BELLCOMM, INC.
955 L'ENFANT PLAZA NORTH, S.W. WASHINGTON, D. C. 20024

B69 05001

SUBJECT: Description of MSC/News Media Television Interface for Apollo 8 and 9 - Case 320

DATE: May 1, 1969

FROM: H. Kraus

ABSTRACT

Newsworthy events and activities which occur during manned spaceflight missions are made available to the news media by the Public Affairs Officer (PAO) at the Manned Spacecraft Center (MSC). This memorandum describes the television video interface between MSC and the commercial television broadcasting networks. Scan-converted spacecraft video and MSC originated video are released by the PAO to a pool formed by the three major television broadcasting networks. The actual MSC/news media television interface occurs at the output of a set of distribution amplifiers located in Building 1 at MSC. The "pool" video is sent off-site using MSC-owned facilities to a Television Operations Center (TOC) in Houston, Texas. From Houston the video signal is sent to a similar TOC in New York City (via commercial microwave relay) where it is distributed to each of the television networks.

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MEMORANDUM FOR FILE

Introduction

Newsworthy events and activities which occur during manned spaceflight missions are made available to the news media in real or near-real time by the Public Affairs Officer (PAO) at the Manned Spacecraft Center (MSC) at Houston, Texas. These releases include spacecraft television and audio, and Mission Control Center (MCC) scenes narrated by the PAO. Releases of pre-launch and launch information are made by the Kennedy Space Center (KSC).

This memorandum describes the television interface between MSC and the commercial television broadcasting networks for the Apollo 8 and Apollo 9 spacecraft television transmissions.

Background

The television system on board the Apollo spacecraft transmits video signals from the spacecraft to Manned Space Flight Network ground stations over the Unified S-Band system. At appropriately instrumented MSFN stations, (usually at Cape Kennedy, California, and Spain) the received television video is converted from the Apollo television format to the standard commercial television format. The Apollo television format of the signal transmitted by the spacecraft consists of frames of 320 lines (non-interlaced) at a rate of 10-frames/second etc. The standard commercial television format is a 525-line/frame with a 2:1 interlace and a rate of 30-frames/second. The scan converted video is transmitted from the receiving ground station(s) to MCC using standard commercial-television circuits. At MCC, the spacecraft television video from all receiving ground stations is viewed by the Flight Operations Division Television Editor (FOD-TV) who selects the best presentation available. The selected presentation is then made available to MCC Flight Controllers, PAO and other personnel at MSC. The PAO makes the spacecraft and other MCC television video signals available to a "pool" formed by the three major television networks (ABC, CBS, and

NBC). The pool video is routed to a television operations center in New York City where it is made available to each of the networks for broadcast to the general public. Video control equipment for the pool facilities is provided by one of the broadcasting networks on a rotating basis from mission to mission.

PAO Television Signal Routing

Routing of PAO television video signal inputs and the PAO "release" video within MSC is shown in Figure I. The PAO switching matrix (20 inputs by 5 outputs) also receives television video inputs from within the MCC and from the Kennedy Spacecraft Center as listed in Table I. Apollo spacecraft television signals (in standard 525-line format) are received from the Merritt Island station (GMIL) at KSC, the Goldstone, California station, and the Madrid, Spain station. These inputs are routed to the FOD-TV Editor input-select matrix* where the desired input signal is selected for presentation to the PAO switching matrix and to the Flight Control Team and other personnel at MSC. Other television video inputs include PAO cameras providing views of the Mission Operations Control Room and the output of video tape recorders.

The outputs of the PAO switching matrix are listed in Table I also. Of interest is the "PAO Release" output which makes the television video signals available to the news media. This signal path goes through a PAO Enable Relay which is controlled by both the PAO and the FOD-TV Editor, with the latter having override capability for editing purposes. From the PAO Enable Relay, the signal leaves the MCC and goes to the Southwestern Bell Telephone Company facility at MSC (Building 47) and to the MSC television control center in Building 8. A diagram showing the television audio and video cables layout from Building 8 is presented as Figure II.

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*Note: The FOD-TV Editor input-select matrix was not installed during the Apollo 7 mission. Spacecraft television signals were routed direct to the PAO switching matrix where selection was made by the FOD-TV Editor.

In Building 47 the signal is routed to a video switcher which is used as a distribution amplifier. Also coming into Building 47 and routed to a distribution amplifier configured video-switcher is the "PAO Clock" television video. Some of the outputs of the Building 47 switchers are sent to news media monitoring and operations locations in the Nassau Bay Development area (adjacent to but external to MSC) for monitoring purposes only. The PAO Release and PAO Clock video are routed to the MSC Auditorium (Building 1) via a "tie-point" located in a telephone equipment room in Building 2 at MSC. At Building 1 additional monitor-only taps are provided for the news media and NASA personnel. The news media "pool van" is located outside of Building 1 and coaxial lines are used to connect the two television signals to the van-input connections. The output of the pool van is a single television video signal which is routed through Building 1 to Building 47 where it is sent to the Houston Television Operations Center (TOC) via an L-3 Carrier System over buried cables. From Houston the television signals are routed to New York via microwave relay.

The actual MSC/News Media television interface occurs at the output of the distribution amplifiers in Building 1 which feed the pool van. The facilities used to connect the pool van to the Houston TOC are MSC-owned but are paid for by the news media. The pool video and other unilateral video (programming originated by only one of the networks) are transmitted to the Houston TOC using spare channels available in the L-3 carrier system connecting MSC to the Houston Long Lines Office. The news media are allowed to utilize these spare-channel facilities with the understanding that NASA will have priority on the utilization of the system in the event of any malfunctions or other problems.

Original Signed By

2034-HK-sjs H. Kraus

TABLE I

PAO Switching Matrix Inputs and Outputs

Input Channel		Output Channel	
1	KSC Television	1	Video Tape Recorder #1 Input
2	PAO Return	2	Video Tape Recorder #2 Input
3	Standards Converter Output	3	PAO Release
4	Second Floor World Map	4	Television Monitor
5	Standards Converter Output	5	Television Monitor
6	Standards Converter Output		
7	FOD-TV Editor Output		
8	Third Floor World Map		
9	Third Floor PAO Rear Camera		
10	Second Floor PAO Rear Camera		
11	Video Tape Recorder #1 Output		
12	Video Tape Recorder #2 Output		
13	(unidentified input)		
14	(unidentified input)		
15	(blank)		
16	Special Effects Output		
17	Third Floor PAO Front Camera		
18	Second Floor PAO Front Camera		
19	(blank)		
20	(blank)		

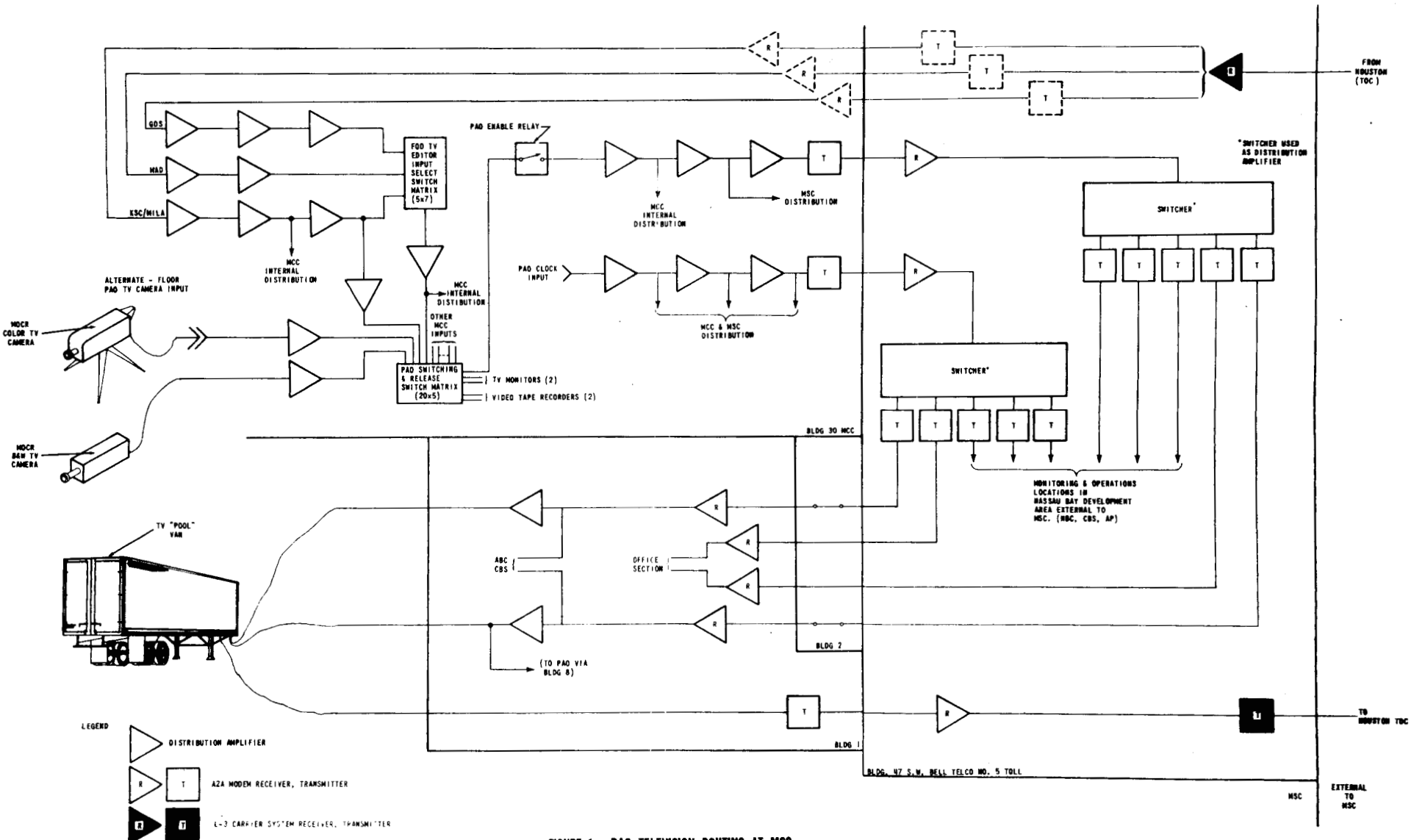

FIGURE 1 - PAO TELEVISION ROUTING AT MSC

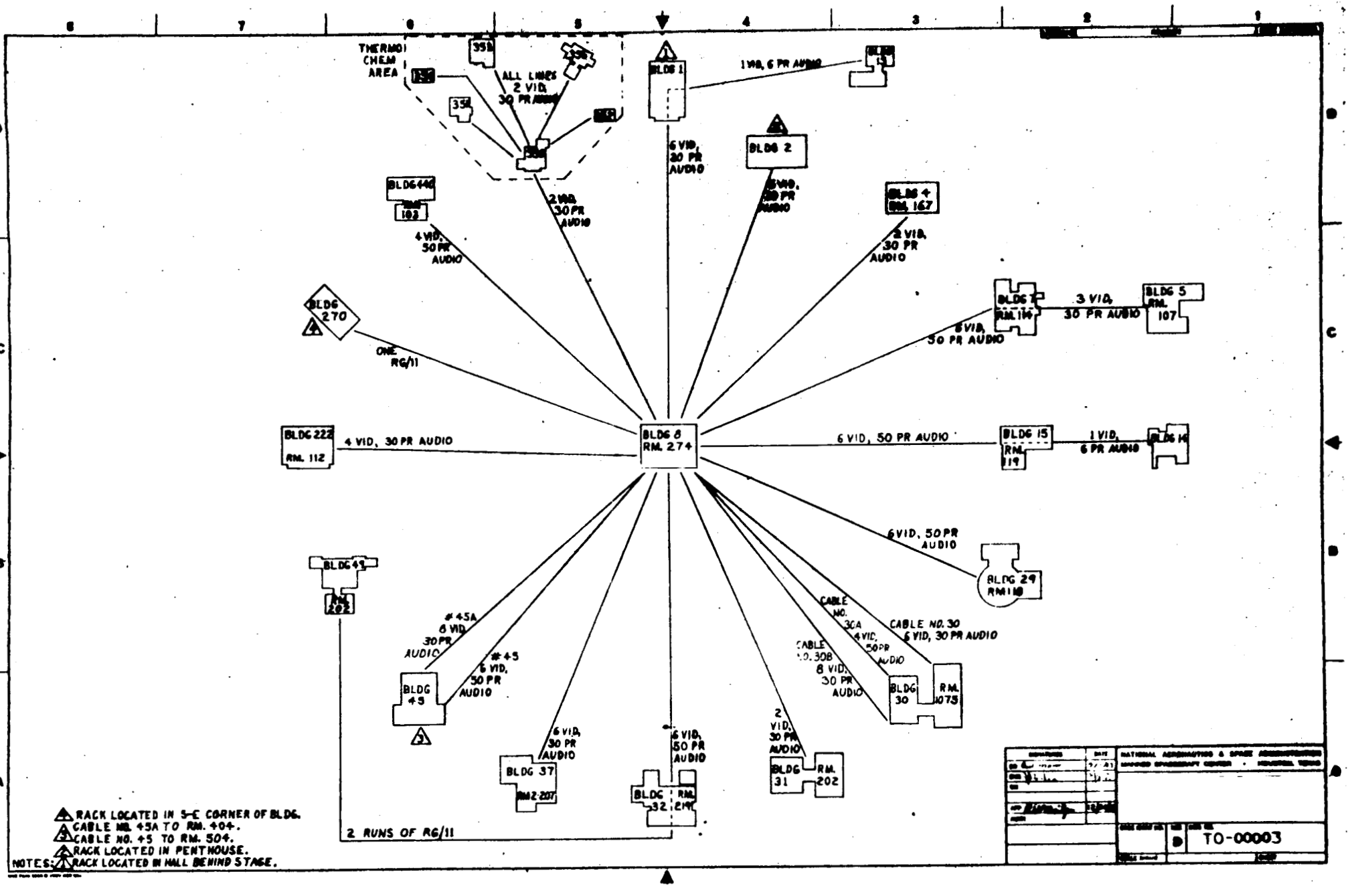

FIGURE II - MSC TV AUDIO AND VIDEO CABLES LAYOUT

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