

TECHNICAL SPECIFICATIONS  
WORLD WIDE WEBCAST BEYOND EINSTEIN DEC 1 2005  
Documentation for partners

**CASE 1: Platform (20' to 1h show):**

Video:

- 2 or more cameras
- video mixer
- VCR deck, PC, DVD player or any other devices needed to feed source materials
- large screen for audience to follow the show

Sound:

- microphones for hosts, guests and audience (Q&A)
- PA system according to the size of local audience
- mixer with auxiliary outputs

Connection:

- Tandberg 6000. 4Mbps (uplink) network connection, with hub as close as possible to the backbone

Communication:

- intercom/clearcom with telephone interface

**CASE 2: Remote link (10-20' intervention):**

Video:

- 1 camera (optional)

Sound:

- microphone for guest
- individual speaker (computer or home sound system)

Connection:

- videoconference system supporting H.264 or H.323
- min. 512Kbps uplink network connection (ADSL or T1)

Communication:

- all partners will connect to a phone conference line (see "intercom" paragraph)
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**CASE 3: Remote interview (5' intervention):**

Connection:

- videoconference system supporting H.264 or H.323
- min. 512Kbps network connection (ADSL or T1)

Communication:

- all partners will connect to a phone conference line (see "intercom" paragraph)

**CASE 4: Viewing site (no intervention):**

Video:

- large screen for audience to follow the show

Sound:

- PA system according to the size of local audience

Connection:

- videoconference system supporting H.264 or H.323
- min. 512Kbps network connection (ADSL or T1)

or PC connecting to webcast show and displaying on large screen

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**General notes for all sites:**

**Connecting:**

A webcast is an audiovisual stream over IP. Technically, the IP packets are not synchronized with the source timing, and arrive to the viewer with a variable buffering delay (around 20 sec.). This means that if you watch the webcast through a computer you are actually seeing what happened 20 seconds earlier. This can be a problem if you are interacting with the studio via videoconference. Here is how we'll get around it:

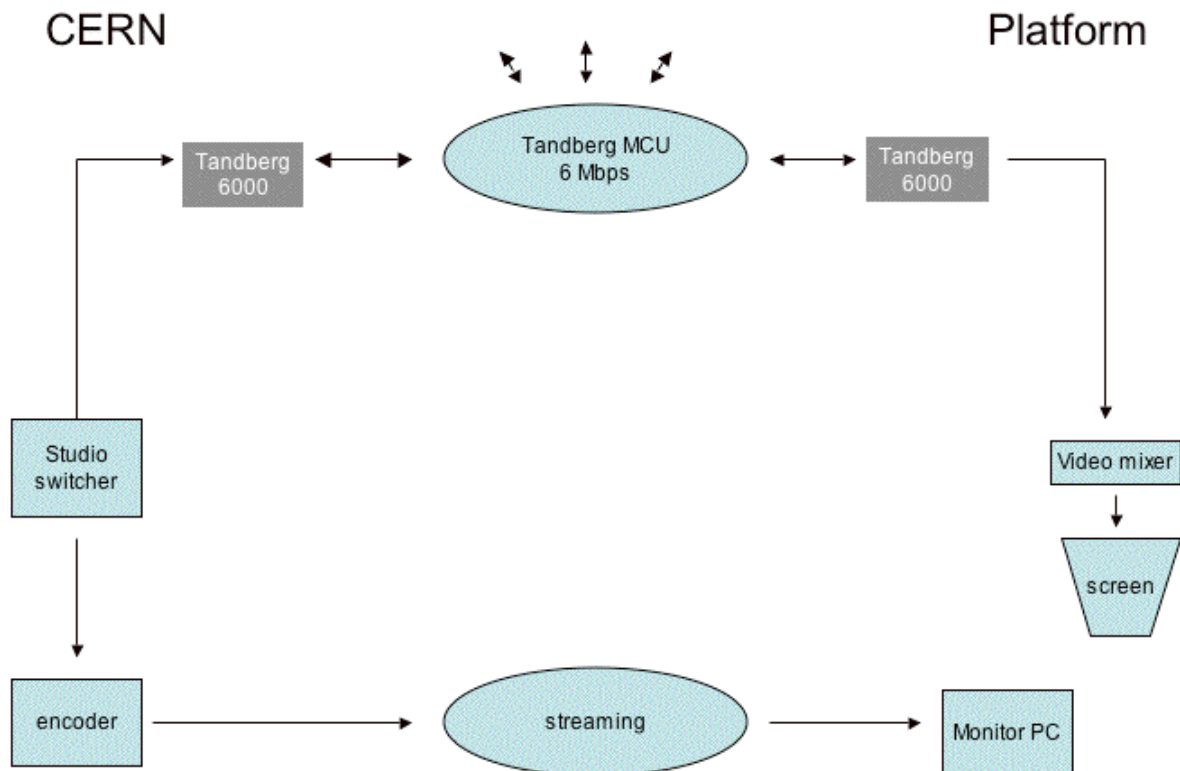
The CERN central studio will operate 3 different simultaneous streams:

- 1) the encoded signal, which will be sent to the streamer for ordinary webcast (Realmedia, WinMedia)
- 2) a high speed MCU based videoconference ring (fast ring), used to connect *platform studios* to CERN via high speed systems (Tandberg 6000), and activated some time before their on air time
- 3) a low speed Codian based videoconference ring joining *remote links*. (640kbps).

**Main platform studios** (CERN, Fermilab (Chicago), the Exploratorium (SF), Imperial College (London), Bloomfield Museum (Jerusalem), NSEC (Taipei)) will be connected through the fast ring. This means that they are guaranteed a min. 1Mbps link, which is necessary to have a good quality signal for webcast encoding. These studios are contributing a 20-90 mins show, so they need to broadcast at a near TV quality. The studios will be connect a few hours before their intervention, in order to allow us to perform network tests, and to allow them to watch the show in real time. Some time after their intervention, these studios may be disconnected, in order to leave bandwidth for the next intervenants. In fact, the MCU bandwidth (6 Mbps) has to be shared between the connected sites, so the less there are connected, the higher the bandwidth.

**Platform studios, please let us know the time slots you wish to be connected**

The following scheme is a connectivity diagram for a main platform studio.



**Remote links** sites will connect over IP, with any H.323 compatible equipment (Videoconference system) through a Codian MCU system located at CERN. Basically this is a videoconference concentrator that allows

several connections to see each other. The MCU will be controlled centrally at CERN. We will call your system sometime before your intervention. You may log out when you wish to quit. If you are interested in following the show hours before your intervention, please let us know when you wish to be called.

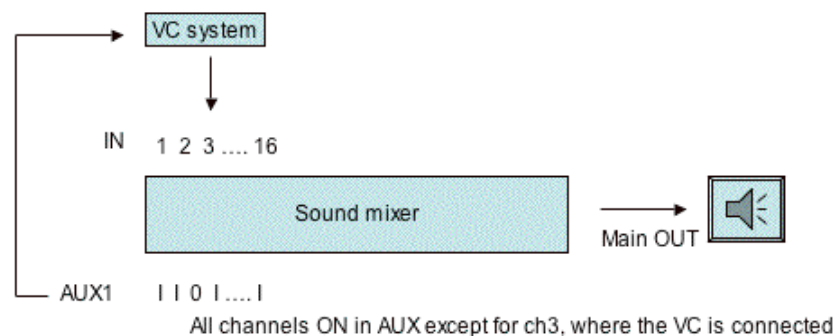
Non interacting platforms (classrooms or science centres with local audience) can also connect to this MCU system for a better quality signal than the standard webcast stream.

Sites featuring a sound mixer, please read the paragraph below.

### Audio:

Platforms must imperatively connect their VC system with a “mix minus” configuration. That means that your VC system’s OUT connector is attached to an AUX line configured in post fade, with all channels ON, EXCEPT the VC system itself. This is essential to avoid feedback loops. Please note that if you use a sound mixer this is **IMPERATIVE**. Note as well that the normal echo cancellation of your VC system will not stop an endless feedback loop if you have a sound mixer OUT connector connected to the IN of your VC system, unless you send back a “mix minus” signal. Failure to do so usually leads to a catastrophic connection with no audible sound!

**If you don’t understand this point, please ask us for more guidance.**



### Intercom:

Studio switchover will be synchronized via phone conference. All platforms and interview sites can call a single phone conference number. The CERN local clearcom system will be interfaced to that phone conference, so you may hear all that is going on behind the scenes in the CERN studio. All inter studio communication will go through that channel. This makes it easy for platforms and interviewees to reach the CERN director for handshake or problem reporting.

Before your intervention, or any time you wish, call +41.22.7677000 and ask the operator for “World Wide Webcast”. You will be hearing the in studio communications at CERN and you will be talking to the show directors, who will prompt you in when it is your time on air.

Note that at CERN we will have 2 teams, alternating every 90 minutes. One of these teams will be speaking English, the other French. This is only the Intercom language (the show is always in English). The French team involves some local operators (camera, sound etc.) who do not speak English, however the Directors always do. Don’t be afraid to break in in English and announce your presence on the line when you connect. It is important that you are there at least 10 mins before your show and that you notify the Director.

**If you don’t do so, the Director will think that you are not ready and will not pass the link to you at the programmed time.**

**Technical contact: [silvano.de.gennaro@cern.ch](mailto:silvano.de.gennaro@cern.ch)**