name of technician appointed to help in installation and testing and to be trained in basic control of the earth station.

d) Required access to site areas needed for the installation. Verify that areas required for the installation are clear of other equipment, and that access for cable runs is available.

e) Agree provisions of site survey
- Positions of racks
- Position of cable runs
- SEEE supplied cabling (See appendix)
- Customer supplied cabling

f) Customer to provide interface details (connector types, pinouts, baud rate etc) of all equipment to be connected to the REDDIG equipment.

3.1.3. Unpack SSPA, Complete Outdoor Installation

Unpack the SSPAs and remaining metalwork for the antenna installation. Note that the SSPA support plate is packed with one of the amplifiers, and the connectors required for use with the amplifiers are with the amplifiers.
The transmit waveguide, and SSPA mounting brackets were supplied on the antenna delivery and should be stored at the airport.

Using the System installation Instructions RF:
- Fit the amplifiers support plate (section 2.1.4)
- Fit the SSPA amplifiers using the brackets provided (drawing 402390 sheet 1)
-. Fit the transmit waveguide to the hub (drawing 402390 sheet 5)

3.1.4. Unpack racks and Equipment

- Unpack racks; remove castors and position on floor. Mark position of the four fixing holes. Remove the racks and drill the floor as require for the fixings (supplied for computer room floor or concrete floor as required.)
- Reposition Racks and bolt securely.
-.Refit all the equipment as per the site rack layout drawing. Note the serial numbers of the equipment against the supplied list and the installation test schedule. The modems and FRADs are pre programmed to work in one position only.
- Re connect all the cables to the units to the site wiring schedule.

3.1.5. Connect Mains and Cross Site

BEFORE WORKING ON THE MAINS DISTRIBUTION BOARD VERIFY THAT THE SUPPLY IS OFF.

- Check that the mains voltage is correct.

Using the System Installation instructions Cross site;

- Fit the SSPA mains connectors.
-. Connect the third outdoor cable to the waveguide switch driver (relay) box, drawing 113335.

Using the site Electrical Distribution Board Assembly notes;

-.Fit the three locking isolators to the wall next to the power distribution board.
- Connect the three cross site power cables to the locking isolators.
- Using the spare cable connect the locking isolators to the power distribution board.

-. Run the three mains cables and earth between the racks and the power distribution board.
-. Connect the three mains cables to the three rack mains fuseboards in the top of the rack.
- Connect the earth cable between the rack earth and the local building earth for the power distribution board. Note that this is the safety earth for the rack.
-. Connect the three mains cables to the power distribution boards.

-. Check that no rack equipment is plugged in or SSPA connected and then test each mains circuit.

Using the System Installation instructions Cross site;

- Assemble and install the cross site RS485 cable assembly between the racks and the SSPAs. (drawing 114051).
- Assemble and install the waveguide switch control cable between the rack and the waveguide switch driver box.

3.1.6. Test Outdoor unit

- From system controller verify the correct operation of the waveguide switches.
- From the system controller verify that there is communications with the SSPAs
- On a suitable test frequency check the SSPA operation (Installation test record section 4.3)
-. Verify that both LNB's appear to be receiving a signal from the satellite and are correctly locked to frequency. (Use the NCC signal as a reference if necessary).

3.1.7. Satellite Tests

-. Contact PanAmsat control as soon as the system is ready for test to arrange for test times.
-. Follow schedule specified by PanAmsat and record results in the Installation test record.

3.1.8. Link to NCC site

- Contact the NCC site operator and link modems to the NCC.
-. Upgrade the Comsat software.
-. Report any changes to the config files necessary following testing (frequencies, modem power setting etc)
-. Verify successful link to NCC.
-. Use SEEE supplied FXS phone to communicate with NCC over network.

3.1.9. Connect to customer equipment

Refer to the appendix for the expected circuits to each site.

Refer to the following site drawings;

SAEZ	208046
SLLP	208047
SBMN	208048
SBRF	208049
SBCT	208050
SCEL	208051
SKED	208052
SEGU	208053
SYGC	208054
SOCA	208055
SGAS	208056
SPIM	208057
SMPM	208058
SUMU	208059
SVMI	208060

V24 interface cable assy 114050.

-. Using the site survey information and any further provided connect all telephone circuits to the rack.

- On site where it is specified in the site survey additionally connect the AFTN and radar circuits to the customer interface specifications. (obtained at the initial meeting)

3.1.10. Tests with NCC

3.1.11. Tests with Customer Equipment

3.1.12. Customer Meeting

This meeting should be held on the final day and list the progress made (Installation, wiring), Achievements (Antenna registration tests with NCC) and outstanding items (Interfaces not tested/ working, with reasons (equipment configuration, lack of information, lack of physical port availability).

This is very important information to enable us to plan for any future visits that may be required by engineers.

4. BASIC TOOL KIT FOR THE IDU INSTALLATION

- Soldering Iron
- Mini vice
- Solder 60/40
- Selection of screwdrivers, pozidrive, phillips, and flat.
- Scalpel & trimming knife with spare blades
- Hacksaw and spare blades
- File kit
- Allen keys (both metric and imperial)
- Small spanner set (both metric and imperial)
- Micro side cutters
- Micro long nose pliers
- Standard side cutters
- Standard long nose pliers
- Tape measure and 12” ruler
- Sealant gun & sealant
- Silicon grease
- Self-amalgamating tape
- Small hammer
- Claw hammer
- Small spirit level
- Crescent multi pliers
- 2 x 10” adjustable spanners
- Mains extension lead
- Hammer drill
- Battery drill & charger (110/220V)
- Twist drill set
- Hole saws (20mm, 25mm, 32mm)
- Masonry drills
- Crimp tool (red/blue/yellow per-insulated terminals)
- Torch
- RJ11/45 Crimp tool
- Krone Insertion tool

5. APPENDIX

5.1. Circuits on each site.

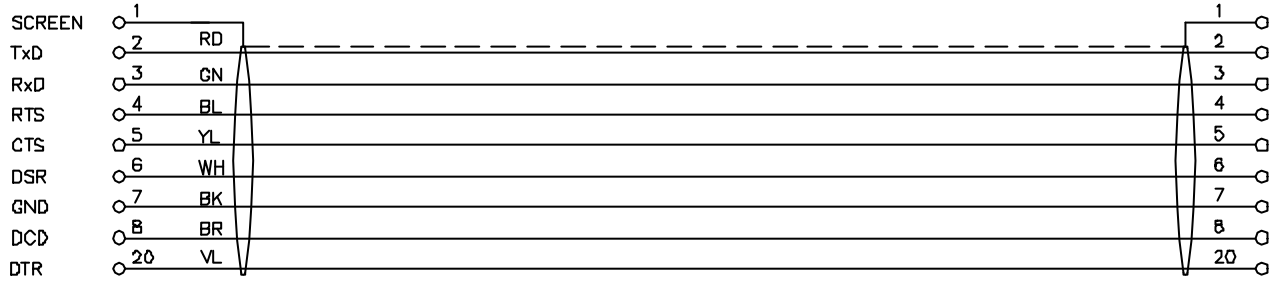
SITE CODE	SAEZ	SLLP	SBMN	SBRF	SBCT	SCEL	SKED	SEGU	SYGC	SOCA	SGAS	SPIM	SMPM	SUMU	SVMI
NODE	Ezeiza	La Paz	Manaus	Recife	Curitiba	Santiago	Bogota	Guayaquil	Georgetown	Cayenne	Asuncion	Lima	Paramaribo	Montevideo	Maiquetia
COUNTRY	Argentina	Bolivia	Brazil	Brazil	Brazil	Chile	Colombia	Ecuador	Guyana	Fr Guyana	Paraguay	Peru	Surinam	Uruguay	Venezuela
Access										09:00-1700 Mon-Fri			09:00-1700 Mon-Sat		
Power															
PDB Fitted	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PDB Tested	220V	220V	220V	220V	220V	220V	110V	110V	110V	220V	220V	220V (Delta)	110V	220V	110V
Voice Interface															
E1			TBD				2	2				1			
FXS			TBD		3									4	
FXO	1	4	TBD	1	1	1			4	6	3		3	6	1
E&M	11	4	TBD	6	6	8			2		3		3		7
AFTN Data															
Expected No Ports	6	3	5	1	4	2	4	3	3	2	2	7	3	2	7
Interface	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24
Radar Interface															
Expected No Ports	3	2	4		4	1	2					1	4	4	
Interface	V.24	V.24	V.24		V.24	V.24	V.24					V.24	V.24	V.24	
Backup Network															
ISDN	Bri- Euro	Bri- Euro	PRI	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro
Leased Line	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35

5.2. Cables, Connectors supplied to each site

The following cables and connectors are supplied by SEEE in accordance with the site survey documents; The power distribution board is provided by SEEE but fitted by the CAA. In all other cases, where SEEE provide the materials they are responsible for installation. Where the CAA is responsible for materials they are also responsible for installation.

SITE CODE		SAEZ	SLLP	SBMN	SBRF	SBCT	SCEL	SKED	SEGU	SYGC	SOCA	SGAS	SPIM	SMPM	SUMU	SVMI
NODE		Ezeiza	La Paz	Manaus	Recife	Curitiba	Santiago	Bogota	Guayaquil	Georgetown	Cayenne	Asuncion	Lima	Paramaribo	Montevideo	Maiquetia
COUNTRY		Argentina	Bolivia	Brazil	Brazil	Brazil	Chile	Colombia	Ecuador	Guyana	Fr Guyana	Paraguay	Peru	Surinam	Uruguay	Venezuela
Access											09:00-1700 Mon-Fri			09:00-1700 Mon-Sat		
Power																
PDB Fitted		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PDB Tested		220V	220V	220V	220V	220V	220V	110V	110V	110V	220V	220V	220V (Delta)	110V	220V	110V
Voice Interface																
E1				**TBD**				2	2				1			
FXS				**TBD**		3									4	
FXO		1	4	**TBD**	1	1	1			4	6	3		3	6	1
E&M		11	4	**TBD**	6	6	8			2		3		3		7
Cables		Provided	Provided	**E1 provided**	Provided	Provided	Provided	Provided	Provided	Provided	Provided	Provided	Provided	Provided	Provided	Provided
AFTN Data																
Expected Ports	No	6	3	5	1	4	2	4	3	3	2	2	7	3	2	7
Interface		V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24	V.24
Cables		**CAA**	Provided	Provided	**CAA**	**CAA**	**CAA**	Provided	Provided	Provided	Provided	Provided	Provided	Provided	Provided	Provided
Radar Interface																
Expected Ports	No	3	2	4		4	1	2					1	4	4	
Interface		V.24	V.24	V.24		V.24	V.24	V.24					V.24	V.24	V.24	
Cables		**CAA**	**CAA**	**CAA**		**CAA**	**CAA**	**CAA**					Provided	**CAA**	Provided	
Backup Network																
ISDN		Bri- Euro	Bri- Euro	TBA	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro	Bri- Euro
Leased Line		V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35	V.35

5.3. V24 Cable



DB25(M)
325118
COVER
T20-000016

CABLE
8-CORE 7/.2
O/A SCREEN

DB25(M)
325118
COVER
T20-000016

INTERNATIONAL CIVIL AVIATION ORGANIZATION

IMPLEMENTATION OF THE SAM DIGITAL NETWORK (REDDIG)

INSTALLATION TEST RECORD

Site name :

Index	3		
Date	14/10/2001		
Approved by	K. FOURATI		
Approved by	M. JONES		

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2. TEST EQUIPMENT

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2. Marconi Instruments Power Meter Model 69670
3. Marconi Instruments Power Detector Model 6910
4. Fluke Scopemeter (Oscilloscope) Model 123
5. Digital Camera (Olympus) Model C-840L
6. FRAD Interface unit type CX 800
7. Various connecting leads etc. (including 3m Rhophase)

3. INTRODUCTION

3.1. Description

This document forms a record of the configuration at installation of the equipment and interfaces of the delivered equipment and of testing carried out.

4. SERIAL NUMBERS

Record the serial numbers of the equipment installed. Verify that it is the same as the supplied list (document Serial Numbers Iss8)

P/Number	Description	Serial number	Correct
			Y/N
	ASSY EQUIPMENT RACK		
X02-9762XX	ASSY RACK WIRED		
H10-0000XX	MPS FRAD CX950 A		
H10-0000XX	MPS FRAD CX950 B		
H10-0000XX	MUX FRAD CX950 A		
H10-0000XX	MUX FRAD CX950 B		
H07-000042	LINKWAY 2100 IDU A		
H07-000042	LINKWAY 2100 IDU B		
H25-000111	Router HP PROCURVE SWIT		
V126-400015	ABS 4000 Baseband Switch		
	ASSY RACK COMPUTER, 9762		
H28-000031	PC WILD CAT		
H25-000108	Keyboard ACCURATUS 540		
H25-000109	Monitor VM1402 17" COLOUR		
H25-000106	Printer HP LASERJET 2200		
X02-976202	**ASSY RF EQUIPMENT & MOUNTING**		
P14-000085	HPA/BUC 40W 5.85-6.425GH		

5. DESCRIPTION OF TESTS

5.1. Power System

5.1.1. Mains Voltage

Record the mains voltage at the output of the power distribution board.

5.1.2. Mains Frequency

Record the mains frequency at the output of the Power distribution board

5.2. Antenna

5.2.1. General Information

The satellite being used for these tests does not have a beacon signal suitable for these tests. Therefore testing must be performed with the help of the PanAmsat operations centre.

If possible conduct these tests prior to the formal satellite test using the beacon on the adjacent PAS3-R satellite. However the values recorded here should be those taken with the help of PanAmsat on PAS1-R. The angles and PAS3 beacon EIRP for all sites are contained in the appendix.

Record date of satellite test……

Record the satellite used ……

Record PanAmsat operator

Name……..

Telephone…...

5.2.2. Receive Cross polar

Peak the antenna vertical polarisation. Rotate polarisation to null beacon signal.

Record polarisation level, dB down on boresight gain. This should be greater than -35dB.

Result dB

5.2.3. Transmit Cross Polar

Speak to the PanAmsat operations centre and record the result measure during the antenna test.

Result dB

5.2.4. G/T Vertical Polarisation

Connect spectrum analyser to output of the LNX by inserting a 2 way splitter in the Rx cable. Ensure that the 10MHz and DC signals are being received by the LNX but there is no DC present at the coupled port. Connect the spectrum analyser to the coupled port.

Tune to the beacon frequency at L-band. The LNX local oscillator is 5.15GHz, so the L-band frequency = 5.15- Rx freq (GHz)

Peak in azimuth and elevation. Optimise polarisation.

Record C/No. **Result** **dBc / Hz**

Calculate G/T using following formula.

G/T = C/No - EIRP + FSL + K + Atmosphere Loss

EIRP of the beacon signal is from the PanAmsat operator

Loss = 196.5dB @ 4GHz

K = -228.6dBW/K

Atmospheric loss =.2dB

Result **dB / K**

5.3. RF Output

5.3.1. Saturated power level channel A

Connect the power meter to amplifier A power monitor coupler. Verify that amplifier A is switched to load (Channel B to antenna). Record the amplifier coupling factor.

Result……dB

On the modem set CW output and enable the SSPA. Decrease the amplifier attenuation until the amplifier is saturated. Record the output power displayed on the power meter

Result……..dBm

Calculate the output power dBW. Verify that this is greater than 16dBW (40W).. If it is not follow 3.3.2. Else go to 3.3.3

Result…….dBW

Record the modem output as displayed on the control screen.

Result……..dB

5.3.2. Set modem Attenuation.

If the amplifier cannot be saturated using the attenuator, due to cable loss it is necessary to change the modem attenuation. Increase the modem output until saturation occurs. Record the output as displayed on the modem control screen

Result…….dBm

Note that this value is only changed in test mode. Report the new setting to the NCC site and ensure that the modem config file is updated so that the changed settings are available after a reset.

5.3.3. Saturated power level channel B

Connect the power meter to amplifier B power monitor coupler. Verify that amplifier A is switched to load (Channel A to antenna). Record the amplifier coupling factor.

Result……dB

On the modem set CW output and enable the SSPA. Decrease the amplifier attenuation until the amplifier is saturated. Record the output power displayed on the power meter

Result……..dBm

Calculate the output power dBW. Verify that this is greater than 16dBW (40W).. If it is not follow 3.3..4. Else go to 3.3.5

Result…….dBW

Record the modem output as displayed on the control screen.

Result……..dB

5.3.4. Set modem Attenuation B

If the amplifier cannot be saturated using the attenuator, due to cable loss it is necessary to change the modem attenuation. Increase the modem output until saturation occurs. Record the output as displayed on the modem control screen

Result…….dBm

Note that this value is only changed in test mode. Report the new setting to the NCC site and ensure that the modem config file is updated so that the changed settings are available after a reset.

5.4. Telephone Interfaces

5.5. AFTN Interfaces

5.6. ATN Interfaces

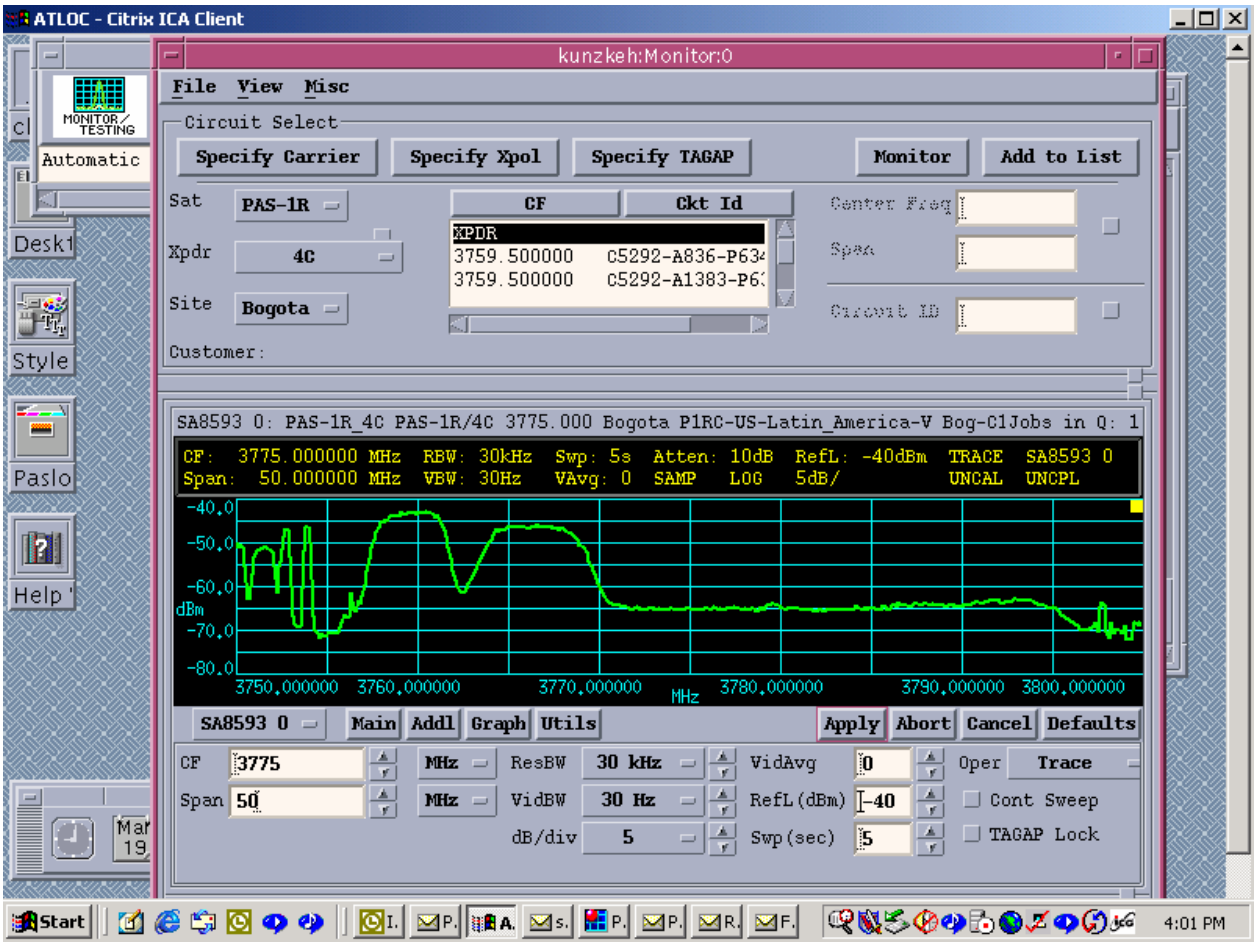
5.7. Backup modem

5.8. ISDN Interface

6. APPENDIX

a) Satellite Identification

The following spectrum analyser plot has been sent by Pan-Am sat to aid identification of the satellite.



b) Satellite look angle and beacon Power (Pas1-R and Pas 3-R)

SITE CODE		SAEZ	SLLP	SBMN	SBRF	SBCT	SCEL	SKED	SEGU	SYGC	SOCA	SGAS	SPIM	SMPM	SUMU	SVMI
NODE		Ezeiza	La Paz	Manaus	Recife	Curitiba	Santiago	Bogota	Guayaquil	Georgetown	Cayenne	Asuncion	Lima	Paramaribo	Montevideo	Maiquetia
COUNTRY		Argentina	Bolivia	Brazil	Brazil	Brazil	Chile	Colombia	Ecuador	Guyana	Fr Guyana	Paraguay	Peru	Surinam	Uruguay	Venezuela
SITE LOCATION																
LONGITUDE	**deg E**	**-58.54**	**-68.19**	**-60.05**	**-34.93**	**-49.24**	**-70.74**	**-74.14**	**-79.89**	**-58.25**	**-52.36**	**-57.51**	**-77.11**	**-55.20**	**-56.02**	**-66.98**
LATITUDE	**deg N**	**-34.81**	**-16.51**	**-3.02**	**-8.14**	**-25.40**	**-33.39**	**4.70**	**-2.16**	**6.50**	**4.82**	**-25.24**	**-12.02**	**5.46**	**-34.83**	**10.60**
ALTITUDE m	**m**	**66.00**	**4080.00**	**80.00**	**51.00**	**934.00**	**743.00**	**2566.00**	**8.00**	**27.00**	**14.00**	**122.00**	**64.00**	**8.00**	**29.00**	**57.00**
BEACON EIRP (dBW) (PAS3R)																
TM1 (4.1985 GHz)		>5.7	>5.7	>5.7	>5.7	>5.7	>5.2	>5.7	>5.7	>5.7	>5.7	>5.7	>5.7	>5.7	>5.7	>5.7
TM2 (4.1990 GHz)		>6.7	>6.7	>6.7	>6.7	>6.7	>6.2	>6.7	>6.7	>6.7	>6.7	>6.7	>6.7	>6.7	>6.7	>6.7
ANTENNA POINTING																
AZIMUTH to PAS-3R	deg E	25.96	58.87	80.26	-45.05	14.29	43.70	97.73	87.12	112.55	116.98	31.27	72.92	113.78	22.03	112.46
ELEVATION to PAS-3R	deg	46.28	55.24	69.68	76.55	59.49	41.11	53.37	47.16	70.57	77.62	56.32	48.30	74.30	47.21	59.50
POLAR- PAS-3R		-21.06	-55.16	-79.81	44.48	-12.88	-35.23	80.96	-86.39	66.58	62.63	-28.01	-69.22	65.64	-17.94	65.28
AZIMUTH to PAS-1R	**deg E**	**22.87**	**56.44**	**78.91**	**-51.46**	**9.80**	**41.22**	**98.36**	**86.91**	**115.68**	**123.04**	**27.50**	**71.63**	**117.86**	**18.83**	**114.50**
ELEVATION to PAS-1R	**deg**	**47.04**	**57.09**	**71.97**	**74.80**	**59.92**	**42.35**	**55.62**	**49.41**	**72.69**	**79.66**	**57.33**	**50.41**	**76.41**	**47.86**	**61.58**
POLAR- PAS-1R		**-18.61**	**-53.04**	**-78.53**	**50.78**	**-8.84**	**-33.36**	**80.45**	**-86.22**	**63.63**	**56.63**	**-24.67**	**-68.17**	**61.69**	**-15.36**	**63.44**
EARTH STATION																
ANT Tx GAIN @6GHz	dBi	44.95	44.95	44.95	44.95	44.95	44.95	44.95	44.95	44.95	44.95	44.95	44.95	44.95	44.95	44.95
ANT Rx GAIN @3.775GHz	dBi	41.95	41.95	41.95	41.95	41.95	41.95	41.95	41.95	41.95	41.95	41.95	41.95	41.95	41.95	41.95
Tx POWER	W	7.50	11.50	13.60	10.50	15.30	5.30	4.60	6.30	29.10	21.90	8.30	8.70	32.50	9.20	13.30
Tx PWR DENSITY @ FEED	dBW/Hz	-48.34	-46.49	-45.76	-46.88	-45.25	-49.85	-50.47	-49.10	-42.45	-43.69	-47.90	-47.70	-41.97	-47.45	-45.85
ES NOISE TEMP	K	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00