2-2-3 Basic Design Drawings

Fig. 2-2-6 Project Site

(1/2) Layout of New News Division (ex-RTF building 1st Floor)

(2/2) Layout of New News Division (ex-RTF building 2nd Floor)

Fig. 2-2-7 1 to 1 Editing System (A)

(1/3) Video and Control Signal Connection Diagram

(2/3) External View of Console

(3/3) Layout of Equipment

Fig. 2-2-8 1 to 1 Editing System (B)

(1/3) Video and Control Signal Connection Diagram

(2/3) External View of Console

(3/3) Layout of Equipment

Fig. 2-2-9 A/B Roll Editing System-1

(1/4) Video and Control Signal Connection Diagram

(2/4) Audio Signal Connection Diagram

(3/4) External View of Console

(4/4) Layout of Equipment

Fig. 2-2-10 A/B Roll Editing System-2

(1/2) Video and Control Signal Connection Diagram

(2/2) Layout of Equipment

Fig. 2-2-11 Non-Linear Editing System

(1/3) Connection Diagram

(2/3) External View of Console

(3/3) Layout of Equipment

Fig. 2-2-12 On-air VTR System in Continuity Studio 1 and 2

(1/3) Connection Diagram

(2/3) External View of Rack (Continuity Studio-1)

(3/3) External View of Rack (Continuity Studio-2)

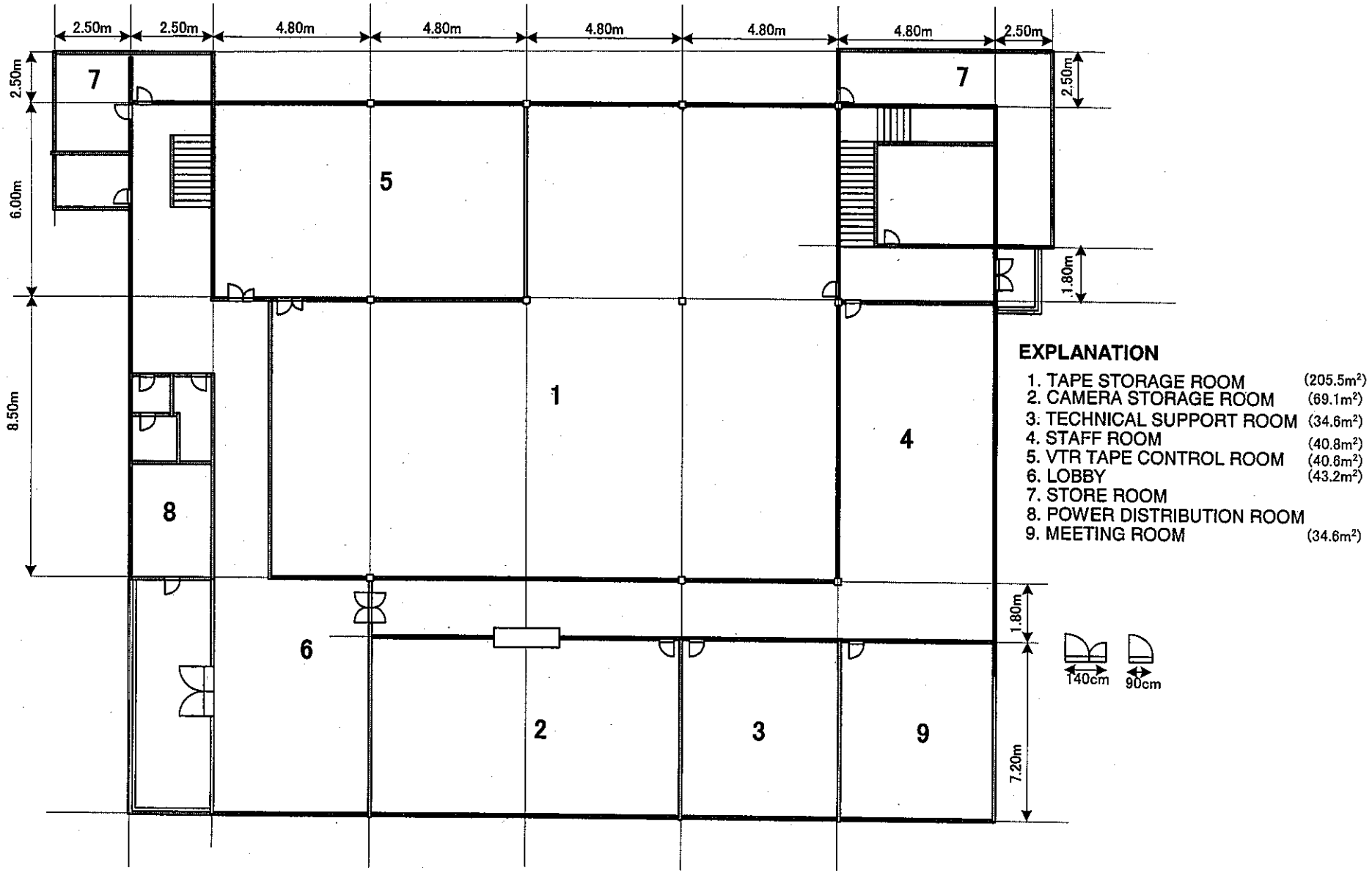


Fig. 2-2-6 (1/2) Project Site, Layout of New News Division (ex-RTF Building 1st Floor)

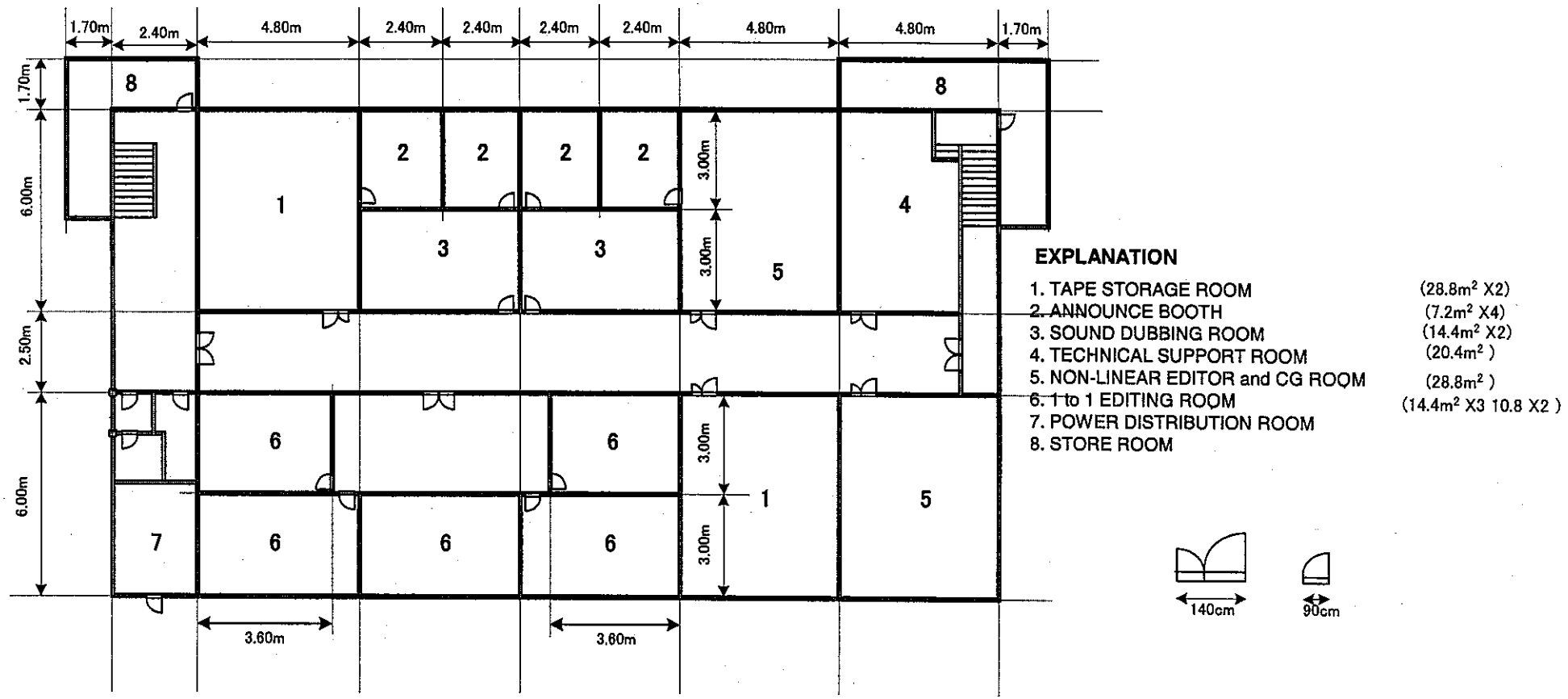


Fig. 2-2-6 (2/2) Project Site, Layout of New News Division (ex-RTF Building 2nd Floor)

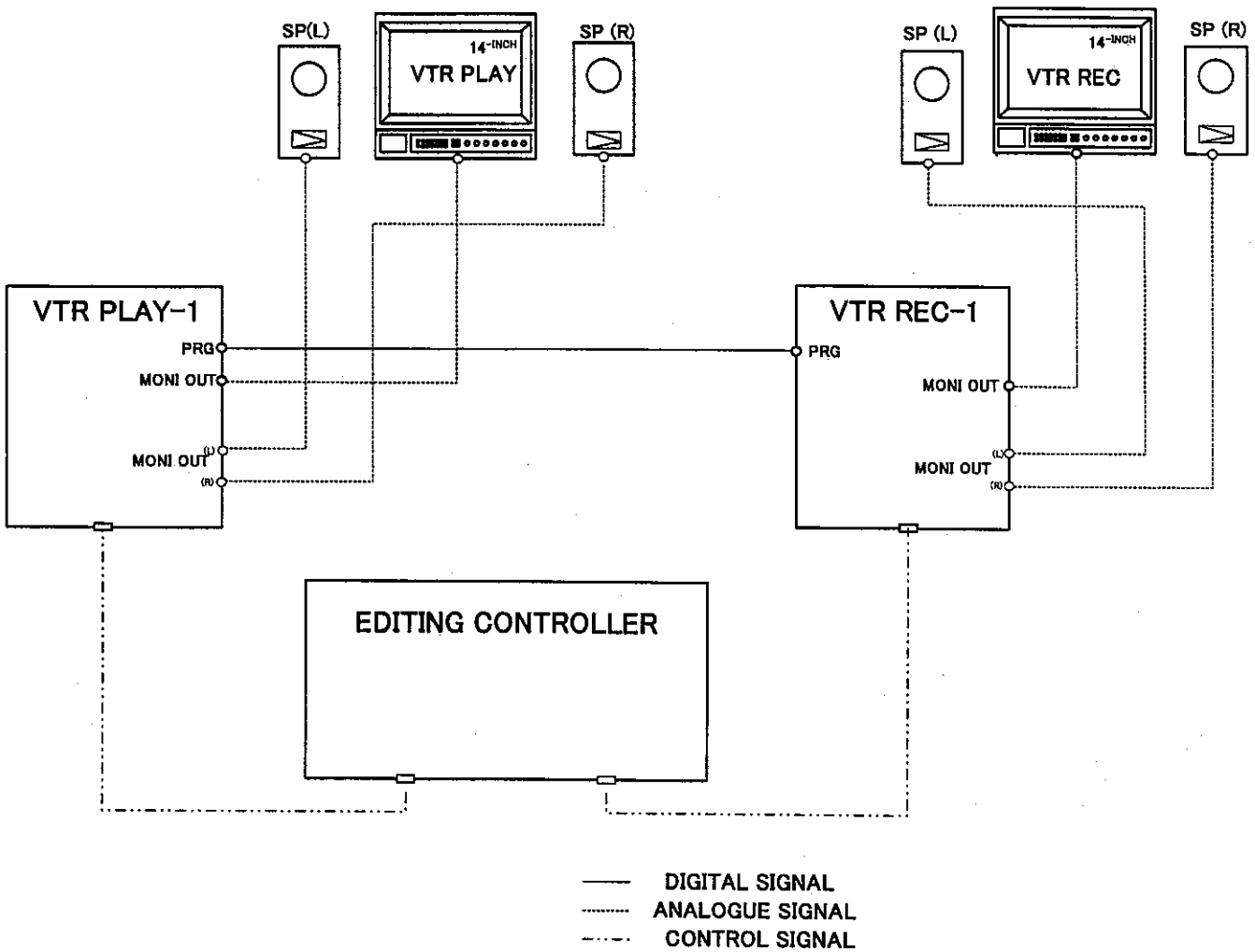


Fig. 2-2-7 (1/3) 1 to 1 Editing System (A) , Video and Control Signal Connection Diagram

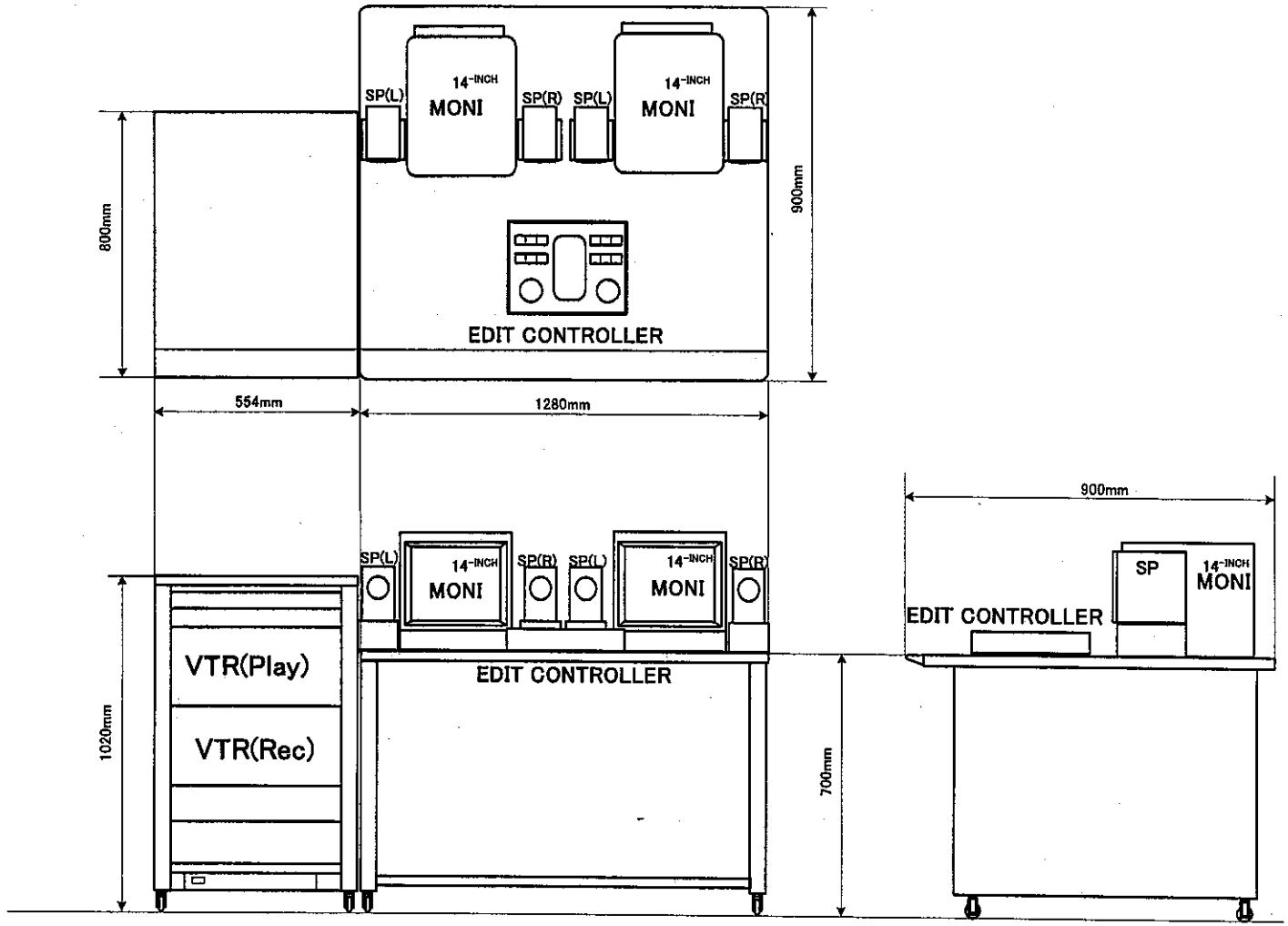
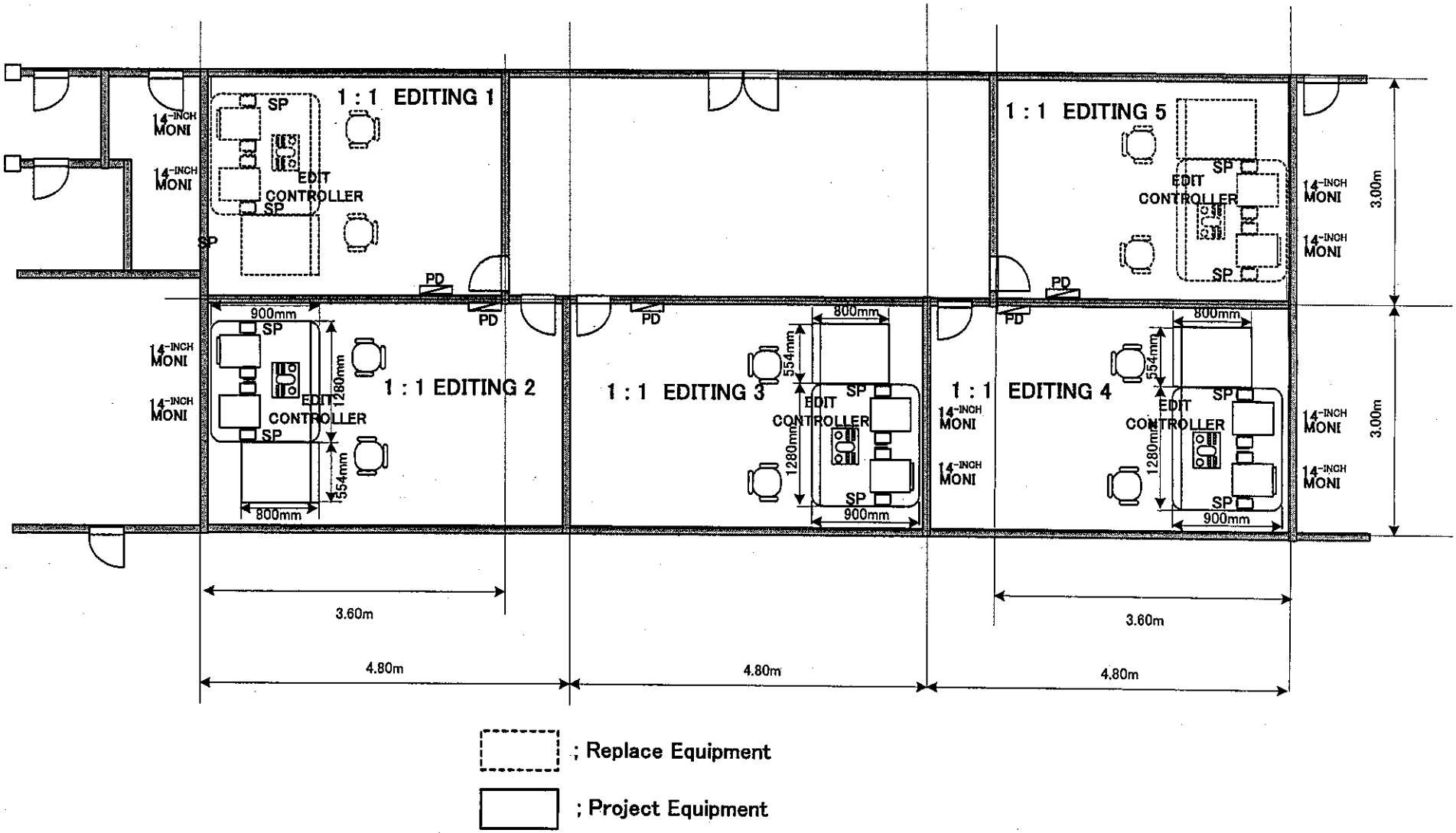


Fig. 2-2-7 (2/3) 1 to 1 Editing System (A) , External View of Console



Fi. 2-2-7 (3/3) 1 to 1 Editing System (A), Layout of Equipment

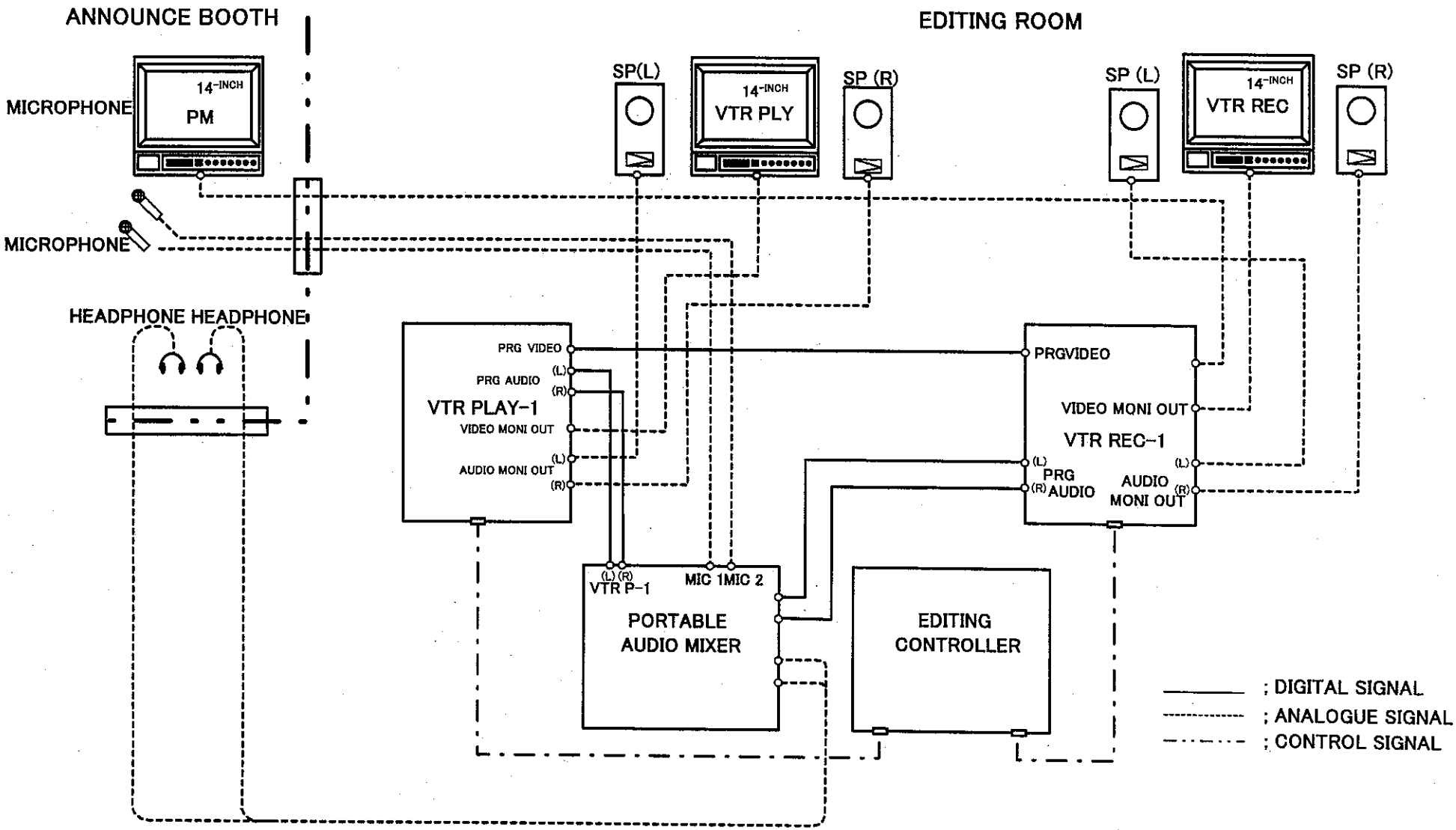


Fig. 2-2-8 (1/3) 1 to 1 Editing System (B) , Video and Control Signal Connection Diagram

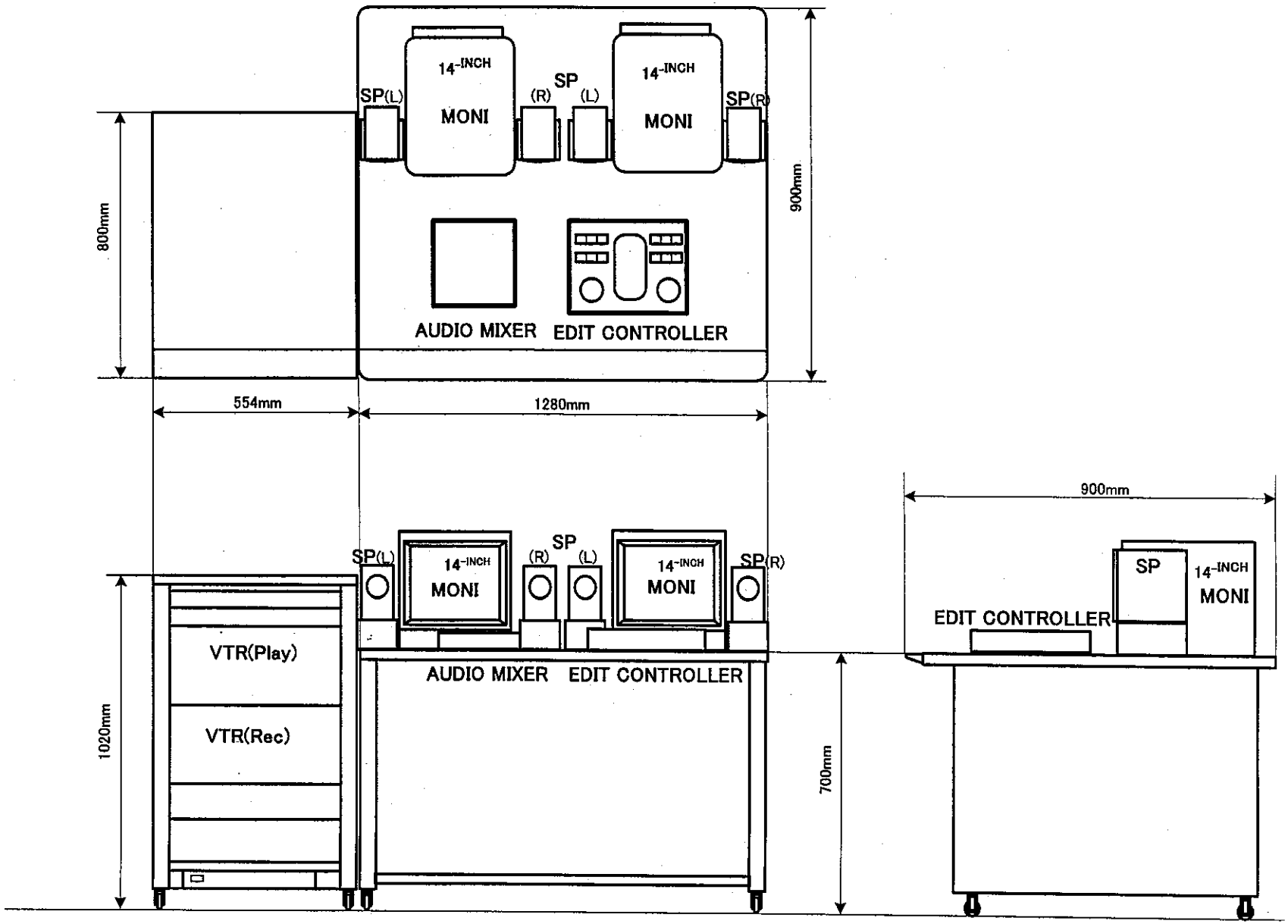


Fig. 2-2-8 (2/3) 1 to 1 Editing System (B) , External View of Console

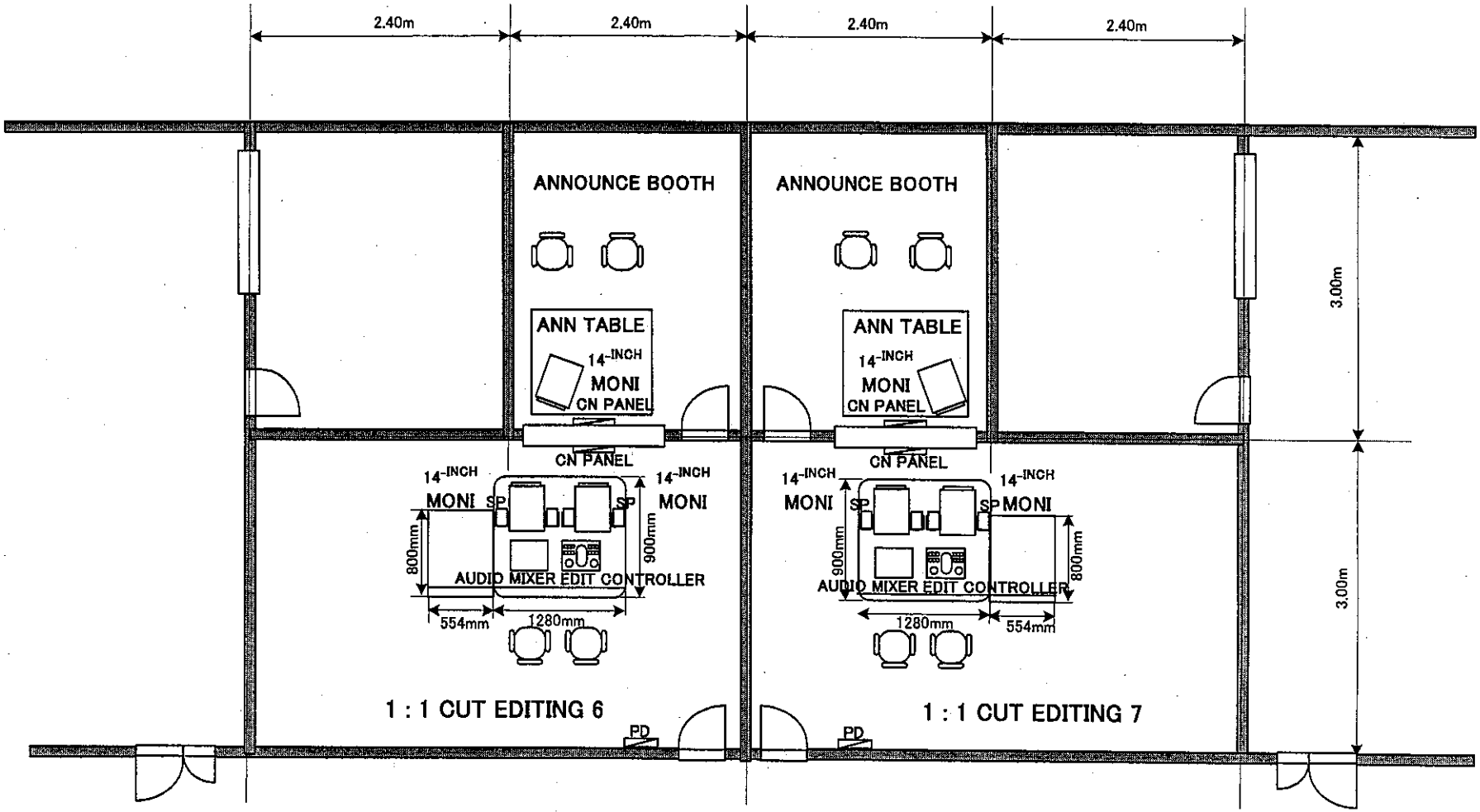


Fig. 2-2-8 (3/3) 1 to 1 Editing System (B), Layout of Equipment

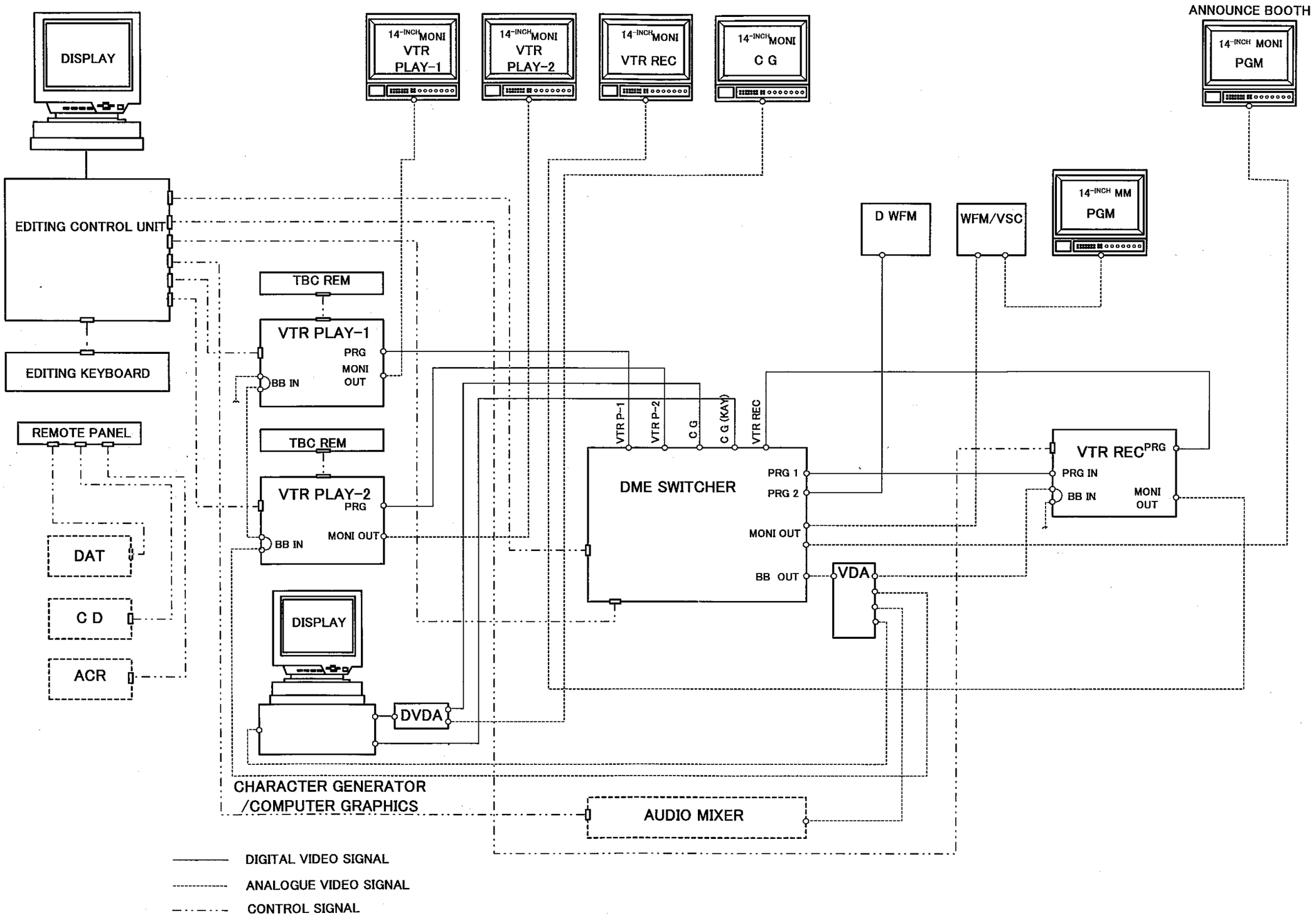


Fig. 2-2-9 (1/4) A/B Roll Editing System-1, Video and Control Signal Connection Diagram

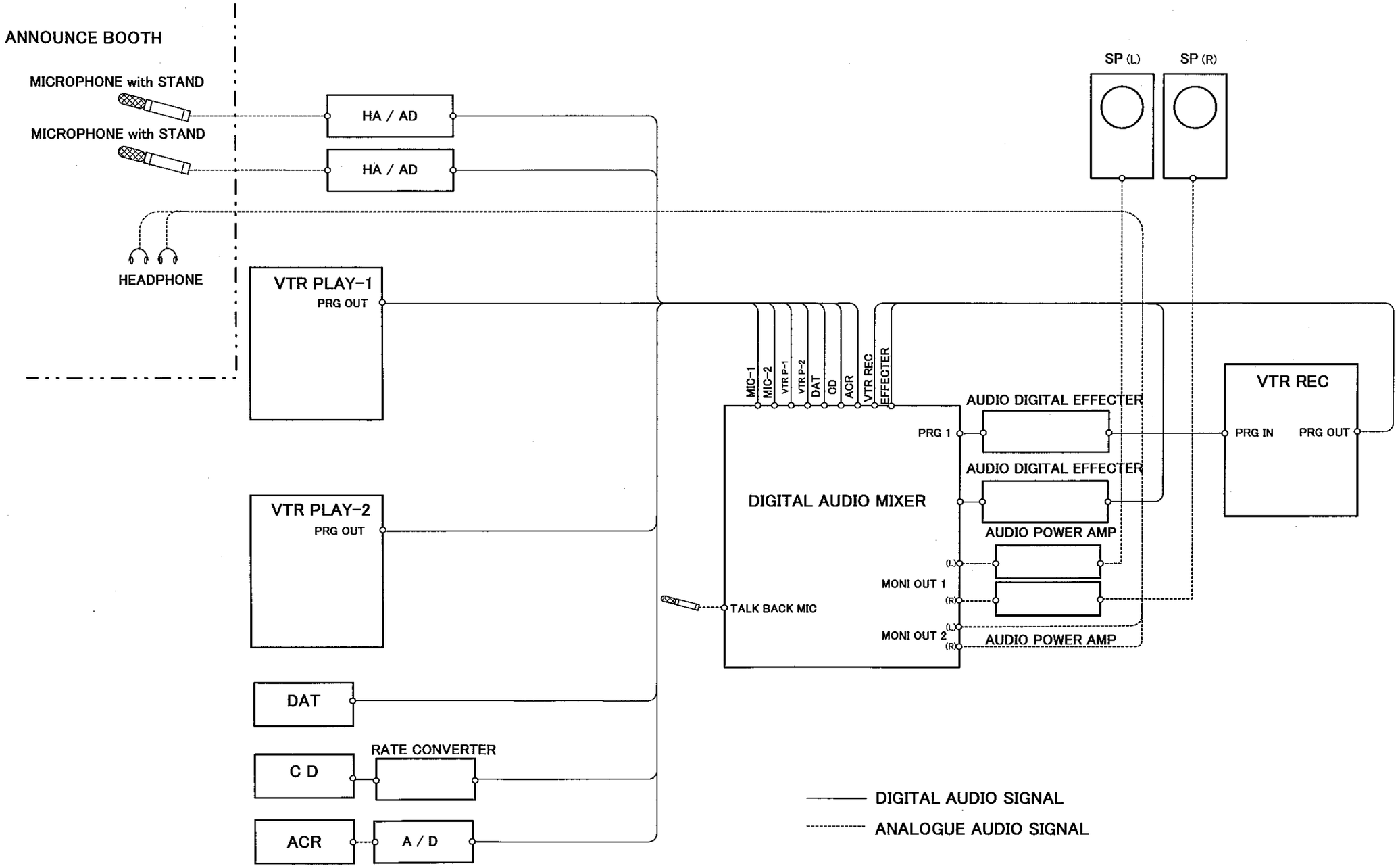


Fig. 2-2-9 (2/4) A/B Roll Editing System-1, Audio Signal Connection Diagram

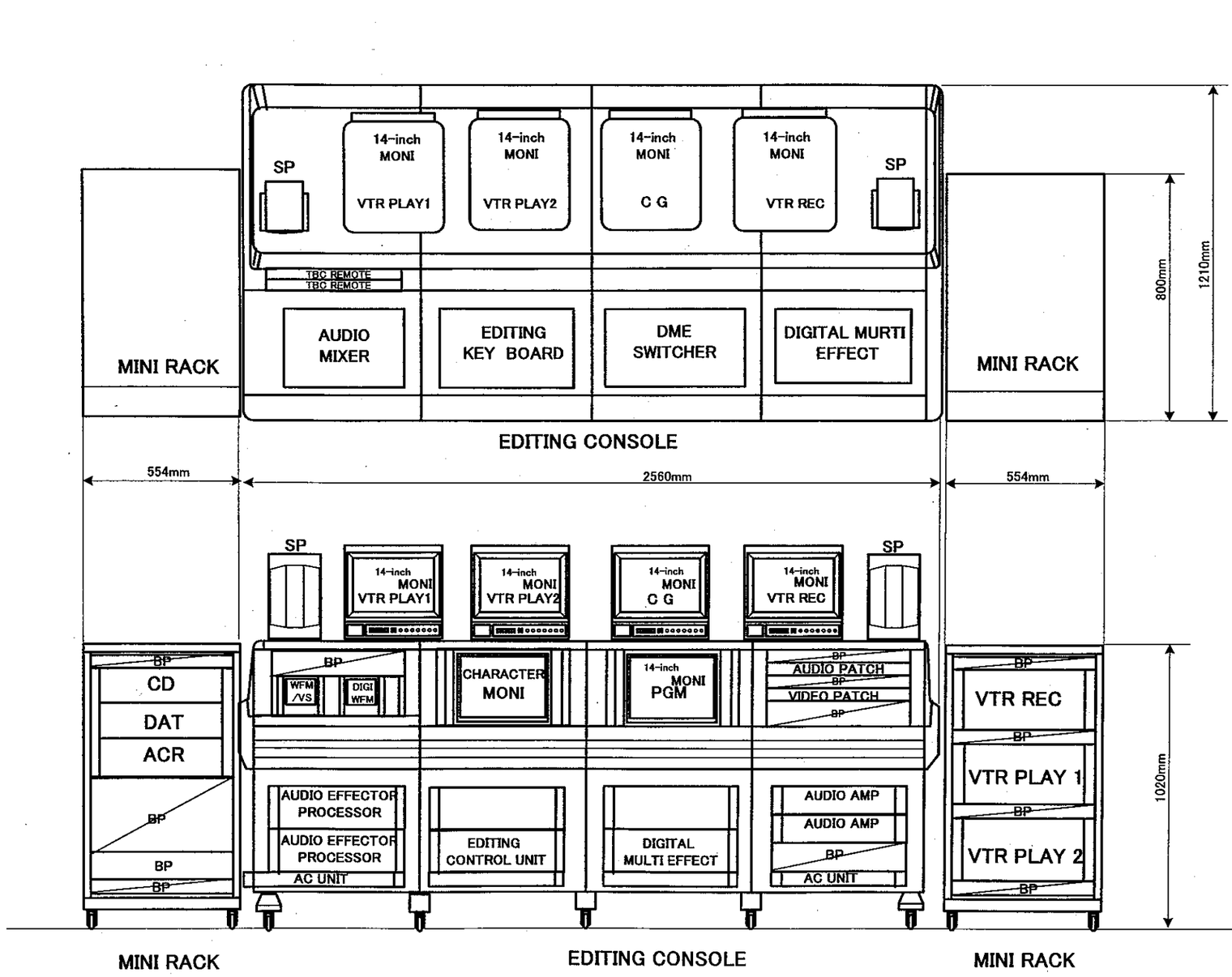


Fig. 2-2-9 (3/4) A/B Roll Editing System-1, External View of Console

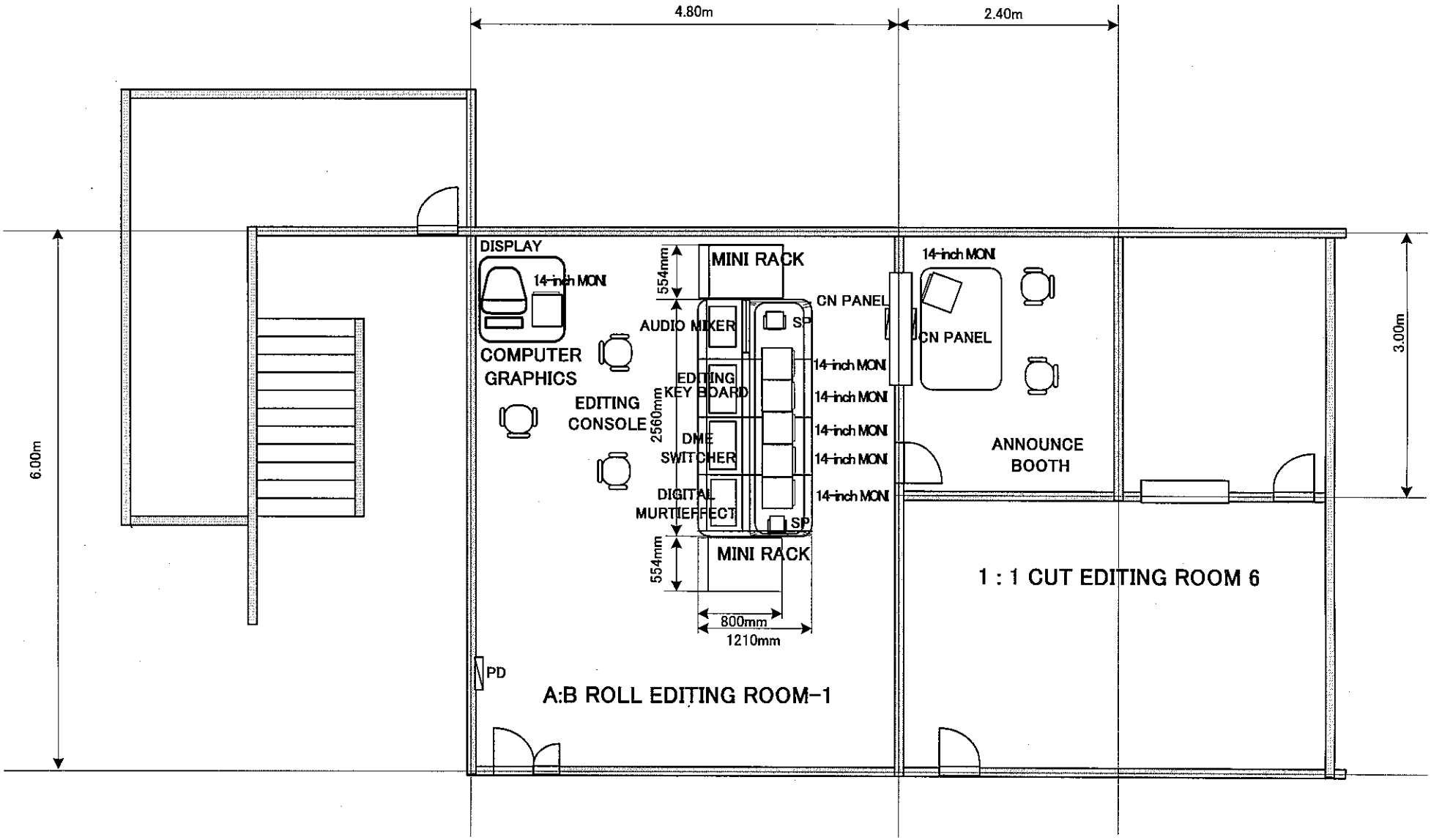


Fig. 2-2-9 (4/4) A/B Roll Editing System-1, Layout of Equipment

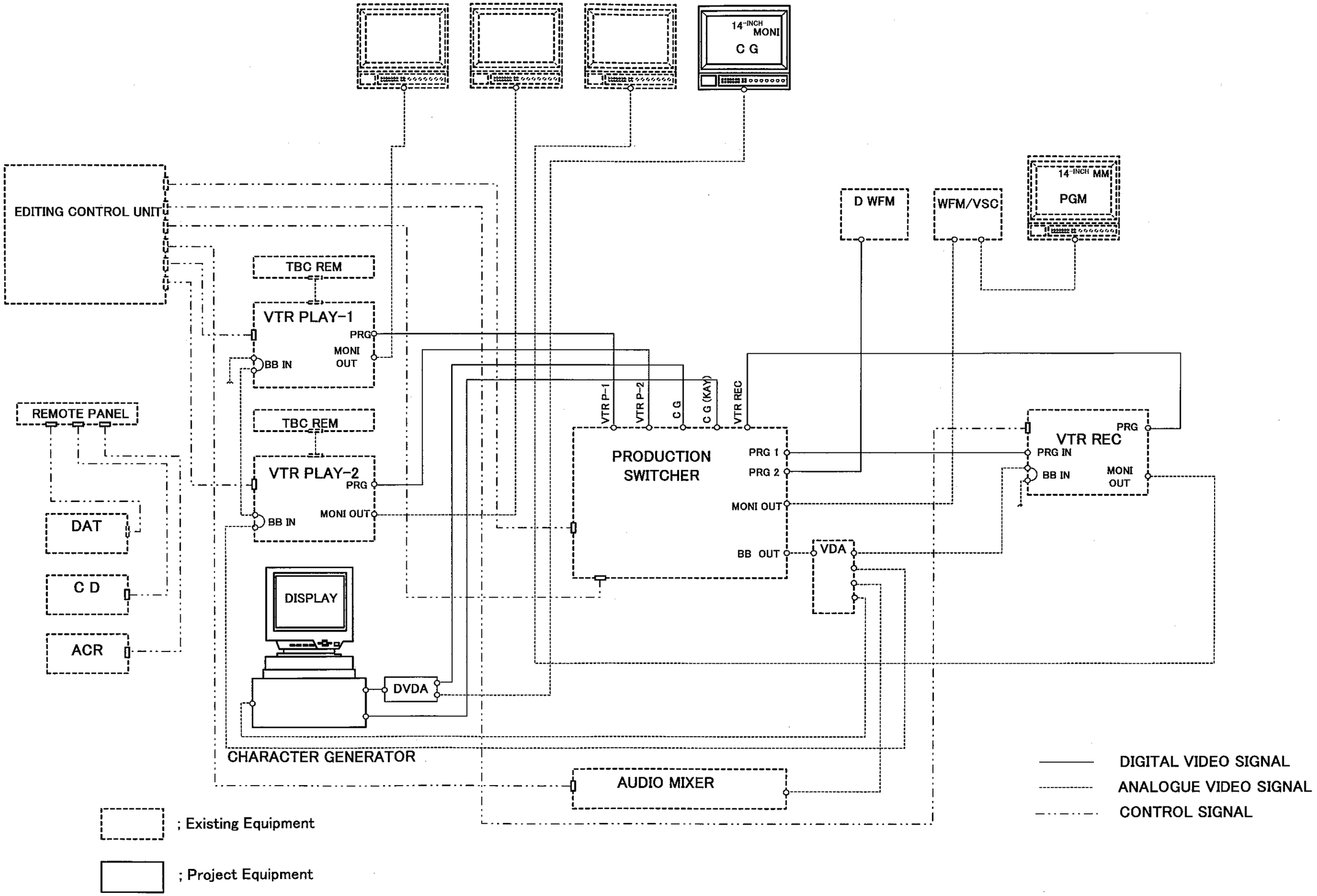


Fig. 2-2-10 (1/2) A/B Roll Editing System-2, Video and Control Signal Connection Diagram

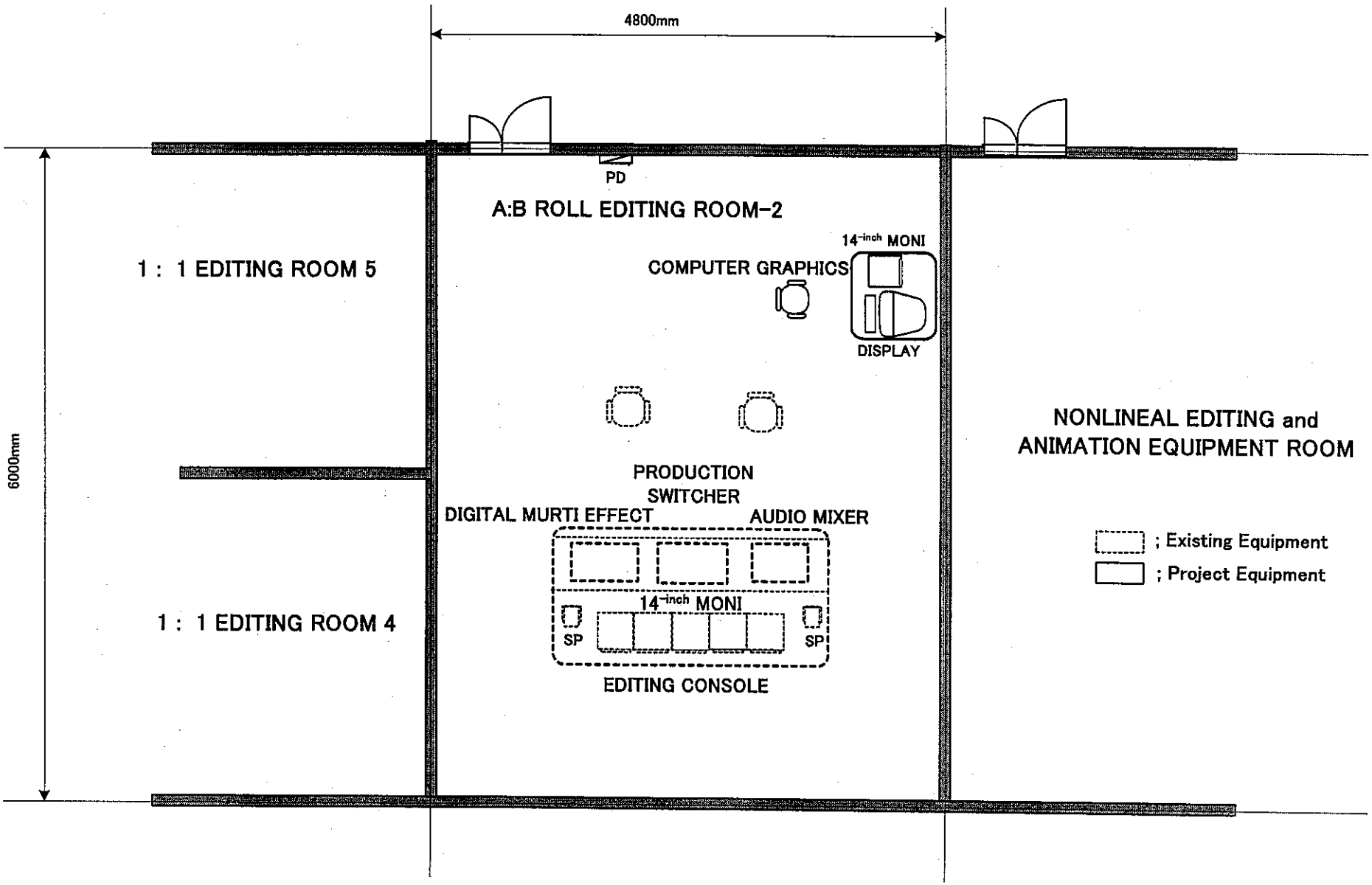


Fig. 2-2-10 (2/2) A/B Roll Editing System-2, Layout of Equipment

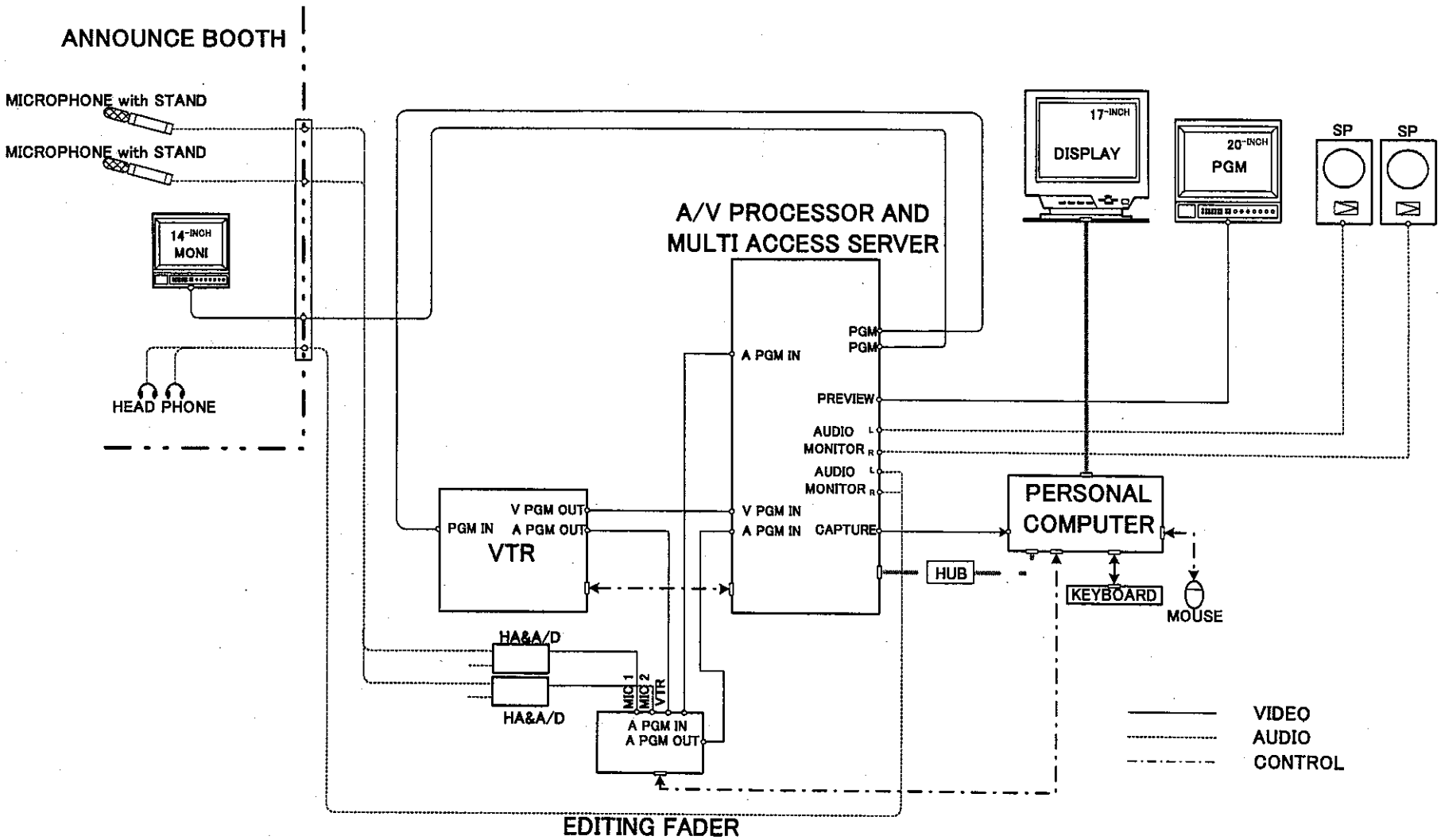


Fig. 2-2-11 (1/3) Non-Linear Editing System, Connection Diagram

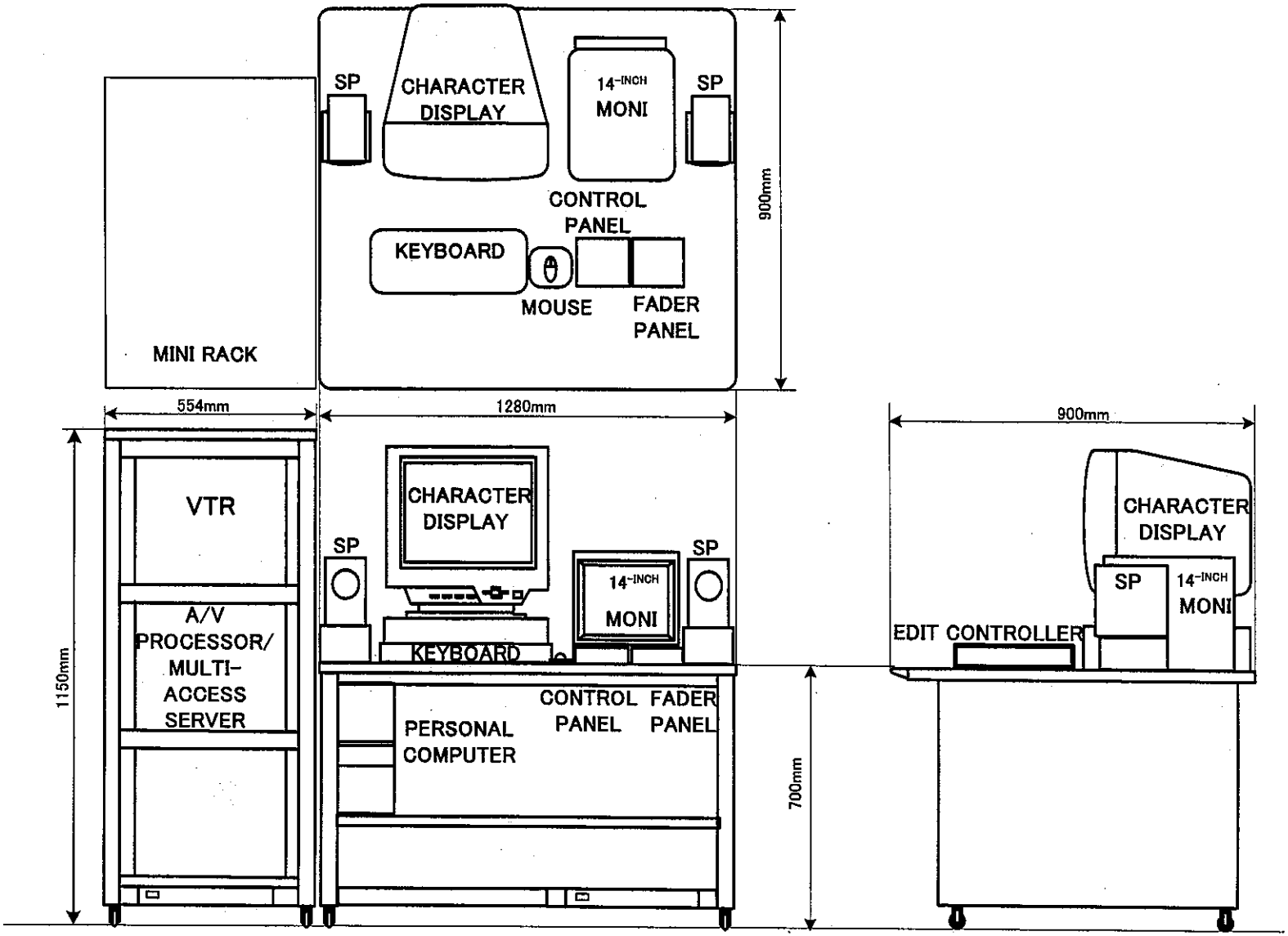


Fig. 2-2-11 (2/3) Non-Linear Editing System , External View of Console

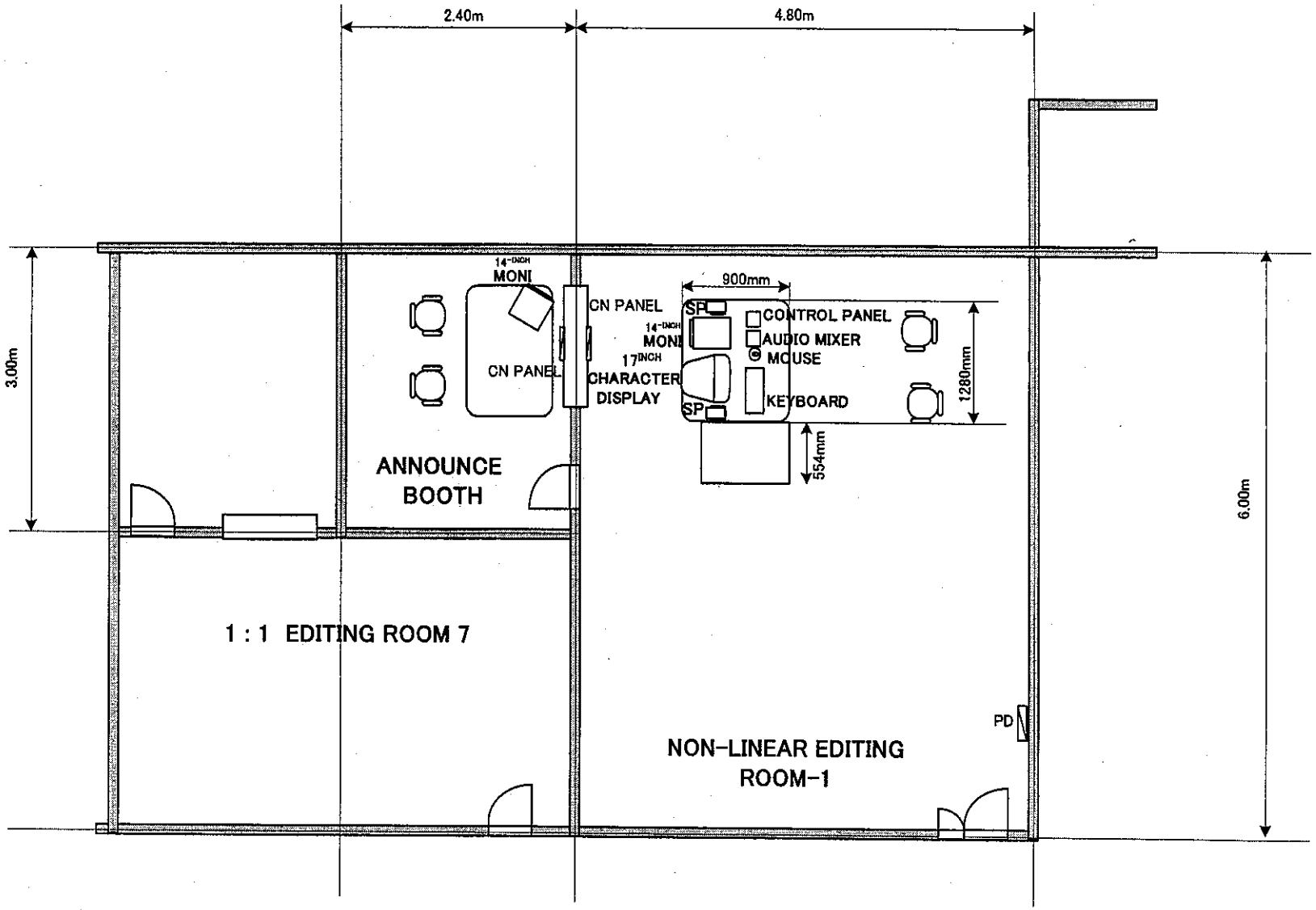


Fig. 2-2-11 (3/3) Non-Linear Editing System, Layout of Equipment

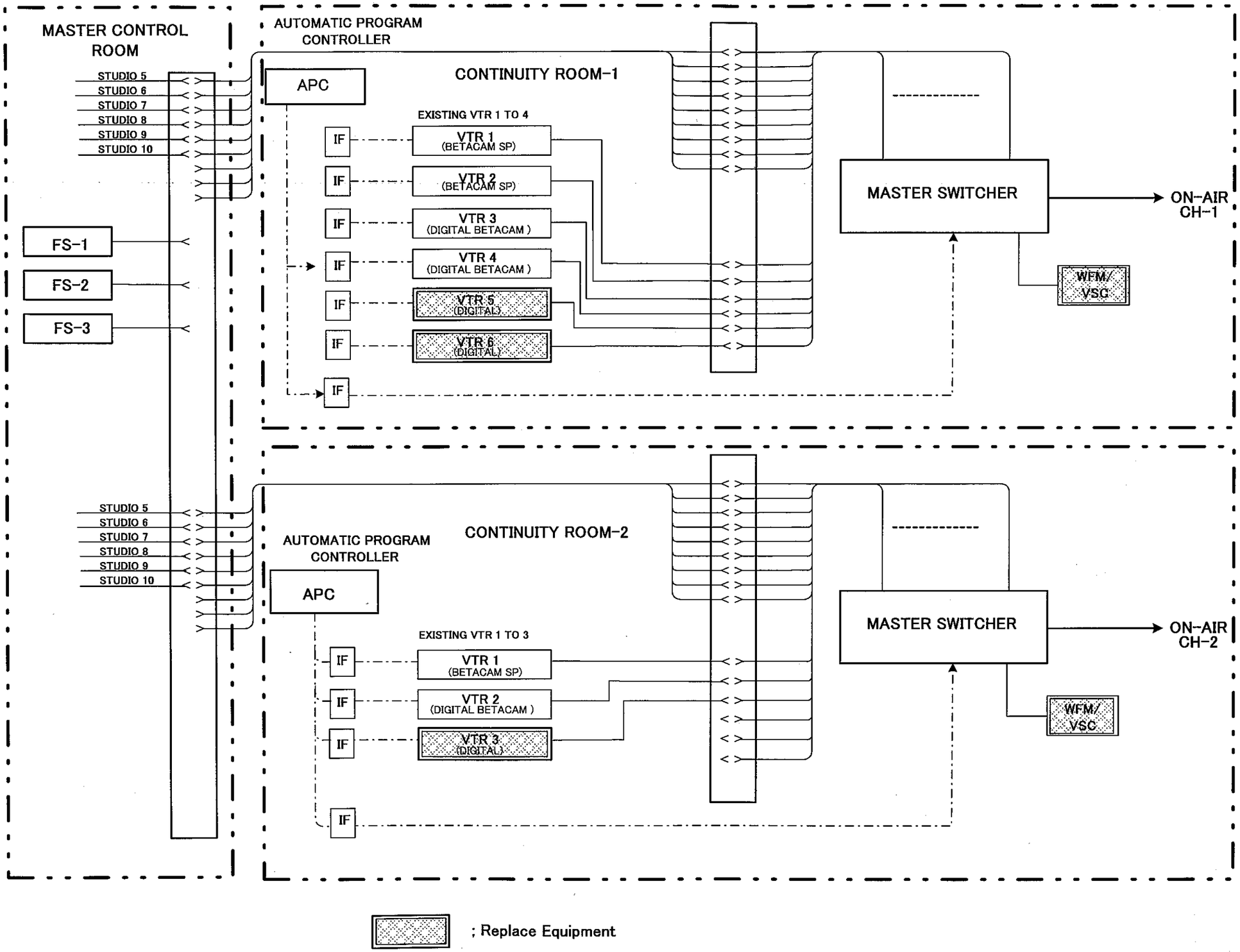
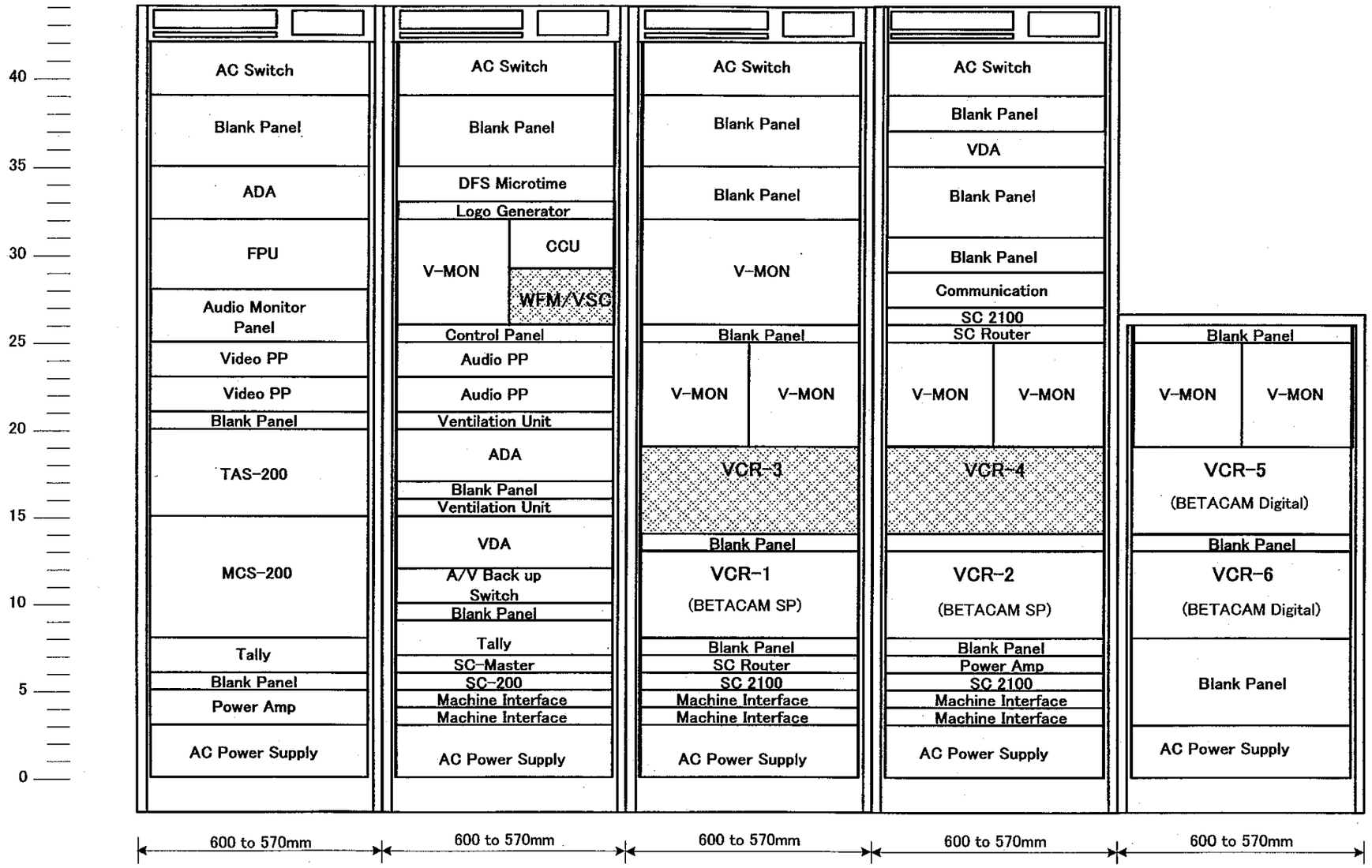


Fig. 2-2-12 (1/3) On-air VTR System in Continuity Studio 1 and 2 , Connection Diagram



DEPTH:730mm

; Replace Equipment

Fig. 2-2-12 (2/3) On-air VTR System in Continuity Studio 1 and 2, External View of Rack (Continuity Studio-1)

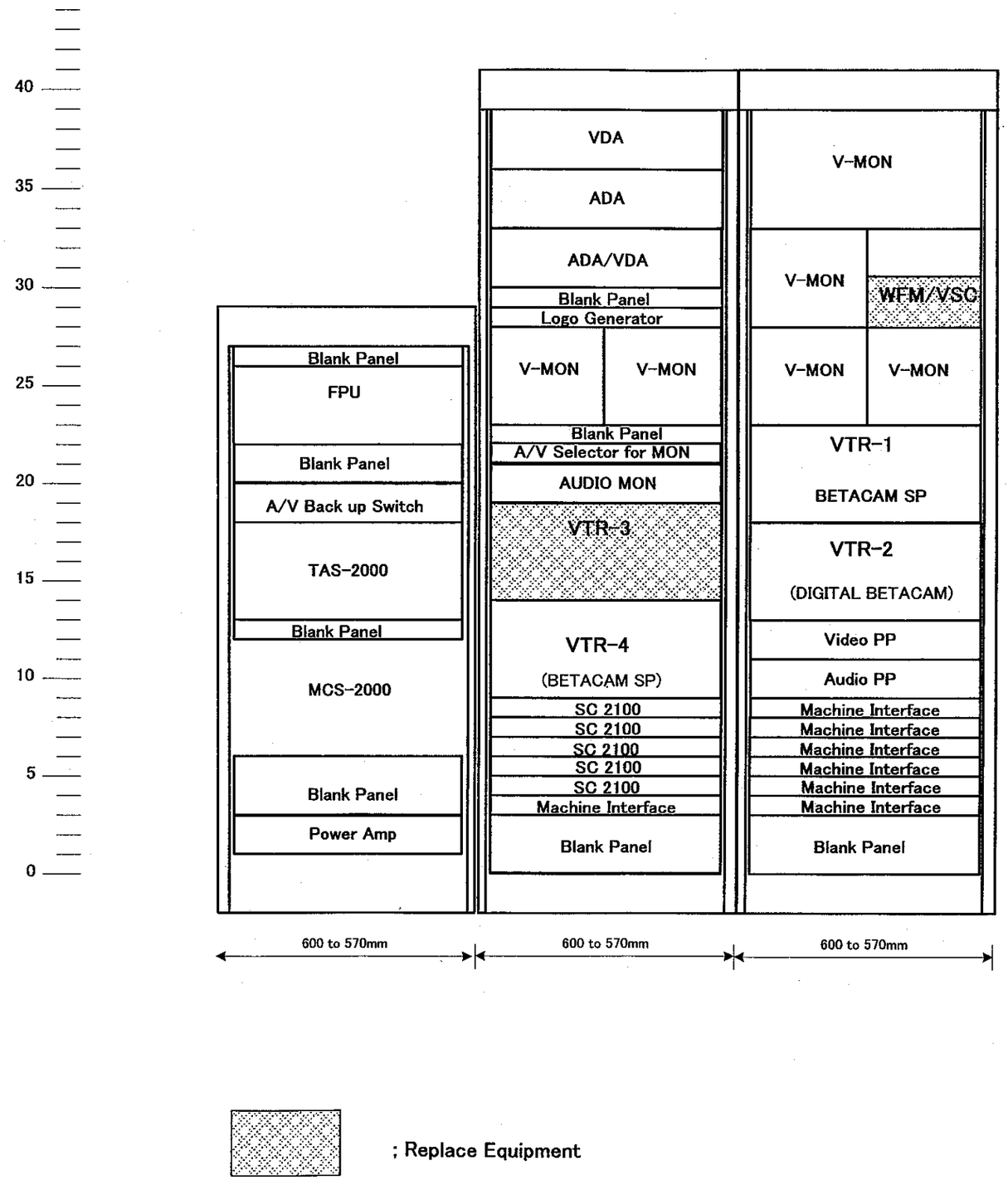


Fig 2-2-12 (3/3) On-air VTR System in Continuity Studio 1 and 2 , External View of Rack (Continuity Studio-2)

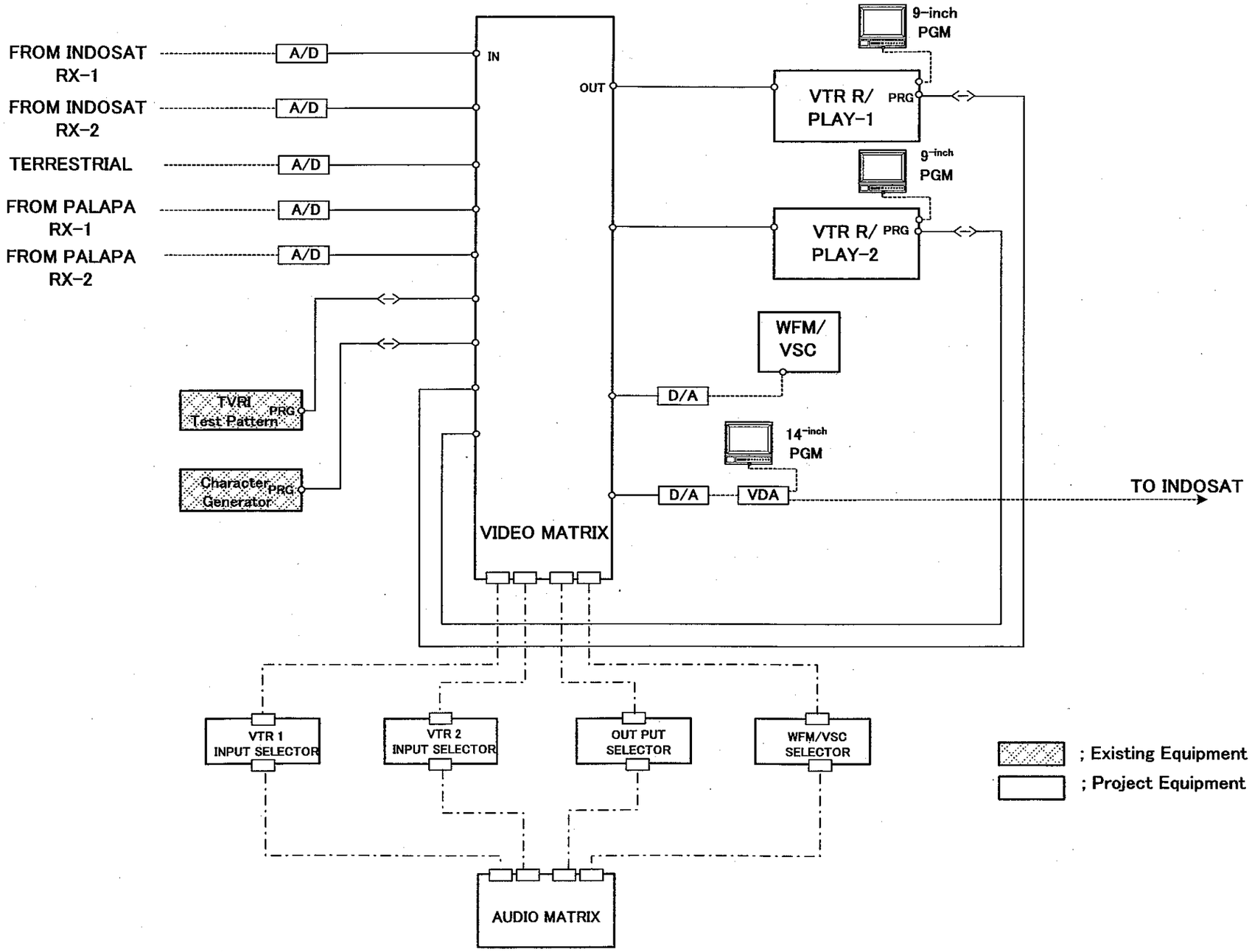


Fig. 2-2-13 (1/3) Program Exchange VTR System, Video and Control Signal Connection Diagram

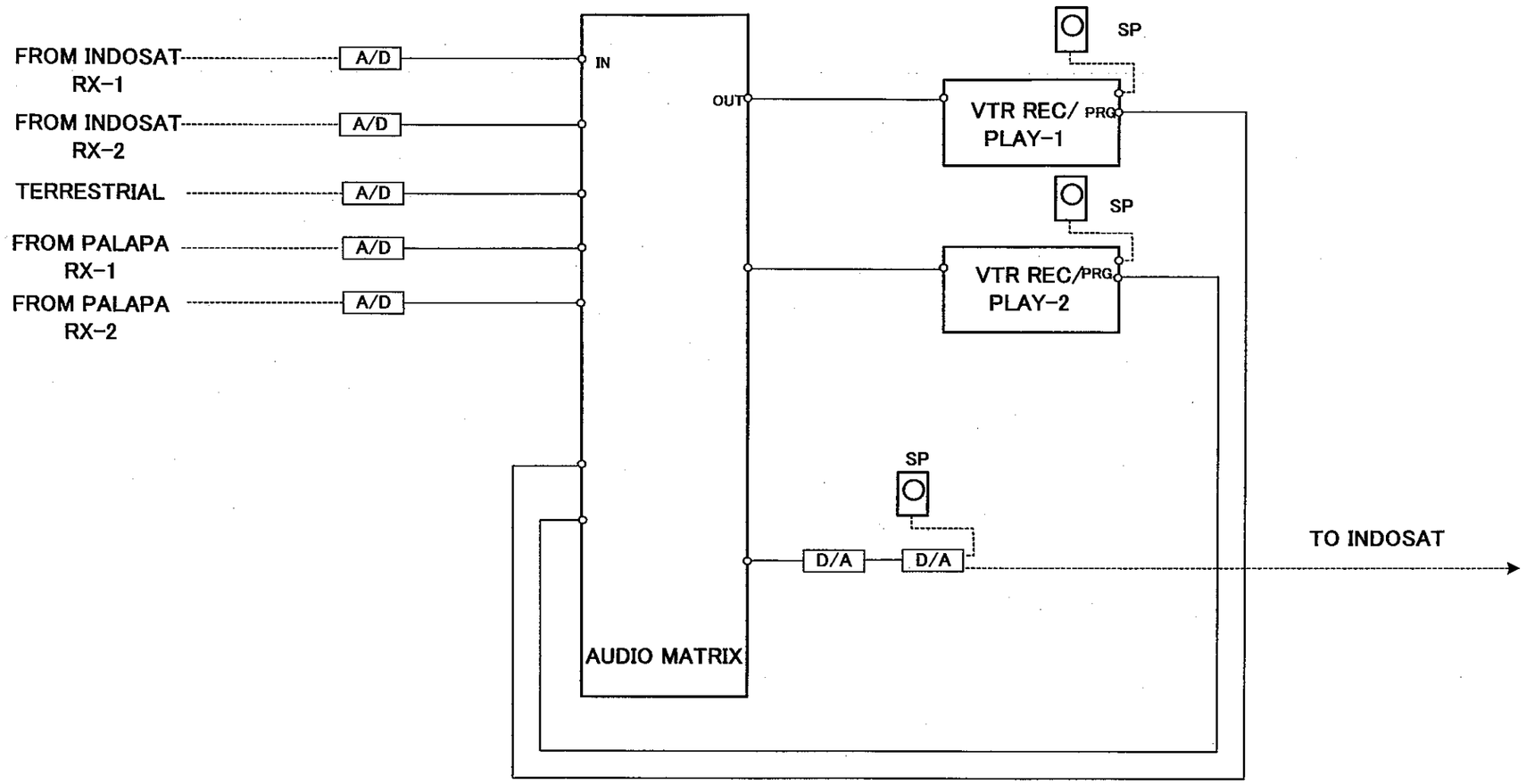


Fig. 2-2-13 (2/3) Program Exchange VTR System, Audio Signal Connection Diagram

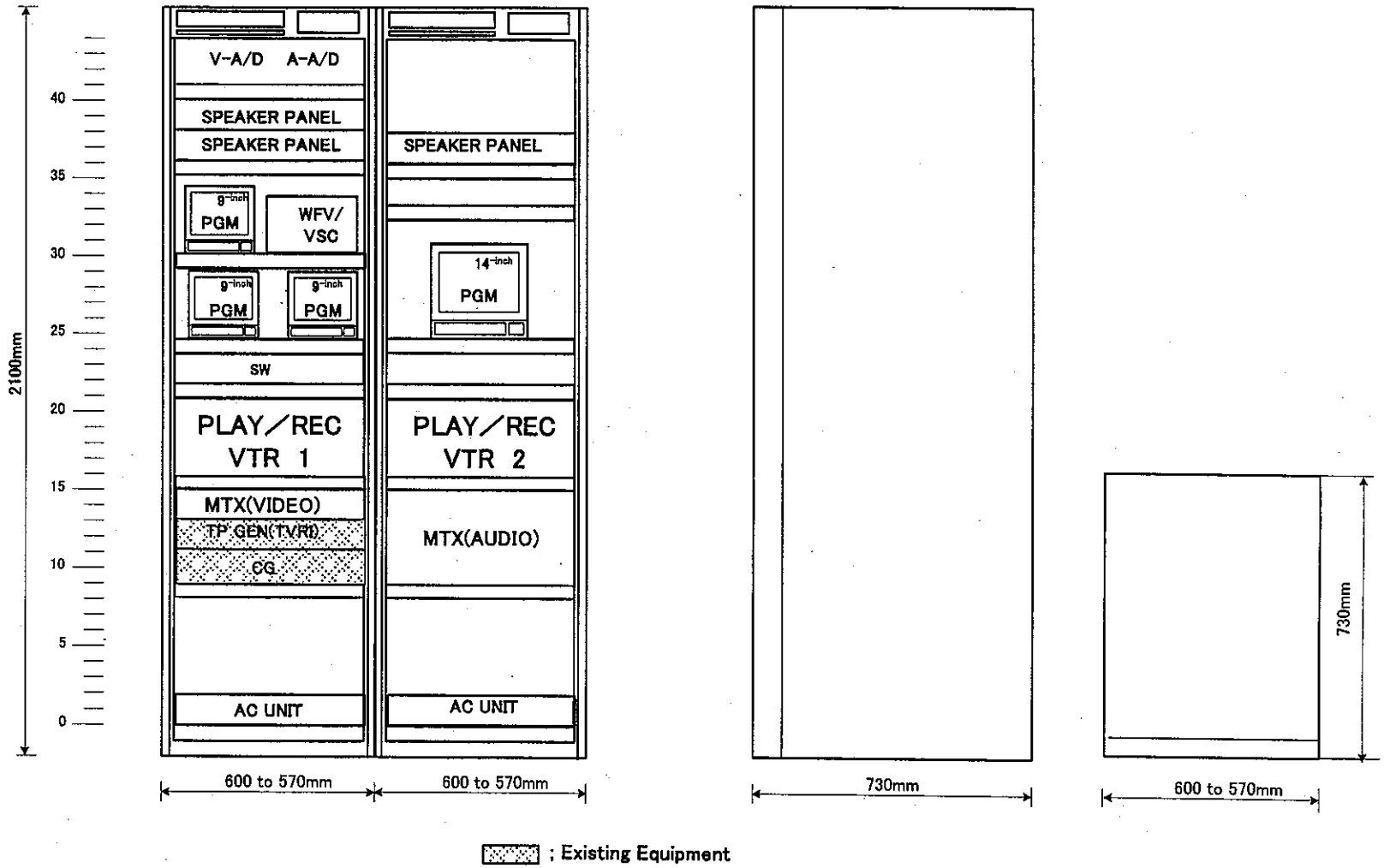


Fig. 2-2-13 (3/3) Program Exchange VTR System, External View of Rack

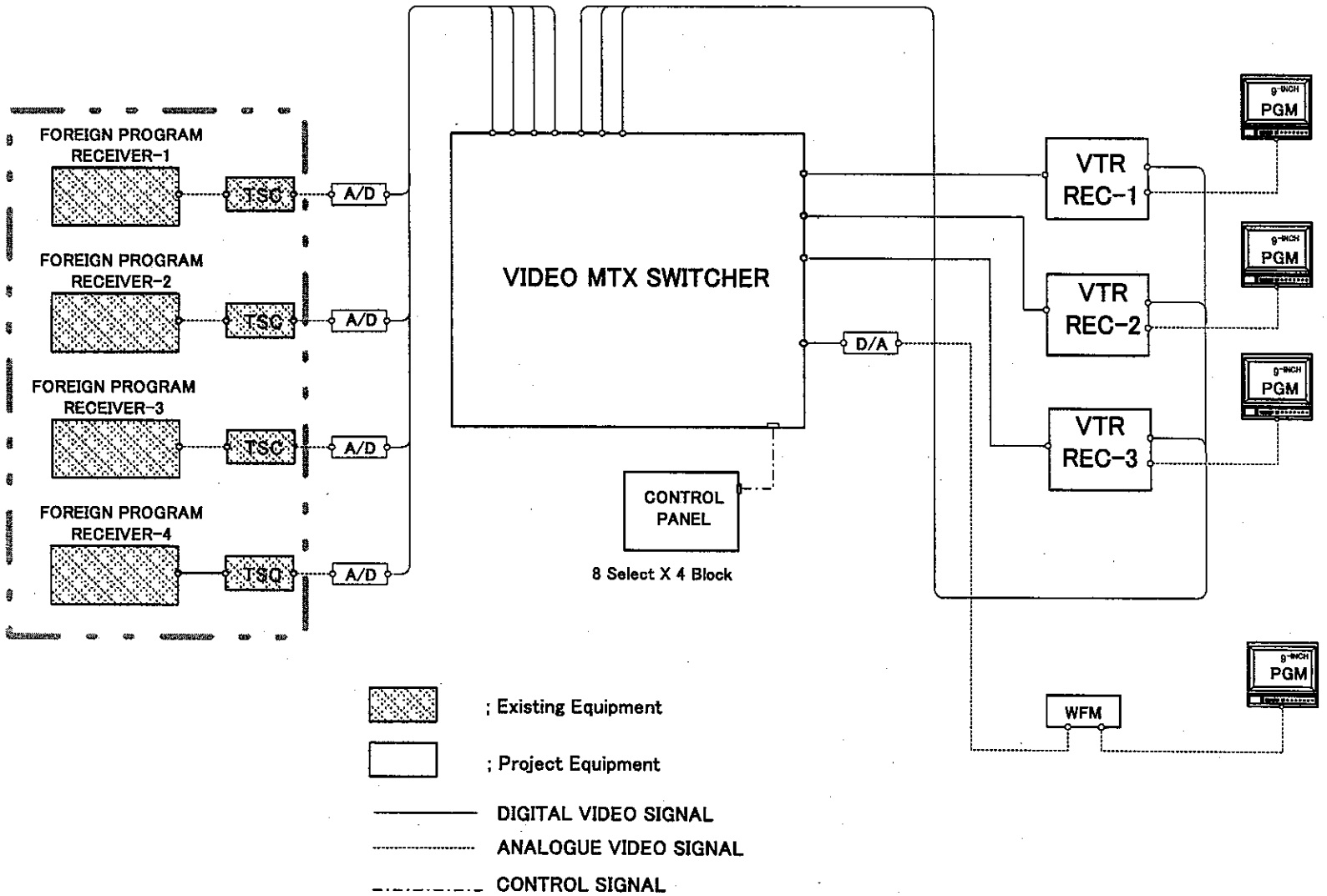


Fig. 2-2-14 (1/3) Foreign Program Recording System, Video and Control Signal Connection Diagram

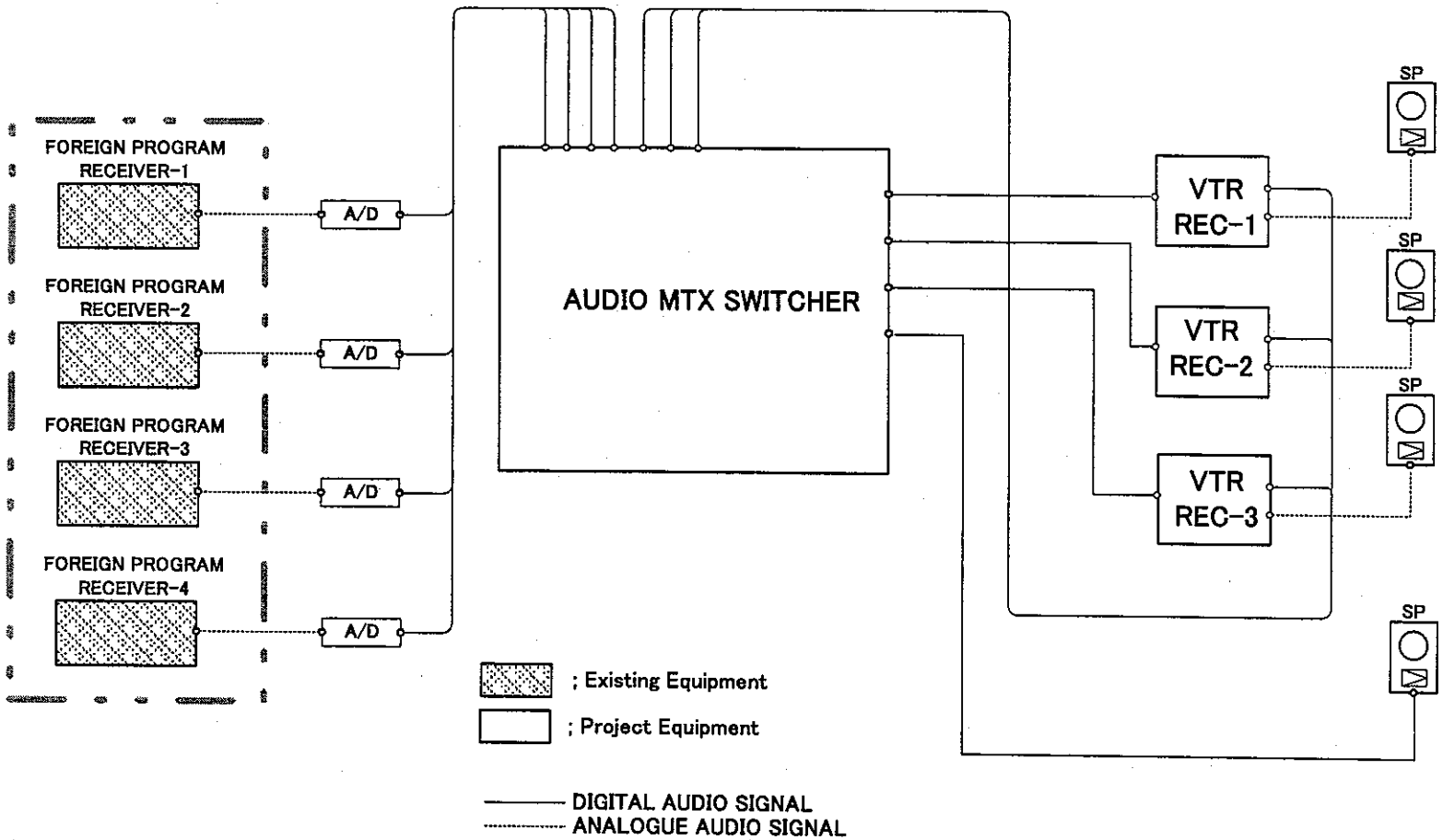


Fig 2-2-14 (2/3) Foreign Program Recording System, Audio Signal Connection Diagram

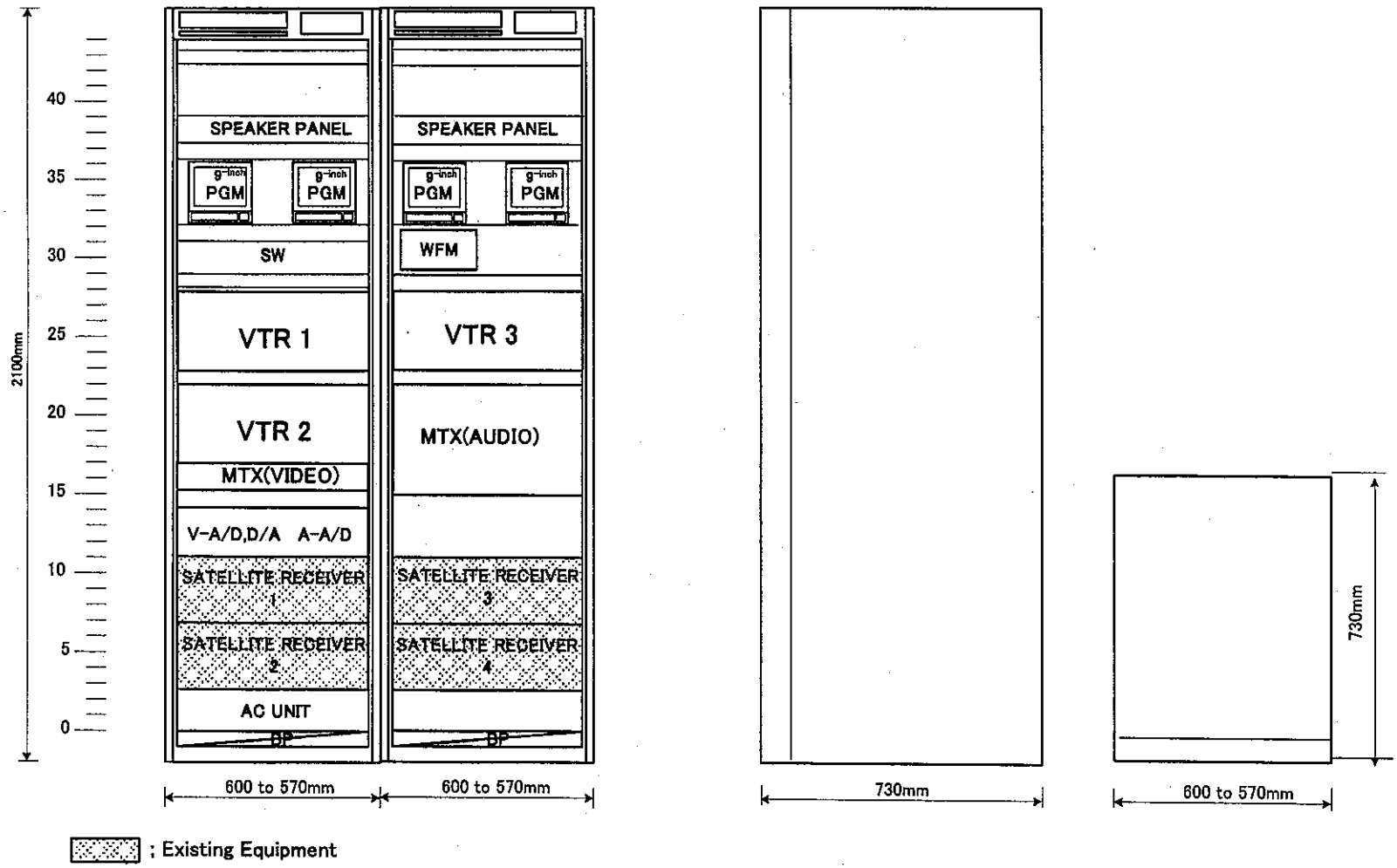


Fig. 2-2-14 (3/3) Foreign Program Recording System, External View of Racks

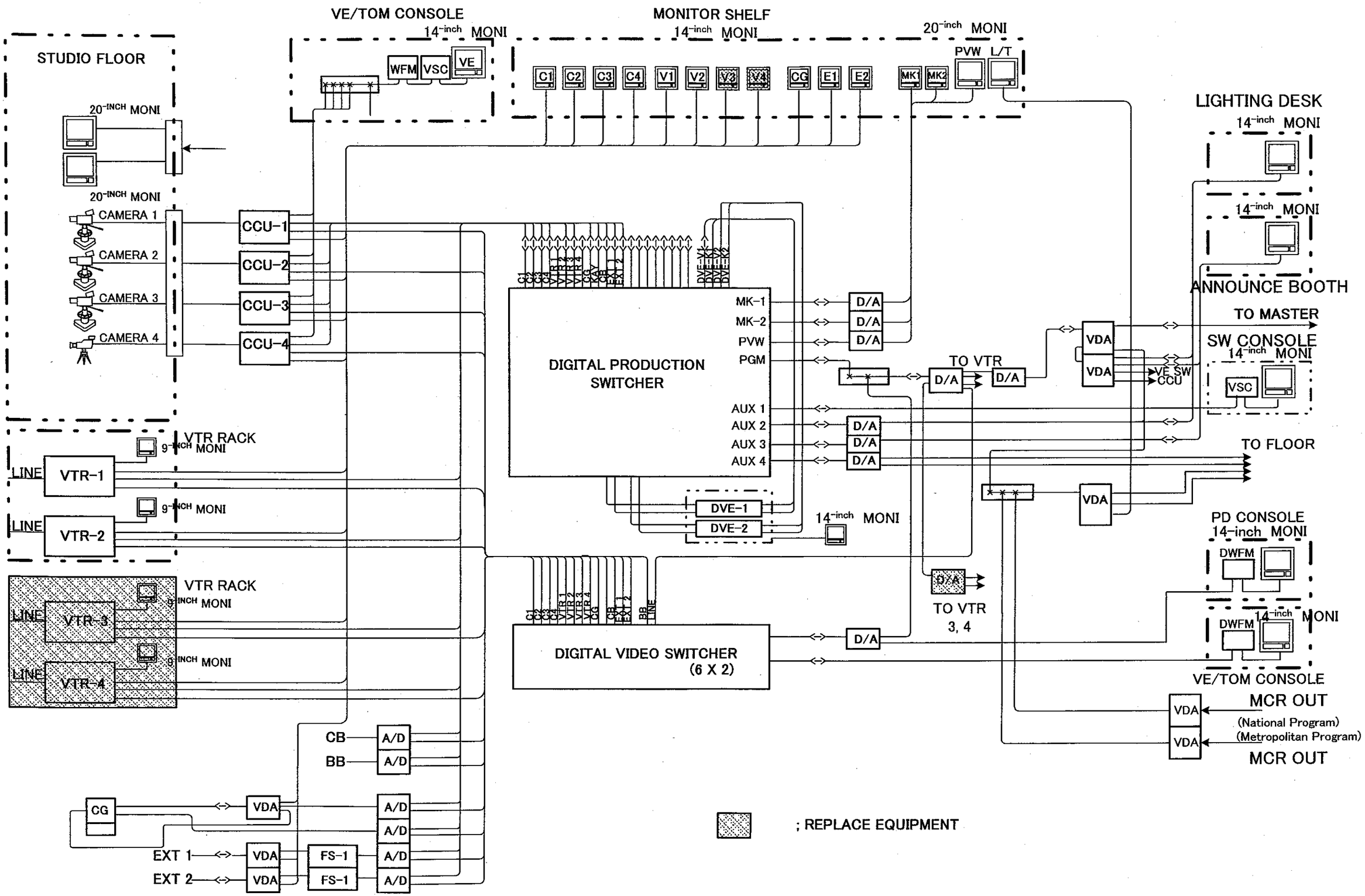


Fig. 2-2-15 (1/6) Studio Recording VTR System in Studio 6, Video Signal Connection Diagram

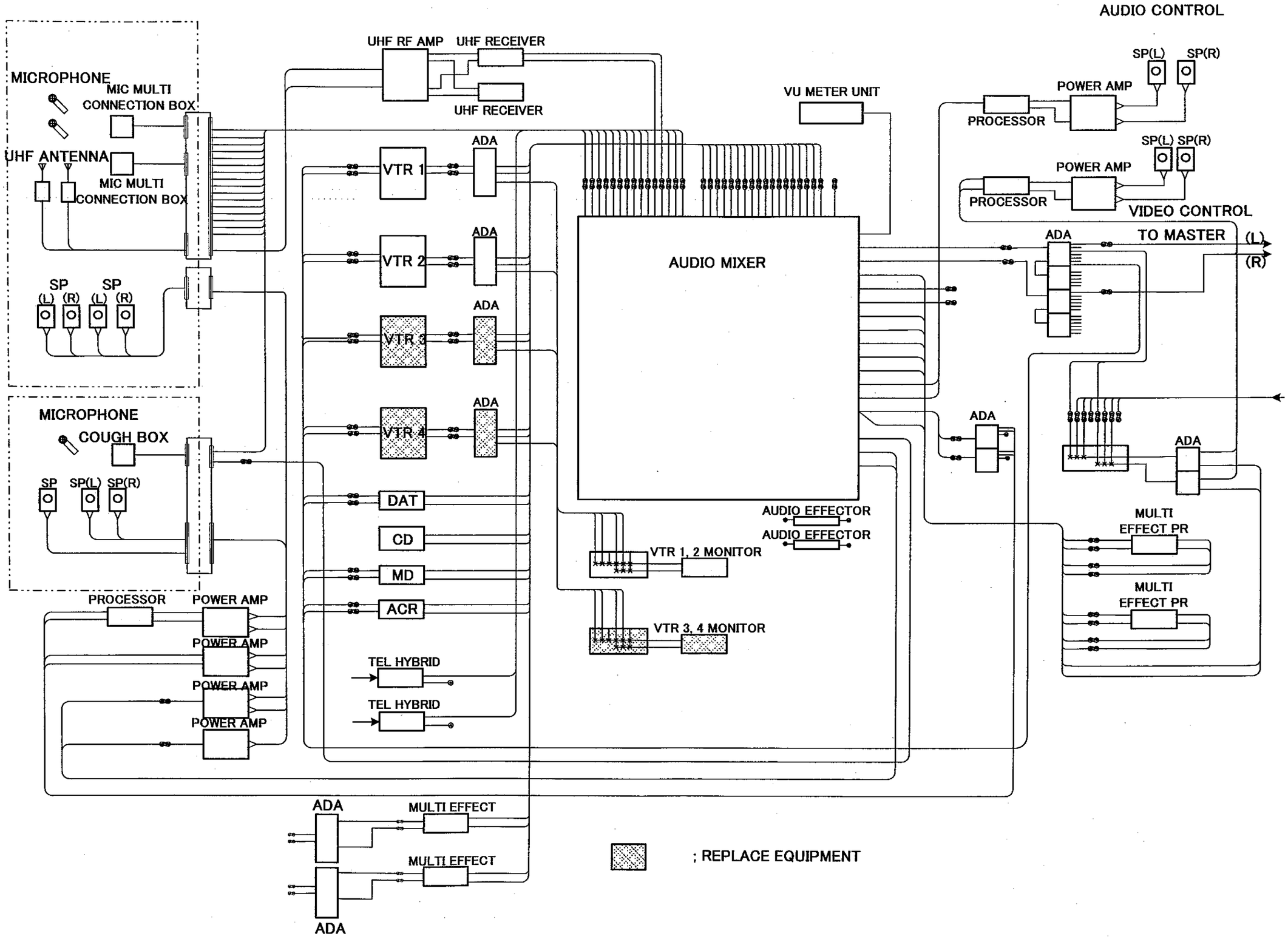
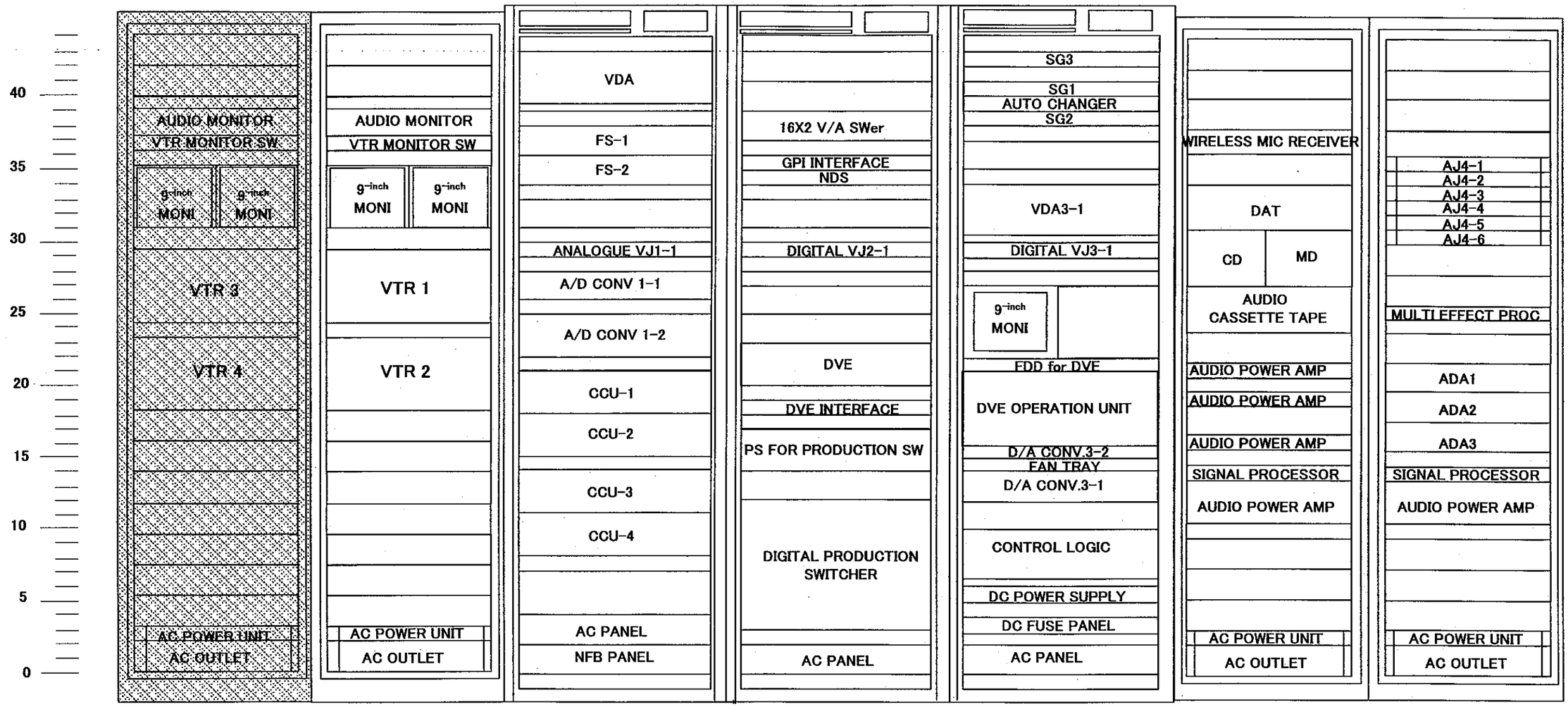


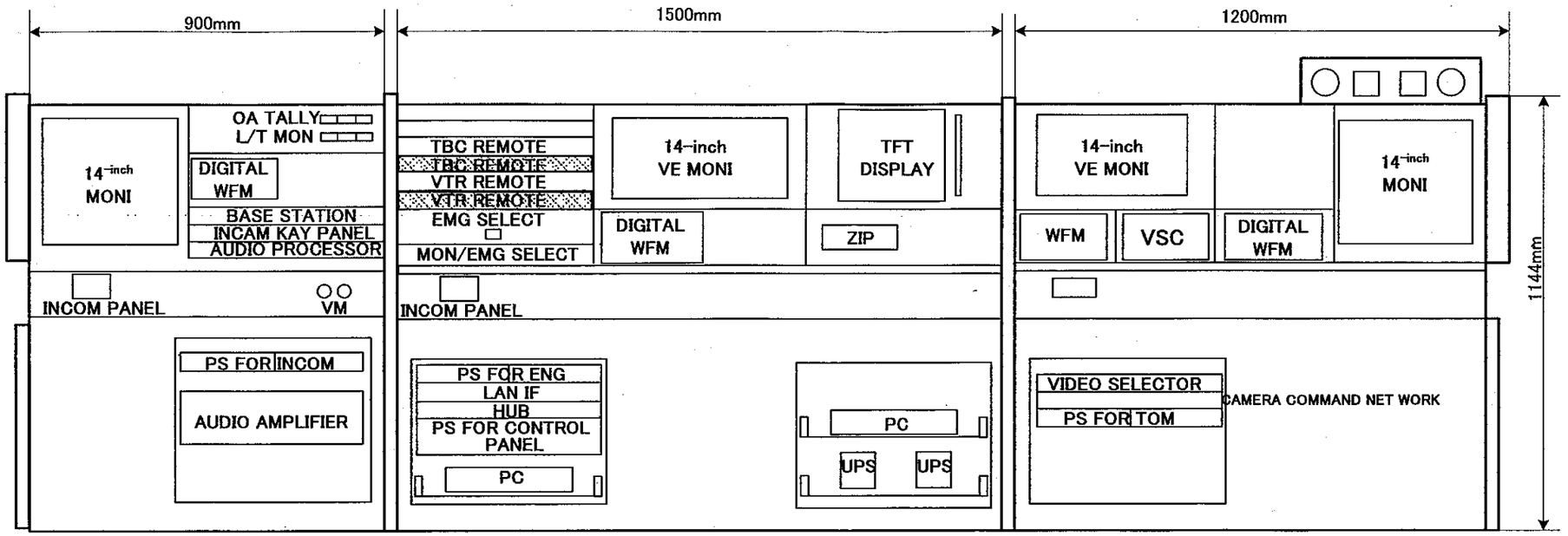
Fig. 2-2-15 (2/6) Studio Recording VTR System in Studio 6, Audio Signal Connection Diagram



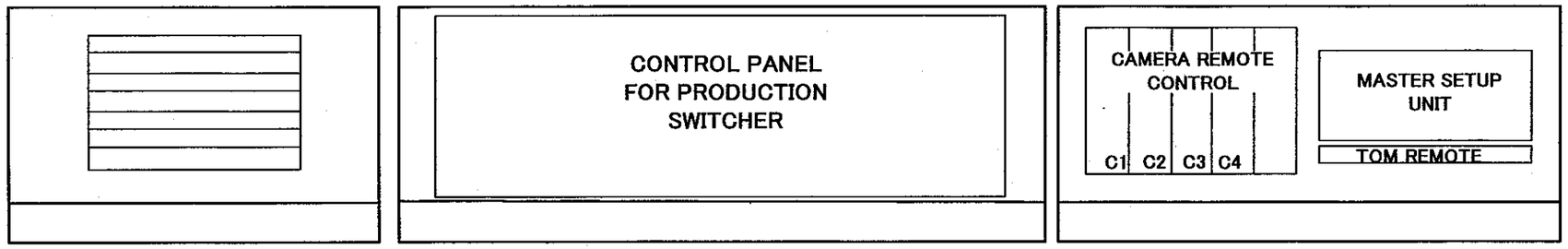
; Replace Equipment

Fig. 2-2-15 (3/6) Studio Recording VTR System in Studio 6, External View of Racks

VERTICAL PANEL



HORIZONTAL PANEL



; Replace Equipment

Fig. 2-2-15 (4/6) Studio Recording VTR System in Studio 6, External View of Console

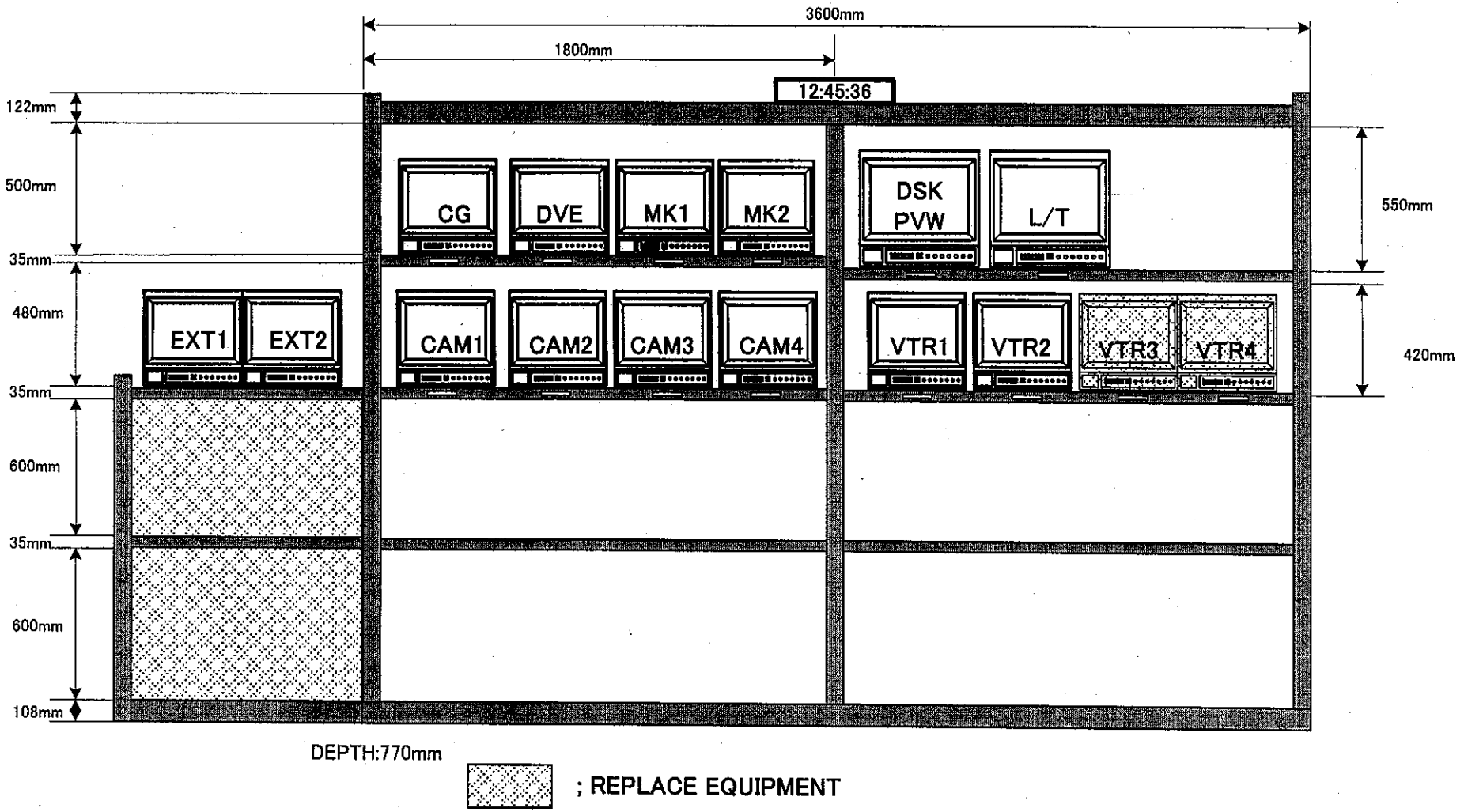


Fig. 2-2-15 (5/6) Studio Recording VTR System in Studio 6, External View of Monitor Shelf

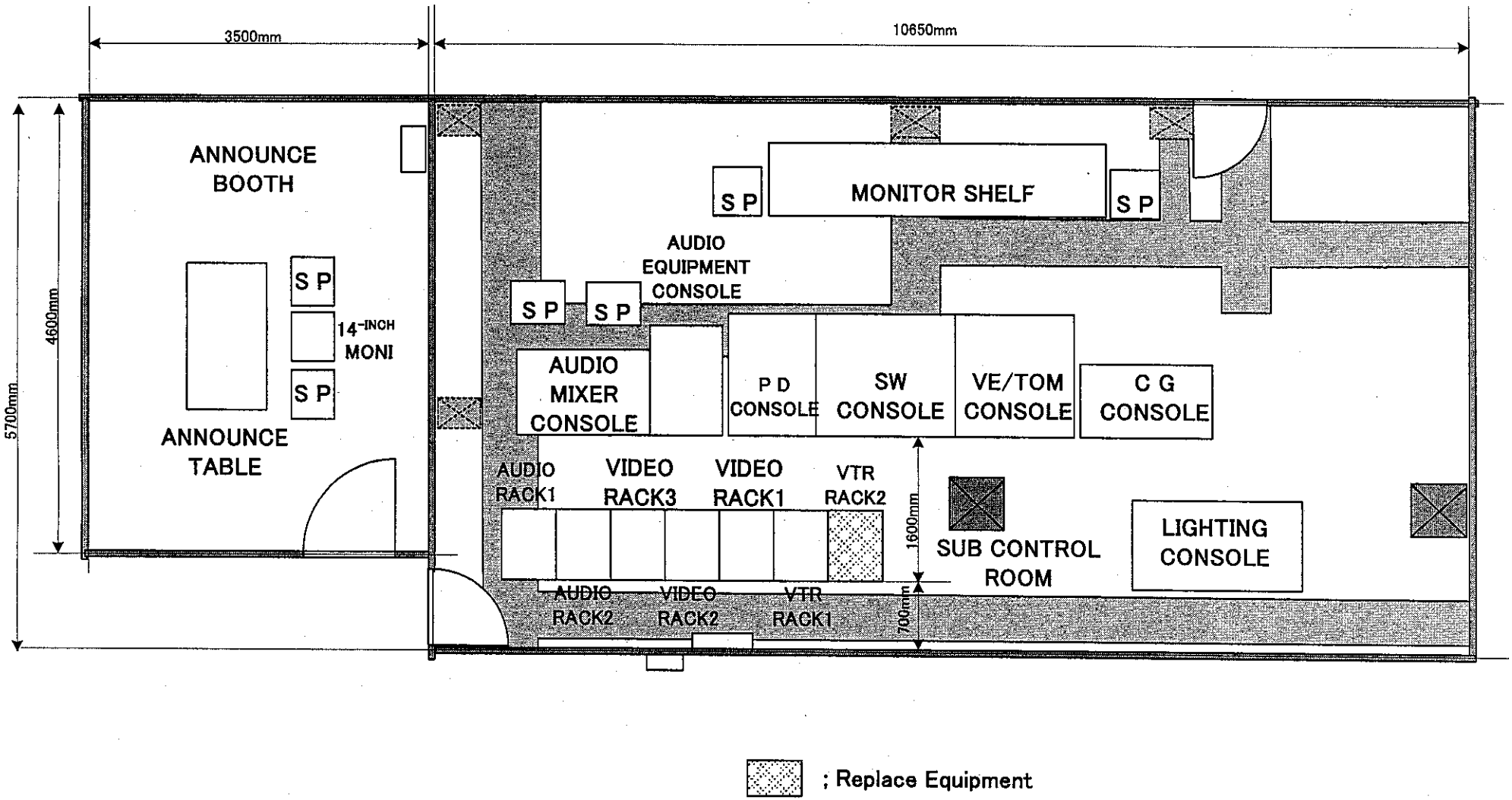


Fig. 2-2-15 (6/6) Studio Recording VTR System in Studio 6, Layout of Sub Control Room

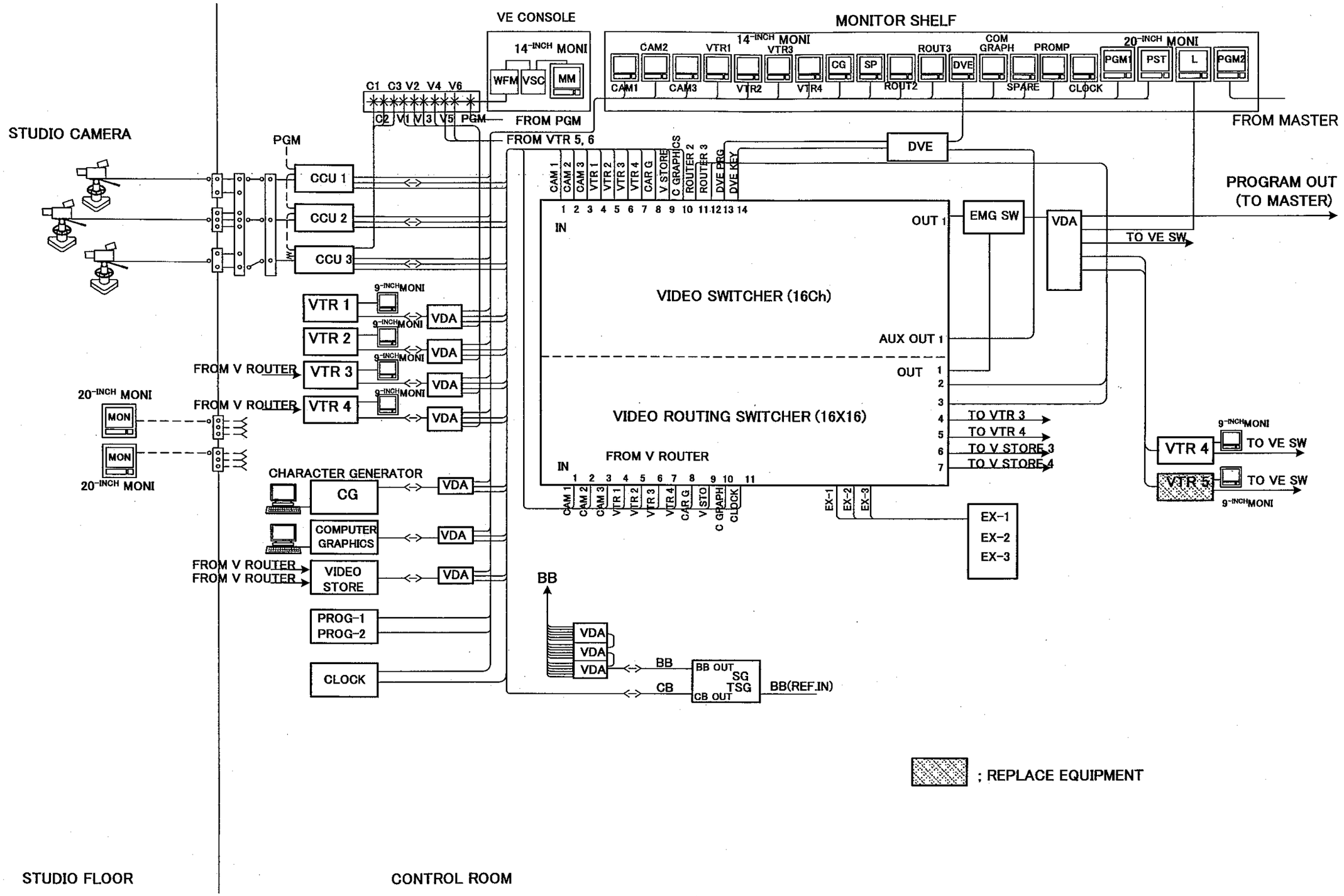


Fig. 2-2-16 (1/3) Studio Recording VTR System in Studio 10, Video Signal Connection Diagram

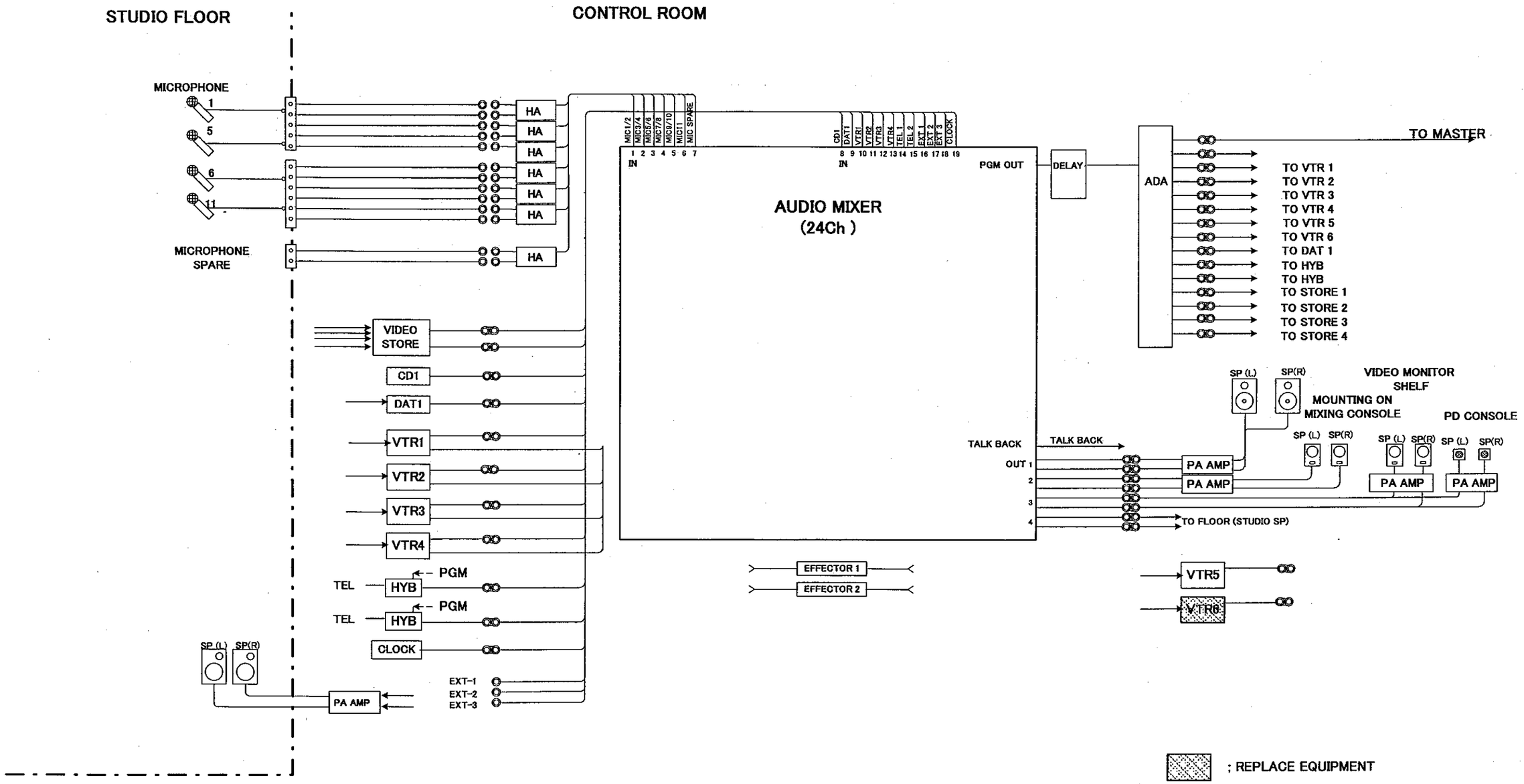
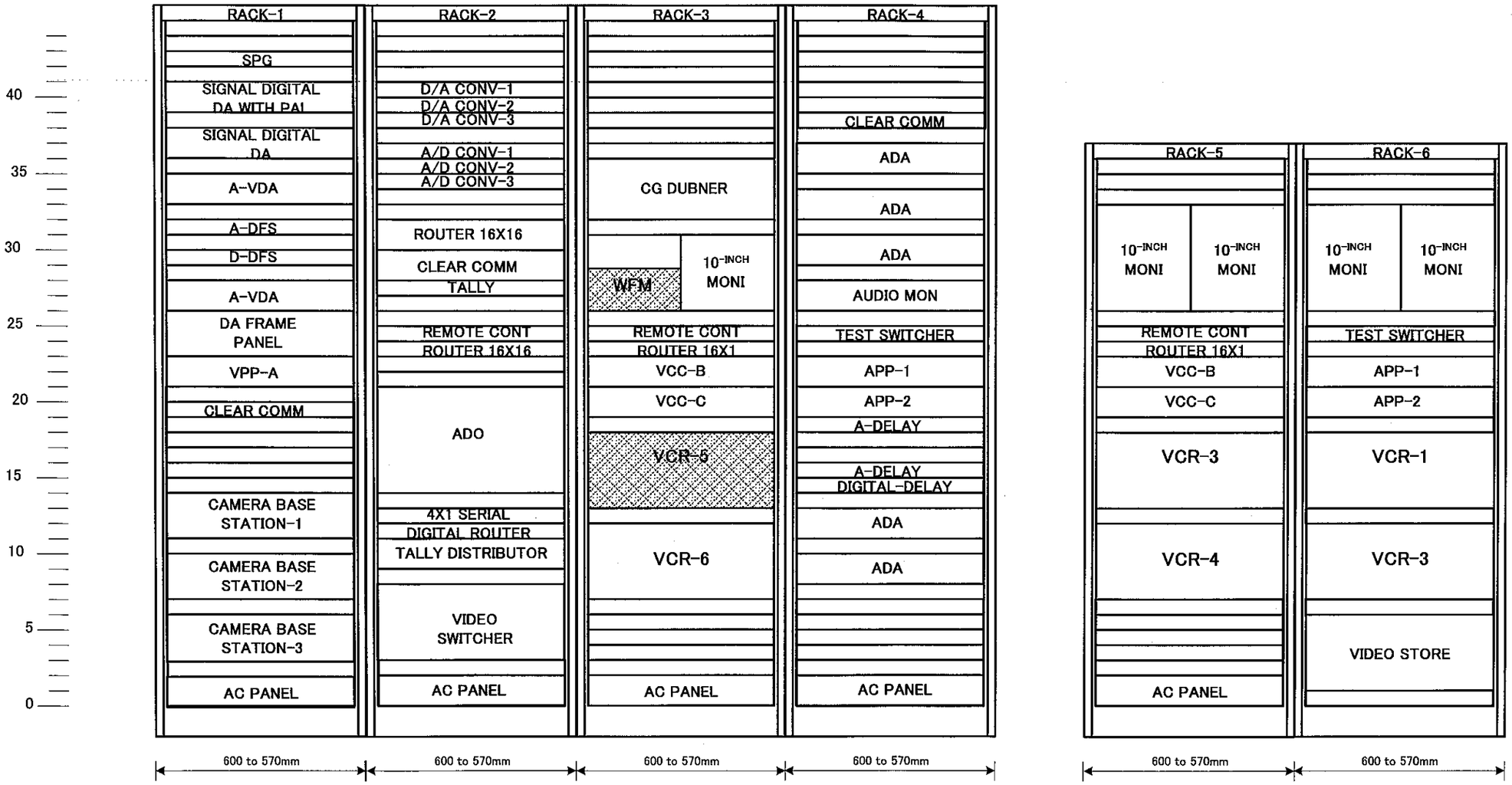


Fig. 2-2-16 (2/3) Studio Recording VTR System in Studio 10, Audio Signal Connection Diagram



; Replace Equipment

Fig. 2-2-16 (3/3) Studio Recording VTR System in Studio 10, External View of Racks

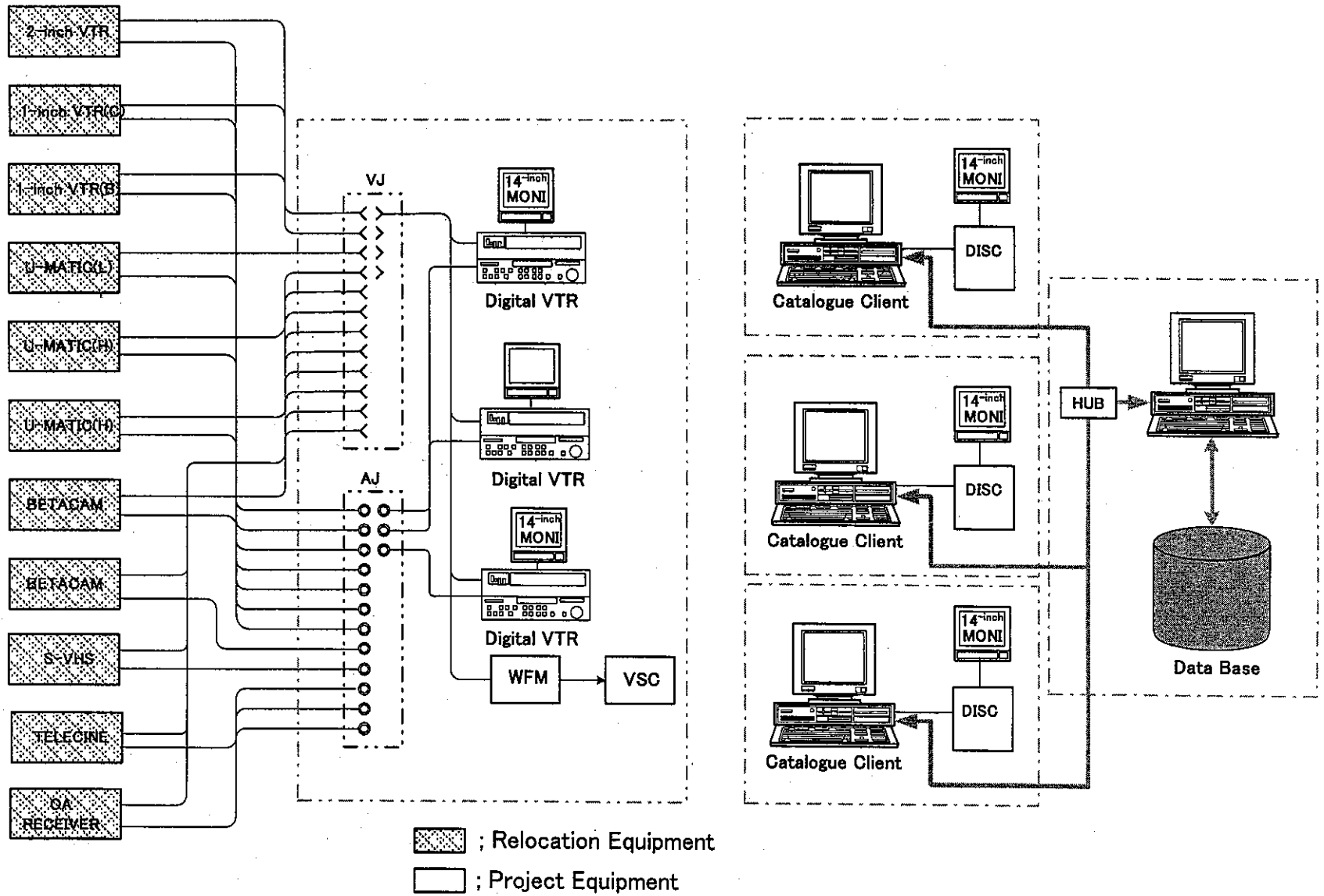


Fig. 2-2-17 (1/4) Broadcast Tape Storage System, Connection Diagram

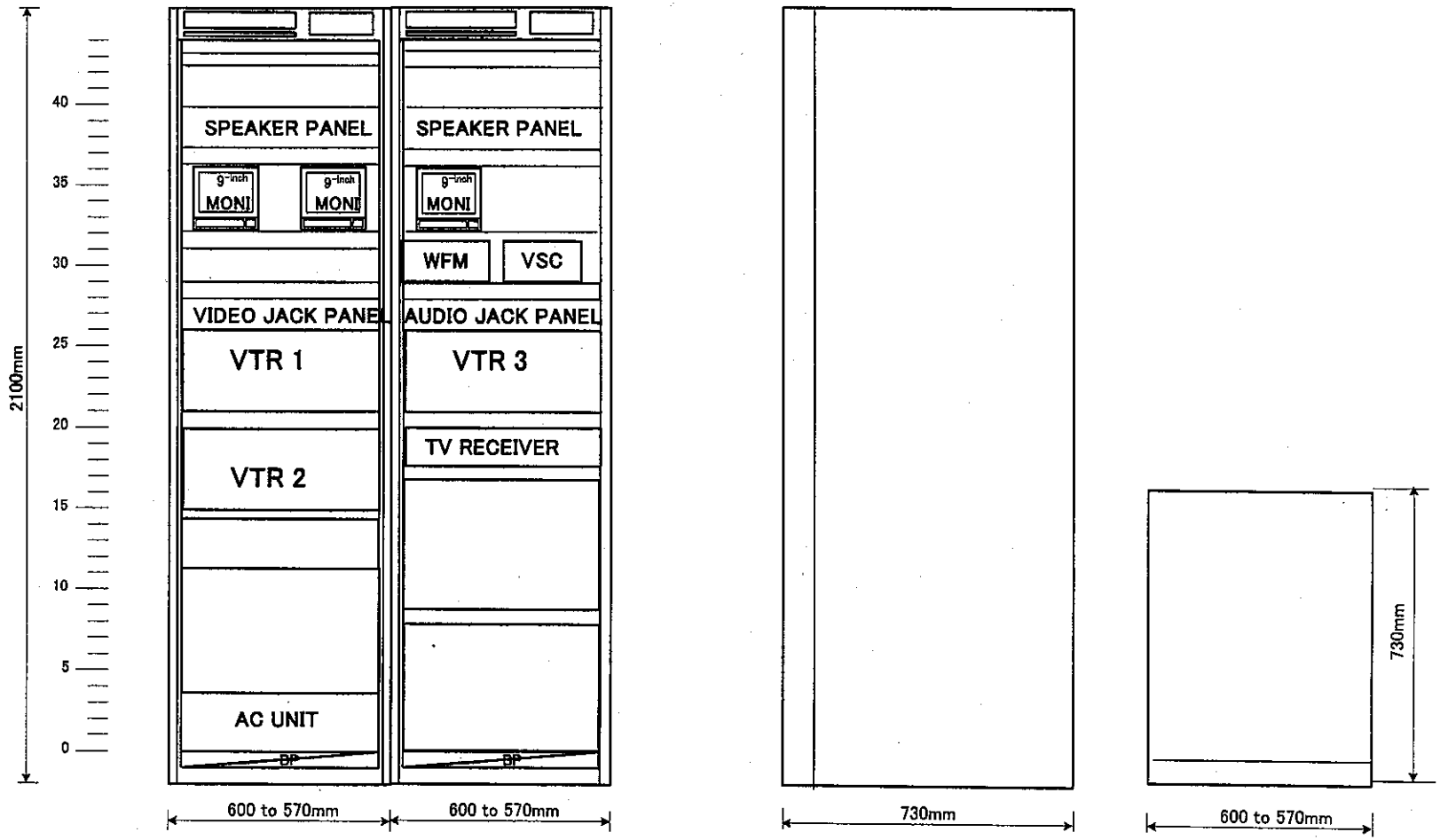


Fig. 2-2-17 (2/4) Broadcast Tape Storage System, External View of Racks

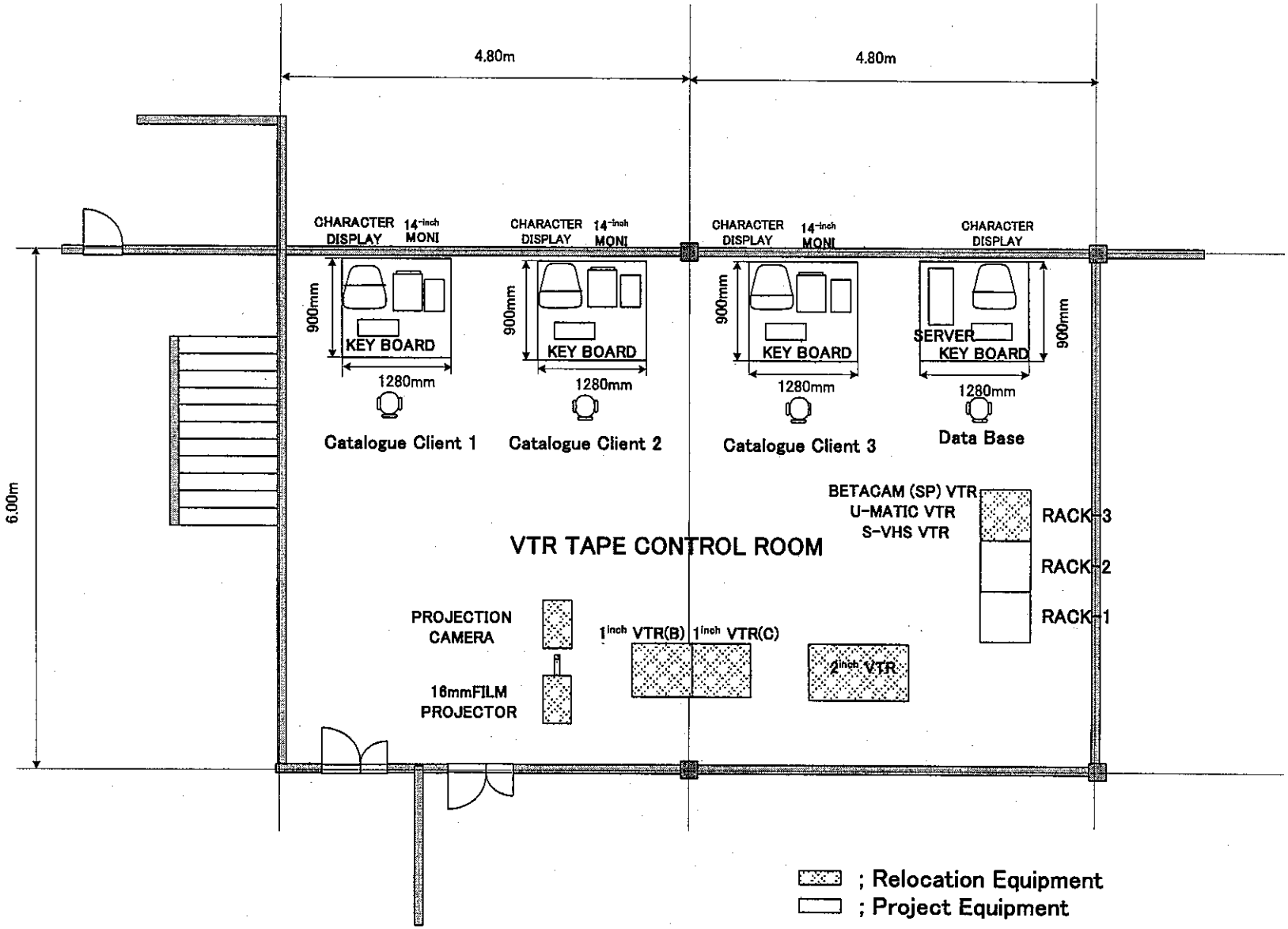


Fig. 2-2-17 (3/4) Broadcast Tape Storage System, Floor Layout of Control Room

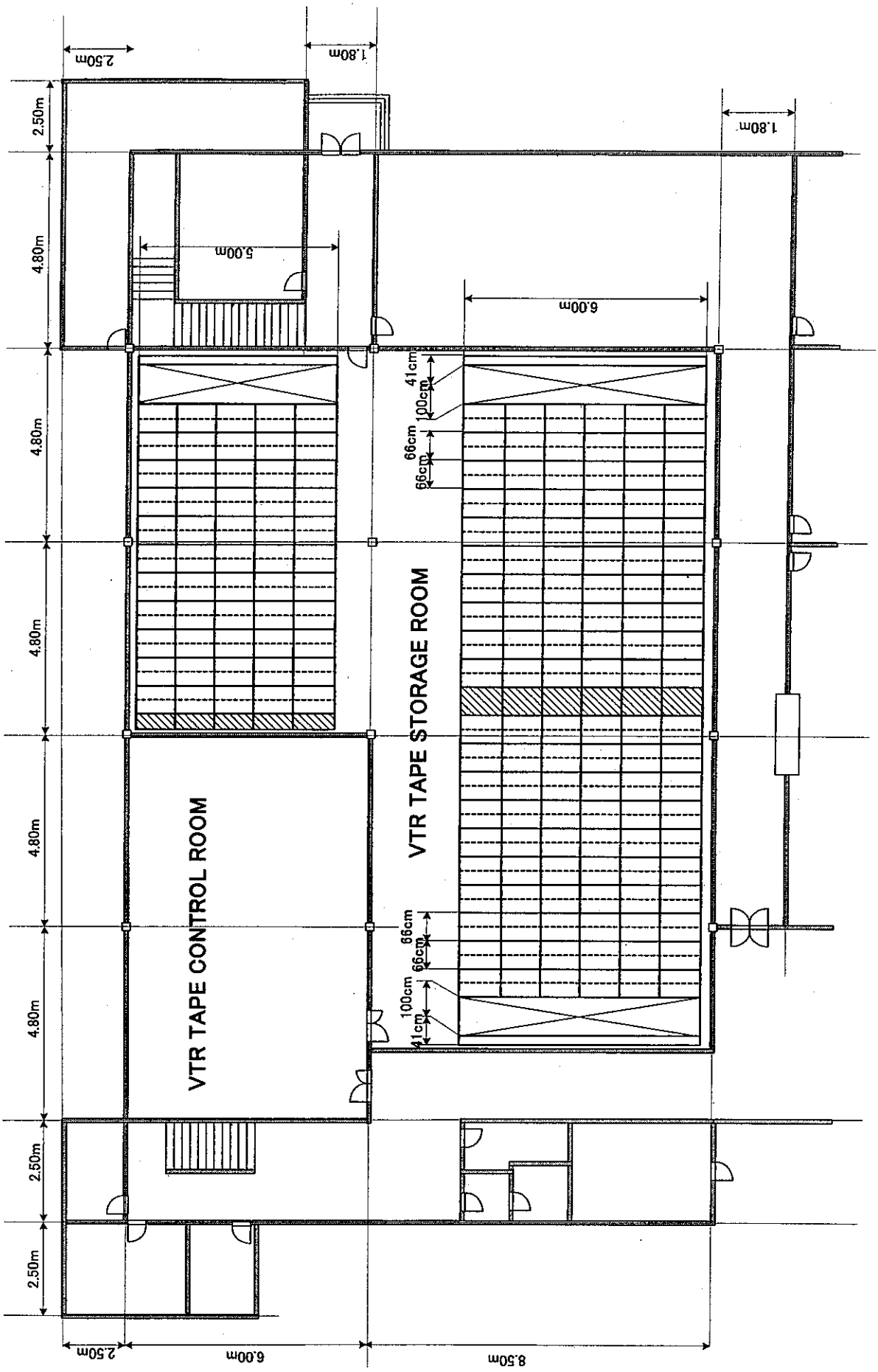


Fig. 2-2-17 (4/4) Broadcast Tape Storage System, Layout of Racks

2-2-4 Procurement and Installation Plans

2-2-4-1 Policies on Procurement and Installation

If this project is to be implemented under the Grant Aid system of Japan, the following procedures will be taken. After the approval of the project by the Japanese Cabinet and signing of the Exchange of Notes (E/N) between the governments of Japan and Indonesia, the Indonesian government will enter into a contract with a Japanese consultant firm, which will then begin the detailed design for the equipment. Upon completing the tender documents, the consultant firm will give tender notice. A Japanese equipment supplier will be selected by tender to procure and install the equipment for the project. The contract between the Government of Indonesia and the consultant firm & the equipment supplier will take effect upon the verification thereof by the Government of Japan.

(1) Implementing Agency

The Indonesian Ministry of State Owned Enterprises (BUMN) will be the control authority of this project and become The Responsibility Ministry on the Indonesian side. The Television of the Republic of Indonesia (TVRI) will act as the Implementing Agency to coordinate the entire project works.

It is recommended that the Indonesian side organize a project team at an early stage and appoint personnel in charge of each work, under whose direction the members of each working group can carry out their respective tasks. Important items to be under taken by the Project Team are as follows:

- Appropriation of budget for the works to be undertaken by the Indonesian side, and laying out of work plans according to the project implementation schedule.
- Extraction of the procedure needed to handle the legal formalities by the Indonesian side during the Project Implementation Period.
- Determining the permits and licenses required for the project, and the provision of pertinent information to the consultant firm.

(2) Consultant Firm

After the signing of the above E/N, the Indonesian government will enter into a consultant agreement with a Japanese consultant firm to undertake the detailed design of the project, and the said agreement will be verified by the government of Japan. After the verification of the agreement, the consultant firm will discuss the details of the

project with the representatives of BUMN and TVRI, and prepare the tender documents, including the detailed design drawings, which are to be approved by the Indonesian government.

Based on these tender documents, the consulting firm will put the work out for tender, and supervise everything from tendering, installation, acceptance testing and handing over of the project equipment.

(3) Equipment Supplier

The equipment supplier will be selected by tender from among Japanese trading companies that meet certain requirements and qualifications. The supplier will procure and install the equipment according to the specifications and within the time for completion stipulated in the contract. During the installation stage, the supplier will dispatch engineers specialized in each type of equipment to perform the installation work and explain the operation of equipment to the Indonesian staff.

(4) Necessity for Equipment Installation Staff

Most of the equipment to be procured under this project will be manufactured in Japan or third-party countries and shipped to the project site if necessary, disassembled into component parts. To set up the equipment in the TV station, the equipment will have need to be reassembled from these components, installed, and adjusted at the site.

The installation work will involve a series of handover procedures, such as giving instructions and training with regard to equipment operation, and doing an inventory on the equipment. A dispatch of engineers will be necessary to handle such jobs. The number of engineers and the duration of their dispatch will be kept at a minimum, by employing local technicians and engineers as much as possible.

2-2-4-2 Points to Note in Installation and Procurement

(1) Ensuring Safety throughout Installation Stage

In installation work, the latest information with regard to the public security around the project site should be gathered to ensure safety.

If ensuring safety is difficult or impossible, Japanese governmental agencies (the Embassy of Japan in Indonesia, JICA Representative Office in Indonesia, Ministry of Foreign Affairs, and JICA Headquarters) will discuss the problems with the Indonesian

Ministries concerned (BUMN and TVRI) to determine alternative plans.

(2) Conducting OJT

The staff members of TVRI's News Division need to be fully trained especially with regard to the operation, periodic maintenance, and parts replacement method of the digital equipment to be procured under this project.

OJT will be conducted by inviting as many persons as possible from the TVRI News Division at the time of installing and adjusting the equipment.

(3) Procedures for Importing Equipment

All types of equipment imported into Indonesia are subject to taxation. Importers of equipment must pay customs duties to the Ministry of Finance.

In this project, the Indonesian side will pay the duties to the Ministry of Finance at the rate applied to broadcasting equipment (= 29.37% of CIF cost, which consists of the following:)

1) Import Duty ：15% × CIF
2) PPH Import ：2.5% (CIF + Import Duty) ; PPH = Pajak Penghasilan
3) VAT Import ：10% × (CIF + Import Duty)

An Exchange of Notes (E/N) to be soon agreed upon between Indonesia and Japan, however, will include a provision for tax exemption where it concerns Grant Aid projects.

The Indonesian side will therefore have to go through tax exemption procedures in importing the project equipment.

2-2-4-3 Scope of Works

If the project is to be implemented under Japan's grant aid system, the scopes of works to be undertaken respectively by the Japanese and Indonesian sides will be as follows:

(1) Works to be undertaken by the Japanese Side

1) Procurement, installation, wiring and adjustment of equipment
2) Installation of slide-racks for the broadcast tape storage system.

3) Installation of electrical cables from the power distribution box to the equipment in each room.

(2) Works to be undertaken by the Indonesian Side

1) Renovation work of the ex-RTF building in which the equipment will be installed. The construction work includes the following:
   - Renovation works of partition walls between the existing office rooms on the 1st and 2nd floors in order to install the project equipment.
   - Installation of sound insulation in the announce booth.
   - Securing of uninterrupted commercial power supply.
2) Securing of continuous commercial power supply for the Project equipment
   - Supplying a protectional commercial power (with stand-by engine) from TVRI main building's main power room to each of ex-RTF's each equipment rooms.
   - Installation of a power distribution box in each equipment room for the appropriate quantity and load capacity of the equipment.
   - Installation of lightning arresters in the power distribution system.
   - Installation of grounding cables up to each equipment room from ex-RTF building's main power room.
3) Relocation of existing equipment to be used for other purposes.
4) Installation of an air-conditioning system in each equipment room
   - Installation of an air-conditioning system in each equipment room
   - Installation of air-conditioning and dehumidification regulating systems in the broadcast tape storage room.
5) Other works to be carried out by the recipient country side as stipulated in the Minutes of Discussion that were agreed upon at the time of Basic Design Study.

For reference, the Minutes of Discussion defining the scope of works for each side is provided as an attachment to this report.

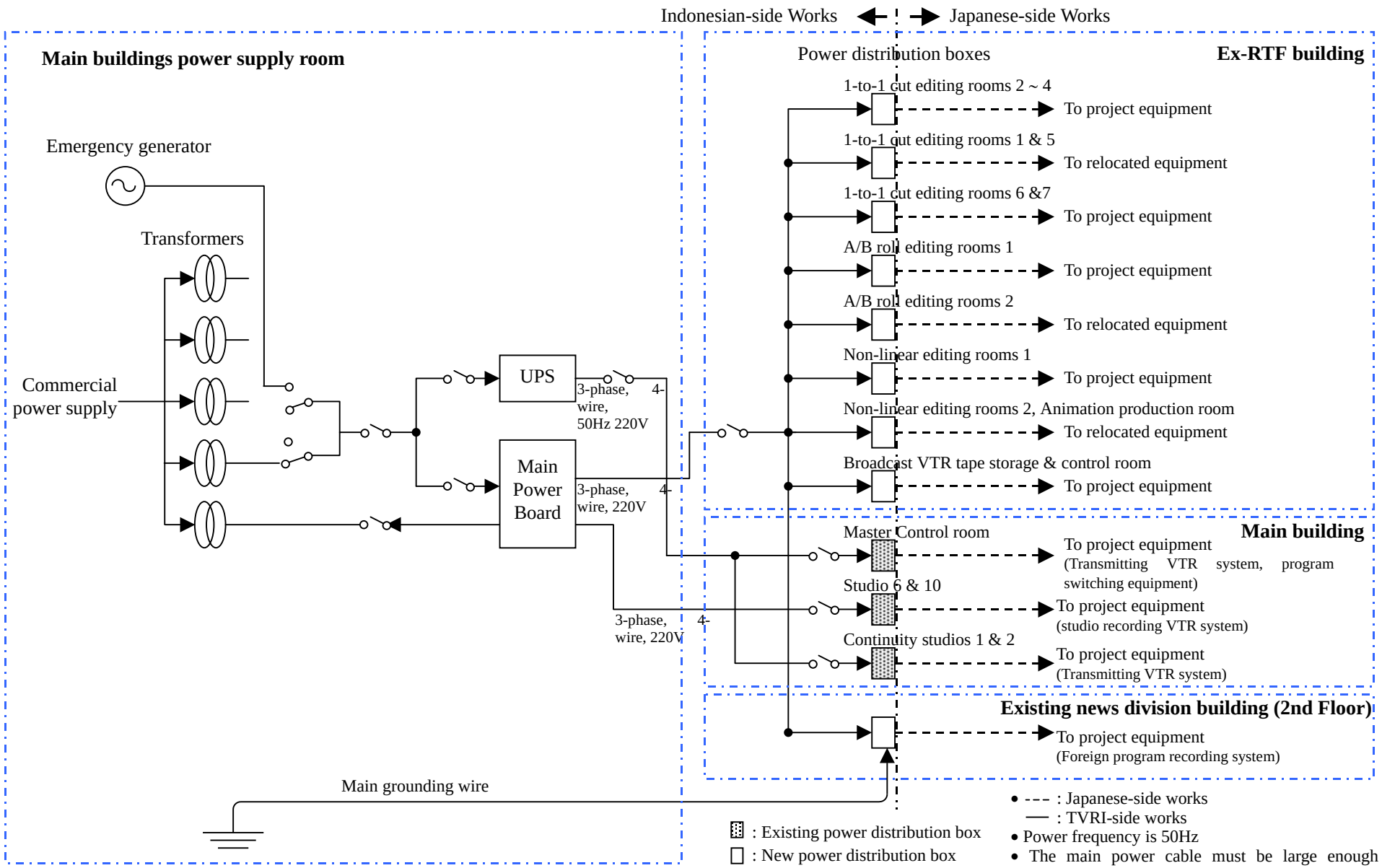


Fig. 2-2-18 Scopes of Power-supply and Grounding Works

2-2-4-4 Supervisory Plan for Procurement and Equipment Installation

Pursuant to the grant aid guidelines of the government of Japan, the consultant firm will organize a project team, which will facilitate the smooth implementation of the project from detailed design and supervision of installation works to handover of the equipment. During the installation stage, the consultant firm will dispatch supervisors with proper technical qualifications who will give instructions and recommendations to the contractors as necessary to ensure that the project will be implemented smoothly without delay.

(1) Main Policies on Supervisory Plan

The consultant firm will work closely with the agencies and representatives concerned of both countries in order to keep the project implementation on schedule as stipulated:

- Giving advice and guidance to the contractor so that the equipment will be procured and installed according to the design documents;
- Adequate training on the operation and maintenance of equipment for TVRI;
- Giving TVRI staff guidance on the maintenance method for smooth operation of the project equipment.

(2) Scope of Supervisory Works

- Assistance in Conclusion of Equipment supply & installation Contract

  The consultant firm will prepare tender documents, decide the form of tender, create the contract, check the breakdown list of equipment, and witness the signing of the contract between TVRI and the Contractor.
- Inspection of Documents Submitted by Contractor

  The consultant firm will check drawings, material samples, and other items submitted by the contractor and inspect them as necessary.
- Guidance for Installation Work

  The consultant firm will check the work schedule and the work plan, give guidance to the contractor, and report the work progress to the client.
- Assistance in Payment Procedure

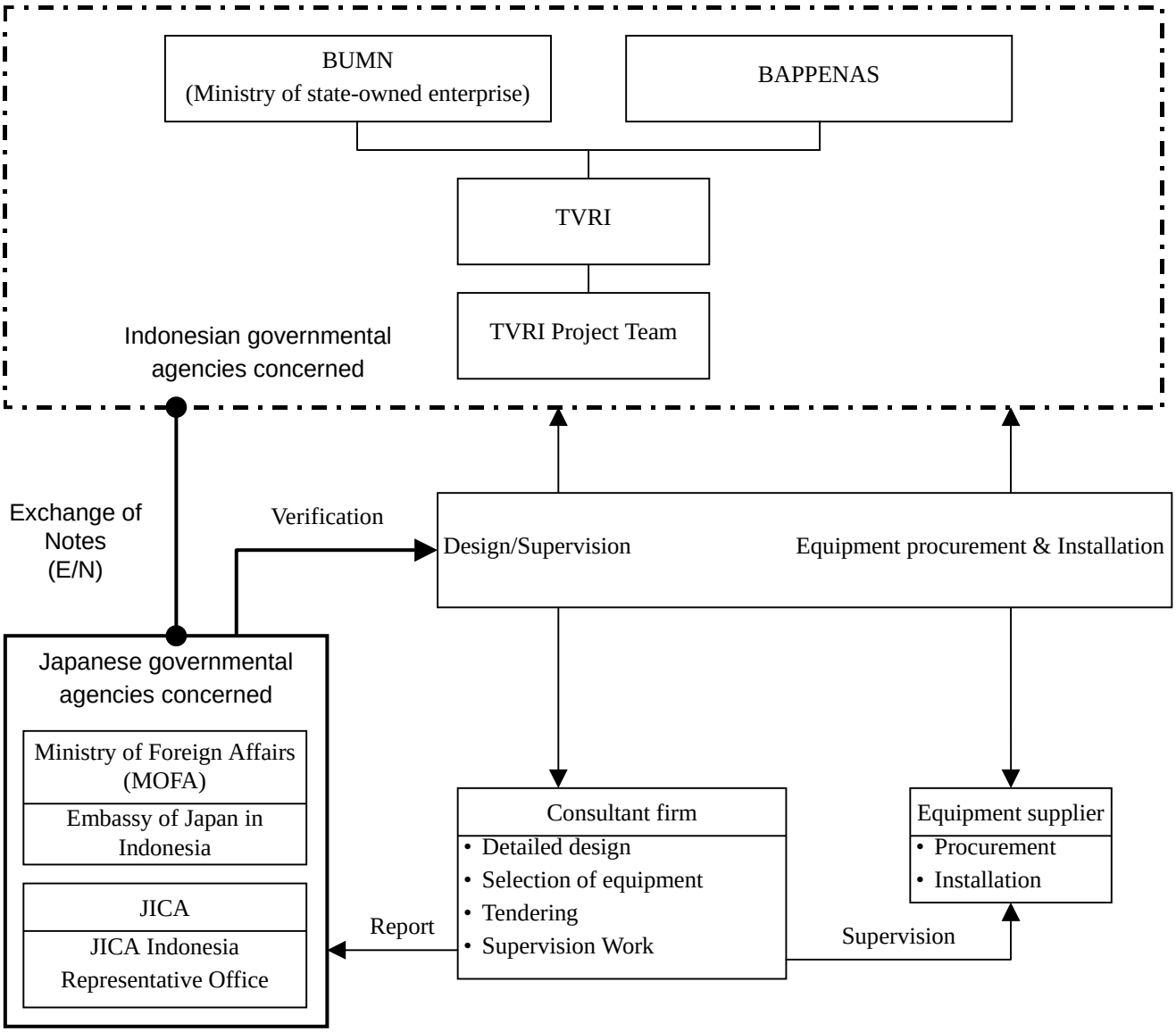
  With regard to the fees to be paid to the contractor during or after the completion of work, the consultant firm will check the contents of each invoice against the progress of the work to facilitate the payment procedure.

- Various Acceptance Tests

  The consultant firm will inspect each work for its quality and finish, and give instructions to the contractor as necessary. Also, it will check whether or not the works are being carried out according to the stipulations in the contract and attend the various tests and inspections to be conducted between the commencement and completion of works, as well as the final acceptance inspection of the project. The work of the consultant will be deemed completed upon the approval by the client. In addition, the consultant will report on the progress of works to the officials concerned of the Japanese government and provide them with pertinent information necessary for the payment procedure and handover.

Fig. 2-2-19 bellow shows the supervisory system of this project.

Fig. 2-2-19 Supervisory System



2-2-4-5 Equipment Procurement Plan

(1) Procurement Plan

In principle, equipment to be procured under Japan's grant aid projects must be origined from Japan or the recipient country.

However, the news production equipment built with the latest electronics components is not produced in Indonesia.

Much of the existing equipment at TVRI is made in Japan, while the rest is made in Europe and the United States. TVRI prefers Japanese products for this project, as TVRI engineers trust them from the viewpoint of performance, reliability, supply stability, and follow-up services (Japanese products come with 10-year warranties for spare parts supplies). But third party country procurement may be considered for Character Generators from the viewpoint of price and specifications.

(2) Equipment Transportation Plan

Equipment shipped from Japan will be unloaded at Jakarta Port and therefrom transported by land to the project site. The number of days for equipment transportation from Japan to the site is as follows:

《Japan → Jakarta Port》

There are regular ocean freight services (of over ten shipping companies) that ply between Japan and Indonesia almost daily. It takes approximately 15 to 19 days one-way depending on the route that each shipping company takes.

《Customs Clearance》

Jakarta Port has improved container cargo-handling facilities. Consequently customs clearance procedure takes a relatively short period of 3 to 5 days.

Documents needed for customs clearance are as follows:

- Bill of Lading
- Invoice
- Packing List

《Jakarta Port → Project Site》

Transportation: Truck

Distance: 10km

Time needed: 1 hour
30 minutes by passenger car

《Road Condition》

As all roads connecting Jakarta Port and the project site are paved with asphalt there is no problem in transporting project equipment.

It will take about 18 to 24 days to ship the equipment from Japan to the project site.

2-2-4-6 Quality Control Plan

According to the policies established in the basic design, the consultant firm will control the quality of works throughout the entire implementation process of this project.

"Quality control" in this case refers to and is defined according to the terminology of Japan Industrial Standard, "a system of means to economically produce goods or services in the quality required by the buyer thereof."

The quality control activities to be carried out by the consultant consist of the following:

(1) Examine various working drawings, technical documents, samples, and other items submitted by the equipment supplier, and check their conformity to the standards and requirements stipulated in the drawings and specification.

(2) Inspect the project equipment, this being performed by an accredited third-party testing institution before shipment.
- Compare the shipping list to the equipment list attached to the contract for discrepancy.
- Check the actual equipment against the packing list.
- Issue the Inspection Certificate

2-2-4-7 Implementation Schedule

If this project is to be implemented under the Grant Aid system of Japan, the following procedures shall be performed: i) an Exchange of Notes (E/N) will be singed between the two Governments, ii) the Government of Japan will recommend a Japanese consultant firm, iii) a design/supervisory contract will be concluded between the Government of Indonesia and

the consultant firm recommended, iv) the consultant firm will prepare detailed design documents, hold a tender ceremony, and enter into a equipment supply contract with the successful bidder, and v) the manufacture and installation work will begin. The Indonesian Ministry of State Owned Enterprises (BUMN) will be the Responsible Ministry of this project, and the Television of the Republic of Indonesia (TVRI) will be the Implementing Agency (being a party to the consultant agreement, equipment supply and installation contracts and issuing Authorization to Pay (A/P)).

(1) Detailed Design Stage

Based on the basic design, the consultant firm will prepare tender documents, comprised of Vol.I Instructions to Tenderers, Vol.II Conditions of Contract, Vol.III Technical Specifications, and Vol.IV Drawings. The consultant will have thorough discussions with the Indonesia agencies concerned at the initial, middle, and final phases of the detailed design stage. The consultant will submit the final tender document to the relevant authorities, and its work for this stage will be deemed completed when the results are approved by Indonesian side.

(2) Tender / Equipment Supply & Installation Contract Stage

At the end of detailed design stage, a tender will be held in the presence of personnel concerned (the Client, JICA staff, Consultant, Tenderers). The bidder who submits the lowest price, which must be deemed justifiable, will be successful bidder. BUMN/TVRI will conclude a contract with the successful bidder, the contract taking effect after the verification by the Government of Japan.

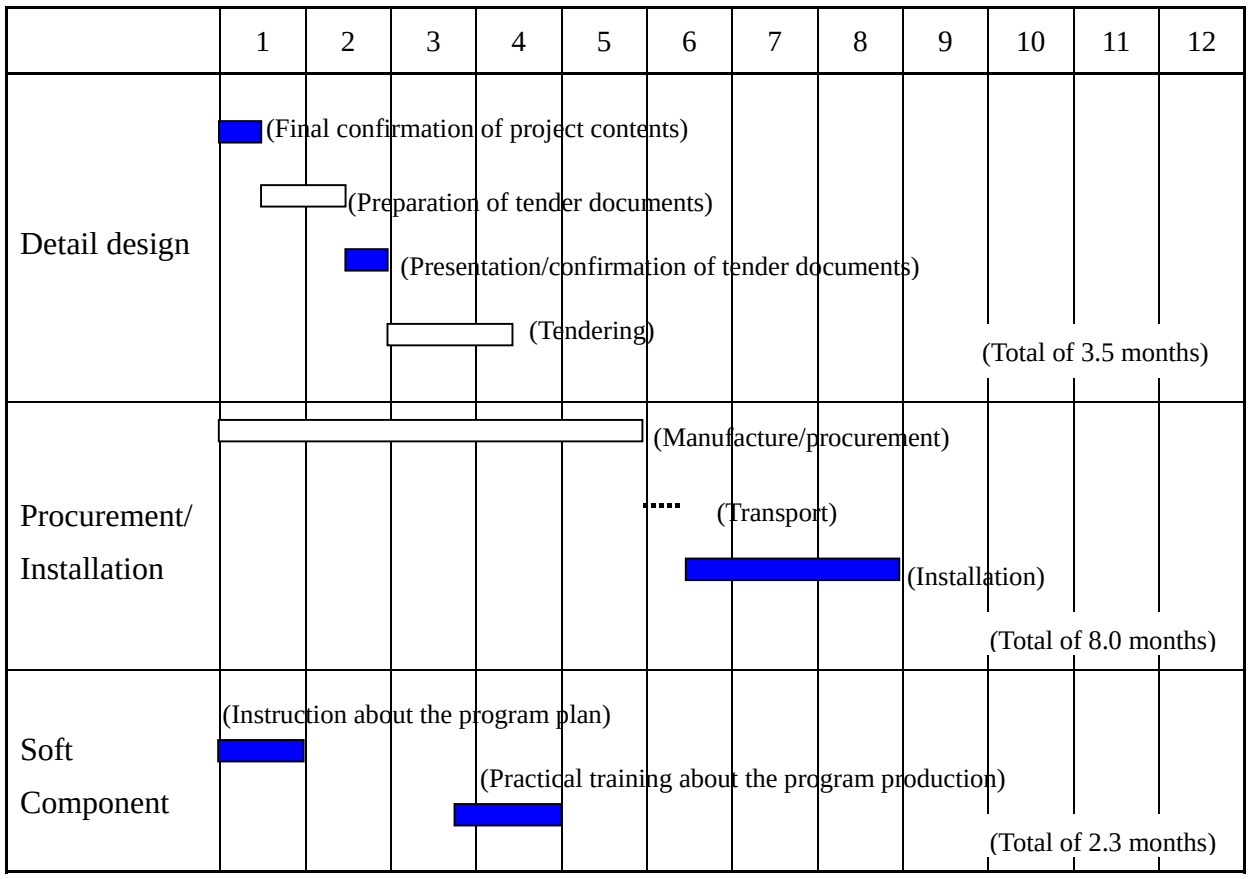
(3) Manufacture and Installation Work

After the signing of the contract between both parties, the contractor will commence the Manufacture & Installation work.

(4) Implementation Schedule

Summarized below is the implementation schedule for this project.

Table 2-2-5 Implementation Schedule



(Soft component activity will be carried out in accordance with the installation schedule)

2-3 Outline of Works to be Undertaken by the Indonesian Side

Listed below are the works to be undertaken by the Indonesian side when implementing this project under the grant aid system of Japan:

(1) Procedure for exemption of customs duties to taxable project equipment when importing the equipment (TVRI).

(2) Obtaining of all pertinent legal permits and licenses required in Indonesia (TVRI).

(3) Securing of storage space for the project equipment before installation work at the project site (TVRI).

(4) Securing of necessary budget and appropriate personnel to operate and maintain the project equipment (TVRI).

(5) Appropriate and efficient maintenance and operation of the project equipment (TVRI).

(6) Issuance of Authorization to Pay (A/P) and payment of banking commission (TVRI).

(7) All other works stipulated on the Exchange of Notes shall be performed by the Indonesian side (Indonesian parties).

Works to be undertaken by the Indonesian side at the project site are shown in the Item 2-2-4-3.

Table 2-3-1 below shows the cost for renovating the building and relocating existing equipment.

Table 2-3-1 Cost of Renovation / Relocation Works to be undertaken by the Indonesian Side

Item	Renovation/ Relocation Cost（Rp）	Budget
1. Renovation of Building (Preliminary works, Wall removal, Brick wall, Floor finishing, Window & door glass, Acoustic wall, Acoustic Door, Gypsum plafond, Floor carpet, Painting, Console, Toilet / rest room, Floor tile, Camera locker, Wall glass, AC split, Dehumidifier (CP. 10,020m^3), Ducting cable, Others)	1,000,000,000.00	Application submitted
2. Moving of existing tape rack	10,000,000.00	Appropriated
3. Moving of existing editing systems		
1) A/B roll editing system	900,000.00	Appropriated
2) Non-linear editing system	900,000.00	Appropriated
3) 1-to-1 editing system	900,000.00	Appropriated
4. Inland Transportation	89,500,000.00	
Total	1,102,200,000.00 Rp	

2-4 Project Operation / Upkeep Plan

2-4-1 Personnel at the News Division

TVRI presently employs about 7,200 employees, including the staff of regional stations. TVRI operates 13 production studios and 331 transmitting stations throughout Indonesia, covering 64% of the country's land area and about 82% of the population.

The News Division (Division II), the target site of this project, has a staff of 302 employees comprising the members as listed below:

Table 2-4-1 The Numbers of Employees at News Division (Division II) by Role

Manager	:	5
Assistant Manager	:	10
Reporter/Redactor/News Reader	:	117
Cameraman	:	51
Editor	:	24
Program Director	:	21
Soundman	:	5
Lighting	:	7
Documentation	:	7
Maintenance	:	3
Computer Graphic	:	3
Administration	:	15
Sport Personnel	:	15
Current Affair Personnel	:	19
Total	:	302

2-4-2 Technical Level of the News Division

When surveying the TVRI Headquarter, Jakarta Station, and News Division, we had the impression that their broadcasting equipment (although some items were new and others were obsolete) was kept in good condition for the most part by the production engineers who conducted daily inspections and repair work. They told us that they sometimes went to regional stations to support their maintenance upon request. We observed that the engineers of the News Division (Division II) transmit programs according to the timetable, start up and

check the operation of studio equipment (initial adjustment of cameras and color phase adjustment), set up lighting equipment, arrange microphones, manipulate the video-switcher, audio mixer, VTRs, and tape recorder/player, monitor video and audio quality, and handle other technical tasks efficiently without hitches (stoppage of video or audio waves), indicating that their technical capabilities were very high. However, we also became aware of certain problems, and we recommend the following items before the implementation of the project.

[Recommendation for Operation Work]

- Prepare operation manuals and promote their usage by staff.
- Keep records of daily inspection & monitoring works.

[Recommendation for Maintenance Work]

- At present, only daily maintenance and repair works are performed. That is to say, periodic maintenance is not yet being performed. Consequently we recommend that TVRI should plan and perform periodic maintenance activities in line with the technical standard of equipment.

2-4-3 Maintenance (Repair) System

TVRI's maintenance engineers belong to either the transmitting department or the production department within organization.

The production divisions of TVRI Jakarta (Division I) and of News Division (Division II) have their respective maintenance group, but they support each other in maintaining their respective equipment.

Repair work is done as part of the maintenance work. We saw ENG cameras, VTRs, and other devices being repaired by the maintenance group of the News Division. This also indicates the high technical capabilities of the maintenance staff, as repair of VTRs requires special skills & knowledge and technical guidance by the manufacturers.

For the effective implementation of the project, however, we would like to recommend the following items:

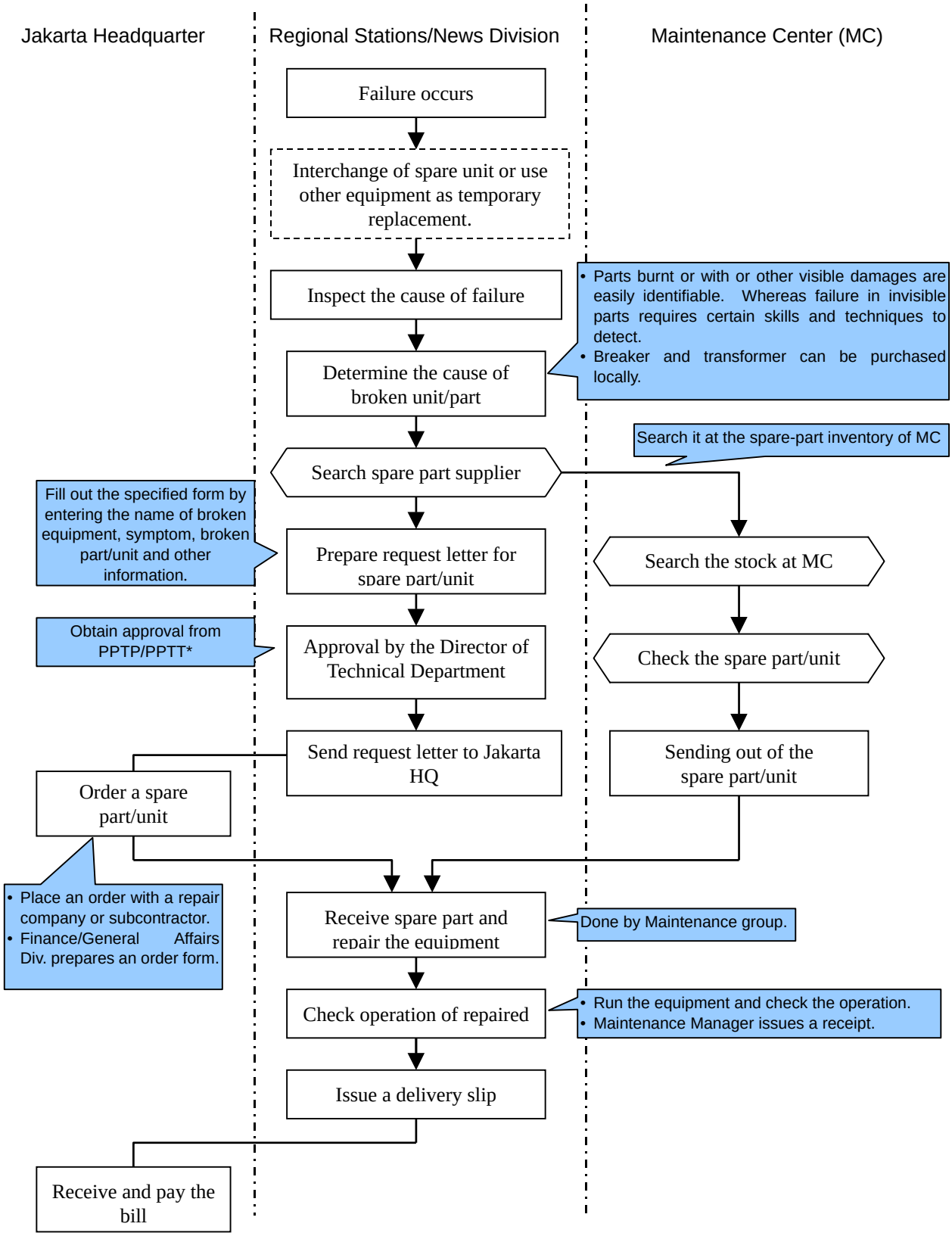
(1) Recommendations for Maintenance Work

- At present, only the application and delivery documents from/to regional stations on spare parts/units and monthly reports are being kept as records of maintenance work.

We recommend that a repair log for each equipment be kept according to the periodic maintenance schedule.

- Each studio has maintenance manuals that were prepared by extracting the maintenance portion from the equipment operation manuals provided by the equipment manufactures and translating them into the Indonesian language. Periodic maintenance should be done based on these manuals.

The chart below illustrate the maintenance (repair) work flow at each regional broadcast station and the News Division (Division II). Under this system, each division is performing clearly defined roles.



*PPTP: Maintenance group of technical production equipment
PPTT: Maintenance group of technical transmission equipment

Fig. 2-4-1 Repair Work Flow Chart

(In the case of using spare part/unit as an example)

2-5 Operation/Maintenance Cost of the Project after Implementation

2-5-1 Estimation of Maintenance Cost

The SAPI (Special Assistance Project Implementation by OECF) study conducted in 1997 on the Indonesian broadcasting sector reported a budgetary deficiency for the equipment maintenance at TVRI. The said deficiency is the necessary appropriation minus the actual appropriation. The amount of appropriation necessary was calculated as follows:

(1) The maintenance budget for broadcasting equipment should be proportional to the cost for renewing the equipment. The budget/renewal-cost ratio at TVRI is calculated at 1.6%.

(2) Based on empirical values among Japanese broadcasting stations and Indonesian commercial stations, the necessary maintenance budget was taken to be 1.7% (0.85% for the purchase of spare parts and 0.85% for miscellaneous spending) of the renewal cost in case where no equipment is superannuated.

(3) However, TVRI has more than a few superannuated pieces of equipment. According to the empirical values among Japanese stations, the maintenance budget needed for aged equipment should be 6.7% (5.85% for the purchase of spare parts and 0.85% for miscellaneous spending) of the renewal cost. Taking into account the ratio of aged equipment, TVRI's maintenance cost should be calculated at 1.96%.

Table 2-5-1 Maintenance/Renewal Cost Ratio of Broadcasting Equipment
(Source: SAPI Report)

	Actual ratio (%)	Target ratio (%)	Deficiency (%)
TVRI	1.6	1.96	0.36

This deficiency in the maintenance budget has been causing certain problems at TVRI, as was pointed out in the SAPI Report, but these had not yet been rectified at the time of our survey. To cover the additional maintenance cost to be incurred through the implementation of this project, 0.36 percentage points need to be added to TVRI's actual ratio for the following reasons:

- The maintenance budget is mainly used to purchase spare parts for equipment repairs.
- Equipment failure occurs frequently because of inadequate periodic maintenance.
- Spare parts and units are often purchased after the occurrence of equipment failures. When spare parts are not readily available, equipment is left unrepaired for long periods of time.

2-5-2 Maintenance Budget to be Appropriated at TVRI

As described in the previous section, the maintenance cost for non-superannuated broadcasting equipment is calculated at 1.7% of its replacement cost (0.85% for spare parts and 0.85% for periodic maintenance, etc.). However, as some of the equipment at TVRI is deteriorating, its maintenance cost should be adjusted to 1.96% of the replacement cost, which means there is a deficiency of 0.36 percentage points in the budget.

On the basis of these assumptions, we collaborated with our counterparts at TVRI to calculate the necessary maintenance budget. We consider that the following equations are reasonable for calculating the maintenance budget to be allocated to TVRI for the implementation of the project.

Table 2-5-2 Formula for Calculating Maintenance Cost at TVRI

Definition

A: Current Studio Maintenance Cost

B: Recommendable Maintenance Cost By SAPI

C: Replacement Cost for the project

D: The Replacement Cost (News Division Ⅱ) before the replacement

E:; Replacement Ratio in deteriorated Equipments in News Division Ⅱ after the replacement

χ: Target Maintenance Cost

Calculation

B=A+A×0.36% (0.36% is deficiency ratio by SAPI report)

$\chi = B + (C \times 1.7\%) - (D \times \frac{E}{100} \times 6.7\%) + (D \times \frac{1-E}{100} \times 6.7\%)$

∴ χ 18.6 billion Rp(A+ 0.1billion Rp)

Assumptions made in the calculation

A (Current equipment maintenance cost): approx. 18.5 billion Rp (derived from FY2000 balance sheet)

C (Replacement cost of the project): 50 billion Rp (1/2 of the requested amount of about100 billion Rp)

D (Replacement cost of equipment possessed by Division II): about20 billion Rp (estimated by our counterpart)

E (Improvement ratio of aged equipment before and after the project implementation): 80% (based on the survey sheet of existing equipment)

Result of calculation

χ (Maintenance cost required in the final year of the project) is estimated at about 18.6 billion Rp, an increase of about 0.1 billion Rp from FY 2000.

In calculating the maintenance cost, the figures substituted for the terms in the equations were derived as follows:

- A (Current studio equipment maintenance cost): 18.5 billion Rp - derived from the balance sheet of FY 2000 (Mechanical & Installation Expenses + Studio Equipment Expenses 9.47 billion + 9.05 billion 18.5 billion Rp)
- C (Equipment replacement cost of this project): about 100 billion Rp - based on the requested amount. Assuming the service life of broadcast equipment to be 10 to 15

years, the replacement cost of the equipment seven years after its installation would depreciate to 50 billion Rp (based on the generally-accepted depreciation schedule in Japan).

- D (Replacement cost of equipment possessed by Division II): about 20 billion Rp - this figure was provided by the counterpart who calculated the replacement cost of the existing equipment of Division II at the start of this project.
- E (Improvement ratio of aged equipment before and after the project implementation): 80% - based on the survey sheet of the existing equipment.

Based on the above equations and figures, the maintenance cost required by TVRI in the final year of the project is estimated at about 18.6 billion Rp, an increase of about 0.1 billion Rp (1 million yen) from the maintenance cost actually incurred in FY 2000.

The appropriateness of this estimation is verified by the following facts:

(1) Equipment acquisition and Maintenance Costs

As more broadcasting equipment is introduced, the overall maintenance cost will increase. Thus, there is a positive correlation between the acquisition cost and the maintenance cost of equipment. One Japanese broadcasting station uses this correlation to estimate its own operation/maintenance costs. However, it seems more appropriate in Indonesia to use the replacement cost (i.e. the cost for renewing the exiting equipment) instead of the acquisition cost for the following reasons.

- Most of the equipment are imported products, the prices of which are expressed in foreign currencies.
- Most of equipment are deteriorated due to long years usage and major devaluation on the Rupiah since equipment were purchased is not negligible.
- The inflation rate in Indonesia is high.

(2) Review of Appropriateness of the Replacement Cost Ratio

A certain broadcasting station in Japan assumes a value of 3% of equipment investment cost to calculate the operation & maintenance cost based on the going rate and past records.

The operation & maintenance cost of this Japanese station consists of the following:

Case of Japanese Station

(a) Cost for periodic maintenance
(b) Cost for replenishing spare parts
(c) Special repair cost (for aged equipment that has gone beyond its depreciation period)
(d) Cost for technical upgrades
(e) Power cost (electricity charges, fuel for in-house power generator)
(f) Cost for servicing and manning contingency equipment for election-related and other important programs
(g) Special maintenance costs during the new-year holidays and winter season
(h) Fees for governmental procedures
(i) Other costs (miscellaneous expenses, cost for meetings, etc.).

Of the above, TVRI's maintenance cost only covers items (a), (b), (c), and (d). Considering that (e) (the power cost) takes up 40% of the operation & maintenance cost here, and that items (f), (g), (h), and (i) are negligible in amount, 1.7% seems appropriate as the ratio of maintenance/replacement cost in Indonesia.

(3) Breakdown of 1.7%

In developing countries and semi-developed countries, including Indonesia, an effective maintenance system has yet to be established in general, and the maintenance work tends to take place at the time of equipment failure.

The table below shows the ratio of spare-parts/units cost versus the acquisition cost of equipment purchased in recent years.

Table 2-5-3 Purchase Cost of Spare Parts/Units in Developing Countries

(In US$)

	Total acquisition cost (A)	Average purchase cost of spare parts/units (B)	(B)/(A)	Region
Radio transmission equipment	4,000,000	19,000	0.48%	Asia
Radio studio equipment	2,800,000	25,790	0.92%	Asia, Africa
TV transmission equipment	500,000	6,500	1.3%	Central America
TV studio equipment	15,000,000	130,650	0.87%	Asia, the Middle and Near East
Total	22,300,000	181,940	0.82%	

The above figures were collected from the three major electric companies in Japan.

(A): The total acquisition cost of equipment

(B): The average cost per year for spare parts/units that were ordered from the customers four years after the installation of the equipment.

Note that the average purchase cost listed above includes the costs of service/spare parts (+shipping and handling) that were sent to the developing countries from the Japanese manufacturers following equipment installation. Estimating conservatively based on the above table, the spare-parts cost is around 0.85% of the acquisition (replacement) cost of the equipment.

The remaining 0.85% (1.7% minus 0.85%) is likely used for periodic maintenance and technical upgrading. Therefore, assuming that none of the equipment is aged, 1.7% (0.85% for spare parts and 0.85% for periodic maintenance and servicing) of the replacement cost seems an appropriate amount for the maintenance cost.

(4) Maintenance Cost of Aged Equipment

TVRI is using more than a few aged pieces of equipment that have gone beyond their service lives. Although the average life of broadcasting equipment is said to be around 15 years, the actual service life may be shorter, considering the rapid progress of digital technology and speedy development of new products. Also, taking into account that broadcasting equipment depreciates over seven years and that the supply of spare parts will not be guaranteed after ten years, the actual service life of the equipment is more likely to be around ten years. Based on the experience at the broadcasting station in Japan in our example, the maintenance cost of broadcasting equipment is said to increase by 5% of the purchase cost after the expiration of its service life. This means that 1.7%

+ 5% = 6.7% (5.85% for spare parts and 0.85% for periodic servicing, etc.) will be needed for maintaining aged equipment.

Taking into account the existence of aged equipment, the SAPI Report estimates the ratio of maintenance cost of TVRI's equipment at 1.96% of its replacement cost.

2-5-3 Estimation of Operation Cost

Operation cost mainly consists of electrical charges and the purchase cost of videotapes.

(1) Estimation of Electrical Charges

As shown in the table below, the additional electrical demand that will be created by the introduction of new equipment through this project is 15.3kW.

According to the local procurement status study, the power rate for factories is 150 Rp/kWh (whereas that for regular households is 93.4 Rp/kWh). If TVRI runs the equipment up to 24 hours a day, it will incur about 55,000 Rp per day or about 20,000,000 Rp of additional charges per year.

15.3 kW×150 Rp/kWh × 24 hours 55,000 Rp/day

55,000 Rp/day × 365 days 20,075,000 20,000,000 Rp/year

Table 2-5-4 Increase in Power Demand after Implementation of the Project

No.	Name of requested equipment	Capacity per unit	No. of units to be added	Increase of power demand after project implementation
A	1:1 VTR editing system	0.9kVA	2 units	1.8kVA
B	A/B roll VTR editing system	2.3kVA	2 units	4.6kVA
C	Non-linear editing system	1.8kVA	1 unit	1.8kVA
D	On-air VTR editing system	1.2kVA	1 set	1.2kVA
E	Foreign program recording system	1.5kVA	—	—
F	Camera shooting system, camcorder & peripheral equipment	—	—	—
G	Studio recording VTR system	1.3kVA	1 set	1.3kVA
H	Character-generator/computer-graphics system	0.8kVA	1 set	0.8kVA
I	Broadcast tape storage system	3.8kVA	1 set	3.8kVA
Total				15.3kVA

(2) Cost for Videotapes

In introducing the broadcast tape storage system under this project, appropriations need to be made for purchasing a sufficient number of videotapes to be stored each year. Under the current system, four persons are performing the cataloging operation and database entry on a 24-hour/day basis, being capable of organizing up to 12 cassette tapes per day.

To maintain the current system after the implementation of the project, a total of 6,480 digital tapes will be needed. This number is comprised of 4,320 tapes per year (12 tapes/day × 30 days/month × 12 months/year) for cataloging and 2,160 tapes (6 tapes/day × 30 days/month × 12 months/year) for digitization (before cataloging) (see Fig. 2-2-4).

According to the local procurement status survey, one digital tape costs 220,000Rp, and the News Division spent about 4,037 million Rp for purchasing tapes in FY 2000. Since the videotape cataloging system will use 4,320 tapes per year (12 tapes/day × 30 days/month × 12 months/year), it will incur about 950 million Rp per year (220,000 Rp/tape × 4,320 tapes/year), accounting for about 23% of the total cost for tapes in FY 2000.

Additional budget to be appropriated after the implementation of this project will be for the upgraded/expanded portion of the broadcast tape storage system, by which the efficiency of cataloging work will be improved. In other words, the cost for 2,160 tapes (6 tapes/day × 30 days/month × 12 months/year) for digitization (before cataloging), or about 475 million Rp (2,160 tapes/year × 220,000 Rp/tape) will be incurred as additional expense.

2-5-4 Personnel Cost

TVRI's News Division (Division II) is staffed by 302 employees. In upgrading and expanding their news broadcasting equipment, the quantity of new equipment should be appropriate for the size of the current staff.

(1) ENG Camera (Camera Shooting System, Camcorder & Peripheral Equipment)

Of the requested items, we have figured that 19 ENG cameras will be needed for this project. Of 31 ENG cameras currently owned by TVRI, 19 will be replaced with new ones, and three will be brought in from other locations. As a result, TVRI will have 22 cameras after the implementation of the project.

A news crew is comprised of a cameraman, a reporter, and a lighting technician. If the News Division is to operate 22 cameras, 22 teams, each having one cameraman, one reporter, and one lighting technician, need to be organized. While cameramen and reporters are required to have certain skills and experiences, lighting technicians can be part-time workers or those in an assistant capacity as is the case with Japanese TV crews. Since the News Division employs enough numbers of cameramen (51) and reporters (117), the number of ENG cameras to be procured under this project will be appropriate for the size of the current staff, requiring no additional personnel.

(2) 1-to-1 and Non-Linear Editing Systems

Generally, each editor occupies and operates one VTR editing system or non-linear editing system. Under this project, a total of seven 1-to-1 editing systems will be operated, of which five systems (three for replacing existing ones and two as new addition) will be procured, and two systems will be brought in from other locations. This project will also operate two non-linear systems; one will be newly installed, and another will be transferred from another location.

To operate seven 1-to-1 editing systems and two non-linear systems, at least seven editors will be needed. The News Division currently employs 24 editors working in rotation. Even though they also perform dubbing operations, they can handle nine editing systems without requiring additional editors.

(3) A/B Roll Editing System and Character-generator/Computer-graphics System

Although two A/B roll digital editing systems were requested, this project will install one new digital system and relocate and use one existing system. Two character-generators systems will be provided for the new and existing editing systems, which will be operated by the editors. Considering that the A/B roll editing system is used less frequently than the 1-to-1 editing system, and that a sufficient number of editors are being employed as described under section (2) above, the quantity of the equipment is appropriate to the size of the current staff, with no need for any additional personnel.

(4) Broadcast Tape Storage System

Under the current filing system, four persons are performing the cataloging operation and database entry on a 24-hour/day basis, organizing 12 cassette tapes per day.

The scale of the new system will be so designed that it will be operated under the current production system without the need for additional personnel.

2-5-5 Operation & Maintenance Cost

The operation & maintenance cost is estimated at around six million yen as itemized below. The estimated cost is not exceeding the amount indicated on the Memorandum and should be feasible for the most part.

Maintenance:	100,000,000 Rp	
Operation:	495,000,000 Rp	
(Power charge	20,000,000 Rp)	
(Videotapes	475,000,000 Rp)	
Total	595,000,000 Rp (	6 million yen)

2-6 Other Relevant Issues

2-6-1 Introduction of Soft Components in the Project

(1) Necessity for Introducing Soft Components

Through the provision of news production equipment under this project, the News Division's equipment in TVRI, for instance, cameras, editing systems, news studio equipment, and on-air VTRs, will be completely digitized.

Since this project aims to enhance the production and broadcasting capabilities of TVRI's News Division, it is important that the new digital equipment and associated technology will be fully utilized to produce and broadcast new programs with improved quality. To ensure this, the introduction of soft components (=technical guidance for program production) by consultants will be necessary.

(2) Outline of Soft Component Implementation in the Project

- Technical advisors will be dispatched to provide guidance on TV production.
- The advisors will be dispatched twice: two months prior to the beginning of installation work and at the time of equipment installation.