

TWSTFT report in NTSC

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Introduction

The TWSTFT link between NTSC (National Time Service Center, the Chinese Academy of Sciences) and CRL—now is named NICT (National Institute of Information and Communications Technology) via satellite JSAT was established in October 1998.

- The VSAT antenna is 1.8 meters ellipse antenna; transmitter and receiver to combine Up and Down converter together, it is made by SSE Company of America. The Modem type is Atlantis (AOA) modem.
- NTSC—NICT link is used for the TAI computation since January 5,2002(MJD 52279
- Here is the photograph for our system



Fig.1 1.8 meters ellipse antenna



● Fig.2 Atlanntis (AOA) modem

Now some TWSTFT links have used multi-channel modem.

In 2003 March, NICT has set the new modem at NICT and NTSC link, The new modem Cosmo Research can simultaneously carry out time transfer with maximum 7 stations(There are 8 RX unit, one is for calibration and 7 for data transmission).

See Fig. 3



Fig 3. NICT Modem

We parallel use such two modems for TWSTFT more than one year. Since 2005 June in Asia-Pacific Two-way Link has used NICT modem for TWSTFT. We have stopped the AOA modem.

As I have mentioned , in our original earth station we used SSE RFU. The SSE product is too many unit combine together and fix outdoor, it is very easily to be broken by rainy . To repair the RFU is big problem. The best way is to develop new transceiver for NTSC TWSTFT station.

- In order to improve our system , **we have built two new TWSTFT stations** in 2005 March. One is for NTSC and NICT link, another one will be used for new TWSTFT link with Europe. Our new system as following.



Fig.4 Two sets of Up/Down Converters



Fig.5 SSPA for NTSC—NICT and new link with Europe



Fig.6 The 2.4m antenna for new TWSTFT link

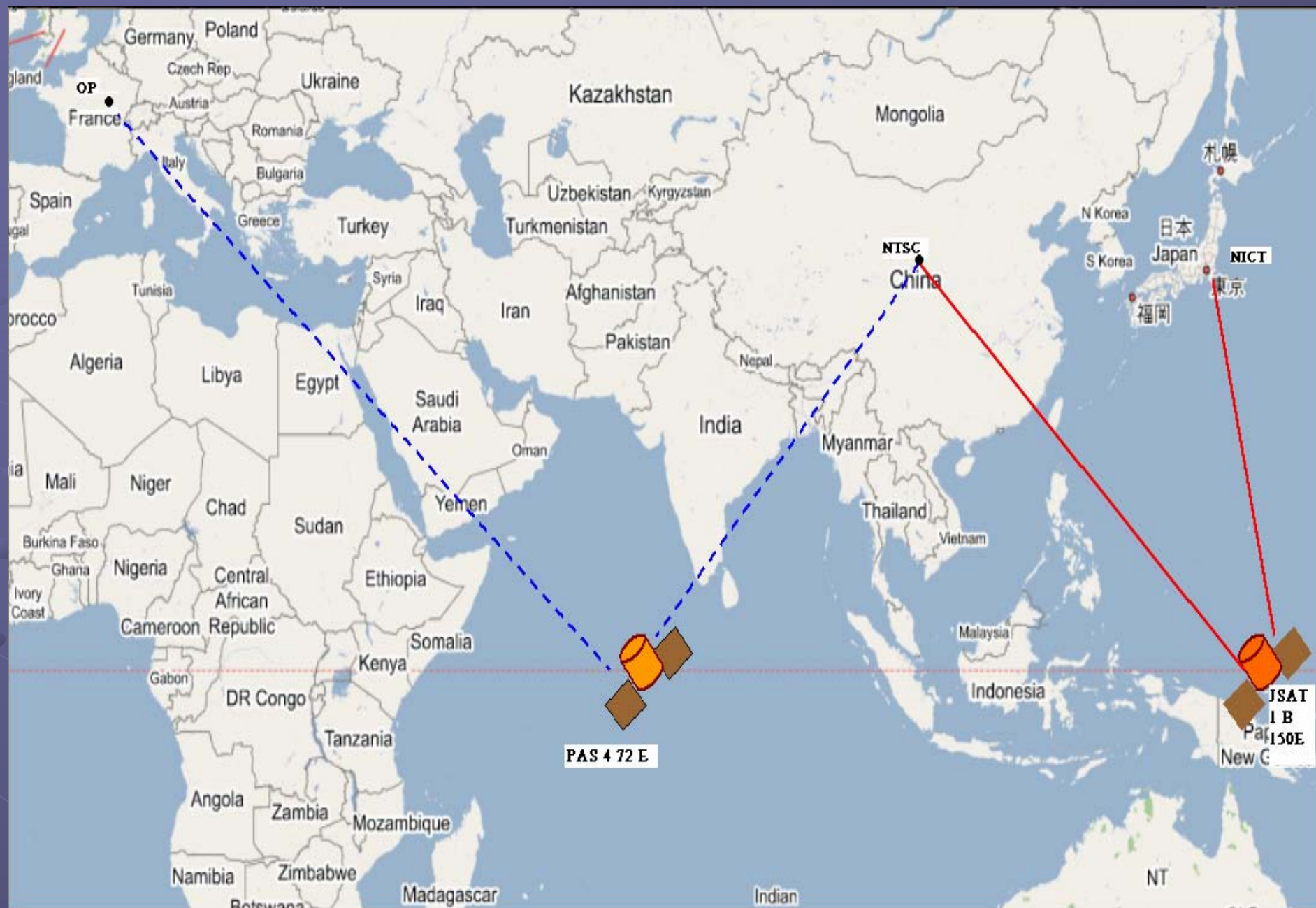


Fig.7 Timetech 3 channel Modem for new TWSTFT link

In Planning new TWSTFT link

We have two earth stations and two kind of modem for TWSTFT and we also can get fund support form Chinese Academy of Sciences. NTSC is very interesting to build TWSTFT link to Europe .

Now, NTSC and OP in France have discussed in detail and decide to set up OP—NTSC TWSTFT link via satellite PAS 4.



Satellite PAS 4

- Satellite Name
- PAS-4
- Orbital Location
- 72 degrees east longitude
- Launch Date
- August, 1995
- Mission Design Life
- 15 Years
- Polarization
- Linear

- Beacon Frequencies
 - Ku-band
 - 12.5 GHz Circular (RH/LH)
- Ku-band Payload
 - Uplink
 - 14.000 — 14.500 GHz
 - Ku-band Frequencies
 - Downlink
 - 11.450 — 11.700,
12.250 — 12.750 GHz
- Coverage
 - **Asia**, Africa, Middle East, **Europe**

Number of Transponders: 24 x 60 Watt LTWTAs with 6 spares

Transponder Bandwidth: 16 x 27 MHz, 6 x 54 MHz, 2 x 64 MHz
3 MHz guardbands (27 MHz)
6 MHz guardbands (54/64 MHz)

Polarization: Linear - Horizontal and Vertical

SFD (0.0 G/T and 0 dB attn): -89.0 dBW/m² (27 MHz Transponders)
-86.0 dBW/m² (54/64 MHz Transponders)

Input Attenuators: 0 to 15 dB in 1.0 dB steps

G/T: +2.0 to -9.0 dB/K typical for Europe/S.Africa/Asia
0.0 to -9.0 dB/K typical for Europe/Middle East/India/Asia

EIRP: 50 to 40 dBW typical for Europe/Russia
46 to 40 dBW typical for Northeast Asia
49 to 40 dBW typical for Middle East
51 to 40 dBW typical for India
55 to 44 dBW typical for Southern Africa

PAS 4 72 degrees east longitude

OP OP location:

longitude: E 02° 20' 05" .873

latitude: N 48° 50' 09" .236

altitude: 78 m

Satellite direction azimuth 105.6 degrees

elevation 4.5 degrees

NTSC location:

longitude: E 109° 13' 16" .474

Latitude : N 34° 22' 08" .852

altitude: 467 m

Satellite direction azimuth 233.4 degrees

elevation 33.9 degrees

Progress

Finished link budget for OP—NTSC TWSTFT
by PAS 4 company

NTSC:

Finished second earth station

Finished UAT test in NTSC by PAS company

Finished 3 channel modem

Finished relative equipment for new link

OP:

Preparing second earth station

Finished new modem

Finished relative equipment for new link

The new TWSTFT link between OP and NTSC
will start near the future.

Thank you

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