APOLLO SOYUZ TEST PROJECT (ASTP)

TEST PLAN/PROCEDURE FOR THE CHECKOUT OF THE USA CABLE COMMUNICATIONS TEST CONFIGURATION FOR THE ELECTROMAGNETIC COMPATIBILITY (EMC) TESTS

Job Order 17
Task Order 060

Prepared By

Lockheed Electronics Company, Inc.
Aerospace Systems Division
Houston, Texas

Contract NAS 9-12200

For

SPACECRAFT SYSTEMS TEST OFFICE
TRACKING AND COMMUNICATIONS DEVELOPMENT DIVISION

National Aeronautics and Space Administration

LYNDON B. JOHNSON SPACE CENTER

Houston, Texas
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(See instructions on reverse side.)

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13. ABSTRACT

Test specialists from the United States of America (USA) and the Soviet Union will conduct a series of electromagnetic compatibility (EMC) tests in May, 1975 in the Soviet Union. The purpose of the EMC tests is to determine the effects of the operating environment of the Soviet aircraft, Soyuz, upon the electrical performance of the USA's cable communications equipment located in Soyuz.

This publication includes the test procedures necessary to check out the USA Cable Communications Test Configuration in preparation for the EMC tests.

14. SUBJECT TERMS

Apollo - Soyuz Test Project (ASTP)

PREFACE

This publication includes the test procedures necessary to check out the USA Cable Communications Test Configuration in preparation for the Electromagnetic Compatibility (EMC) Tests. The EMC tests will be conducted in the Soviet Union in May, 1975. These tests in the Soviet Union will determine the effects of the Soyuz spacecraft's environment on the performance of all USA cable communications equipment located in the Soyuz spacecraft.

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J. Calvin Perry, of the Spacecraft Systems Test Section of Lockheed Electronics Company, Inc., prepared this document.

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ACRONYMS AND ABBREVIATIONS

ASTP	Apollo Soyuz Test Project
CCHS	Communications carrier headset
CCU	Communications carrier umbilical
CM	Command Module
CWG	Constant wear garment
DAC	Data acquisition camera
DM	Docking module
EMC	Electromagnetic compatibility
TV	Television
USA	United States of America
Vdc	Volts direct current
VTR	Video tape recorder
mm	Millimeter

TEST PLAN/PROCEDURE FOR THE CHECKOUT OF THE USA CABLE COMMUNICATIONS TEST CONFIGURATION FOR THE ELECTROMAGNETIC COMPATIBILITY (EMC) TESTS

1.0 INTRODUCTION

Test specialists from the United States of America (USA) and the Soviet Union will conduct a series of EMC tests in May, 1975 in the Soviet Union. The purpose of the EMC tests is to determine the effects of the operating environment of the Soviet spacecraft, Soyuz, upon the electrical performance of the USA's cable communications equipment located in Soyuz.

Communications equipment located in Soyuz consists of a speaker box, two communications carrier headset (CCHS) assemblies, a television (TV) camera and TV monitor, and a 16-millimeter (mm) data acquistion camera (DAC). All of these items interface into a Soviet furnished "USA J-Box". The USA J-Box interfaces with the USA docking module (DM) and command module (CM) spacecraft (when Soyuz is docked to the CM's DM) via electrical signal and power cables. These electrical signal and power cables provide 28 volts direct current (Vdc) power to the USA J-Box, and provide voice and television signal paths between the USA J-Box and the CM/DM.

An actual CM/DM will not be available in the Soviet Union during the EMC tests. Therefore, in order to evaluate the performance of the USA's cable communications equipment while operating in the Soyuz environment, a

simulated ASTP Cable Comm and Audio System Simulator was designed and constructed. This test device interfaces with Soyuz via an interface cable. It consists of a simulated CM and DM audio system and provides a video output from the USA J-Box in Soyuz. The simulated CM and DM audio system is used to provide a means of monitoring/ evaluating the performance of all audio equipment in Soyuz. The video output is used to provide a means of monitoring/ evaluating the performance of the TV equipment located in Soyuz.

The test procedure provided herein, first contains a brief description of the ASTP Cable Comm and Audio System Simulator and the USA cable communications system in Soyuz. Also included are the test objectives, pretest activities, and the test procedures necessary to check out all equipment associated with the EMC tests.

2.0 SYSTEM DESCRIPTION

This system description contains a brief description of power requirements for the EMC test configurations, a brief description of the ASTP Cable Comm and Audio System Simulator, and a description of the USA cable communications in Soyuz.

2.1 SYSTEM POWER REQUIREMENTS

The system power requirements can best be understood by referring to figure 1. As shown, there are a total of four power supplies required. Note that Power Supply 2 furnishes power to all the USA cable communications equipment located in Soyuz, and that the power is controlled within the ASTP Cable Comm and Audio System Simulator. The power supplies shown will be furnished by the Soviets during the EMC tests in the Soviet Union.

2.2 ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR

A block diagram of the ASTP Cable Comm and Audio System Simulator (hereafter called the Simulator) is shown in figure 2. The Simulator consists primarily of a CM type audio center and three control panels, two of which are CM type control panels (Panels 6 and 9). Within the Simulator is a simulated DM area consisting of microphone, earphone, TV, and VHF/FM transmitter jacks.

Power is supplied externally to the Simulator via one power supply. A second power supply which furnishes power to the USA cable communications system in Soyuz is controlled within the Simulator. Another feature of the Simulator is that all wiring interfacing with Soyuz is fused. This is to protect all Soyuz spacecraft wiring in the event an electrical short should occur during the EMC tests.

2.3 USA CABLE COMMUNICATIONS IN SOYUZ (OR TEST EQUIVALENT MOCKUP)

A block diagram of the USA cable communications in Soyuz is shown in figure 3. The system is comprised of a cable link to the USA J-Box, and from the USA J-Box, the audio, TV, and movie camera equipment are connected. The audio equipment consists of a speaker box and two CCHS assemblies. TV equipment consists of a TV camera and a TV monitor. The movie camera is denoted a 16-mm DAC.

The performance of this equipment will be evaluated during the EMC tests. All evaluations will be made outside Soyuz via the Simulator.

3.0 TEST OBJECTIVES

The objectives of the following test procedures are intended to perform three distinctively different tasks. When all of these tasks have been accomplished, the EMC test system will be ready for evaluating the performance of the USA cable communications system while operating in the Soyuz environment.

The first test (see section 5.1) will check the operation of the Simulator. Successful checkout of the second test will assure that the Simulator and the USA J-Box (as a system) are ready to interface with the USA communications equipment located in Soyuz (or the test equivalent mockup). The third test is a preliminary or "dry run" of the EMC tests prior to operating the USA cable communications system in the Soyuz environment.

4.0 PRETEST ACTIVITIES

The pretest activities consist of gathering and setting up all required equipment to support the tests that are set forth in this document and of verifying the proper operation of all support equipment not included in section 5.0 of this document.

4.1 EQUIPMENT REQUIRED

The equipment required to perform the required tests is listed in figure 4. Note that there are seventy-five items; items 23 and 25 (tools and spare parts) are not fully required to perform the tests, however, they will be necessary in case of equipment malfunctions.

4.2 OPERATIONAL VERIFICATION OF SUPPORT EQUIPMENT

The operational verification of support equipment includes primarily all active devices not tested in section 5.0. They are as follows (reference figure 4):

Equipment Item	Figure 4 List No.
Audio Recorder	57 and 75
Scope	58
RMS Voltmeter	59
Scope	60
DC-to-AC Converter	61
Black and White TV Monitor	62
Black and White Video Tape Recorder (VTR)	63
Speaker	64

5.0 TEST PROCEDURE

This section provides procedures to test (or checkout) three primary categories/items of the EMC test system. The successful completion of the first procedure (section 5.1) assumes that the ASTP Cable Comm and Audio System Simulator is operating properly. Completion of the second procedure (section 5.2) confirms that the integration of the ASTP Cable Comm and Audio System Simulator with the Soyuz Interface Cable and the USA J-Box is correct, and that the USA cable communications equipment is ready to interface with the USA J-Box. The third procedure (section 5.3) integrates and operates the entire cable communications with all the EMC terminal test devices. Section 5.3 also provides baseline data so that the operation of the system can be compared with its operation inside the Soyuz environment.

5.1 SYSTEM CHECKOUT OF ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR

1. Configure the ASTP Cable Comm and Audio System Simulator (hereafter called the Simulator) per table I.
2. Remove the FUSE panel cover from the Simulator.
3. Verify/install fuses in fuse holder F1 through F19 per table II.
4. Soviet power interface checks:
   a. Measure and verify the following direct current (dc) power supply sources. Use a volt-ohm meter as specified in figure 5.

- Power Supply 1: 28 ± 1 volts dc (Vdc), 1.5 ampere capability.
- Power Supply 2: 28^{+4}_{-3} Vdc, 4.0 ampere capability.

5. If the above voltages are within the specified limits, configure per figure 5, making sure that output power is removed from Power Supplies 1 and 2.

6. Apply 28 Vdc power to Power Supplies 1 and 2.

7. Using the volt-ohm meter specified in figure 5, verify the voltages at the test points specified in table III under column entitled, "Voltage Measurements with 28 Vdc Audio and Soyuz Interface 28-Vdc Power Circuit Breakers OFF".

8. Switch the 28-Vdc Audio and the Soyuz Interface 28-Vdc circuit breakers to the ON position.

9. Using the volt-ohm meter specified in figure 5, verify the voltages at the test points specified in table III under column entitled, "Voltage Measurements with 28 Vdc Audio and Soyuz Interface 28-Vdc Power Circuit Breakers ON".

10. Set the SUIT POWER switch on Panel 6 to the ON position. Connect the ASTP CCU Test Unit to J647. Using the volt-ohm meter specified in figure 5, verify the voltages at the test points specified in table IV. Turn SUIT POWER switch to OFF upon completion of table IV measurements.

11. Repeat step 10, except connect the communications carrier umbilical (CCU) test unit to J646, and utilize Panel 10.

12. Repeat step 10, except connect the ASTP CCU Test Unit to J645, and utilize Panel 9.

13. Apply resistive loads as specified in table V.

14. Set POWER selector switches to AUDIO on Control Panels 6, 9, and 10.

15. Configure the ASTP CCU Test Unit, the oscilloscope, and the rms voltmeter as shown in figure 6. All measurements shall be determined from the rms voltmeter.

16. Connect the ASTP CCU Test Unit to J645(9) of the Simulator.

17. Measure and record the voltages at the test points specified in table VI for those controls associated with Panel 9.

18. Connect the ASTP CCU Test Unit to J646(10) of the Simulator.

19. Measure and record the voltage at the test points specified in table VI for those controls associated with Panel 10.

20. Connect the ASTP CCU Test Unit to J647(6) of the Simulator.

21. Measure and record the voltages at the test points specified in table VI for those controls associated with Panel 6.

22. Configure per figure 7.

23. Remove the 2.8K ohm load from the ASTP CCU Test Unit's MIKE jack.

24. Make and record all measurements as specified in table VII.

25. Reconfigure per table I and figure 8.

26. Don the CCHS's on three people.

27. Note the position of the MODE switch on each of the control panels. Refer to table IX, and operate the MODE switches in the desired position, noting that each condition operates properly by utilizing the headsets and the oscilloscope.

28. Ensure that the MODE switches on each control panel are in the INTERCOM/PTT position.

29. Refer to table X, and operate the switches in the sequence and positions shown. Observe that the requirements are met as specified in the table.

30. Configure the control panels per table I.

31. This completes the checkout of the ASTP Cable Comm and Audio System Simulator.

5.2 CHECKOUT OF THE USA CABLE COMMUNICATIONS SYSTEM FOR EMC TEST PREPARATION

NOTE: Prior to performing this checkout, the test, System Checkout of ASTP Cable Comm and Audio System Simulator (section 5.1), should be performed.

1. Verify that the following Soviet furnished direct current (dc) power supply sources have voltages within the tolerances specified.

   a. Power Supply 1: 28 ± 1 Vdc, 1.5 ampere capacity.

   b. Power Supply 2: 28^{+4}_{-3} Vdc, 3.6 ampere capacity.

c. Power Supply 3: 24 Vdc to 27 Vdc, 4.0 ampere capacity.

d. Power Supply 4: 12 Vdc, 3.0 ampere capacity.

2. If the above voltages are within the specified limits, configure the ASTP Cable Comm and Audio System Simulator (hereafter called the Simulator) per table I.

3. Configure the system per figure 9, using Soyuz Interface cable, SN1001.

4. Refer to table XI and perform the continuity checks as specified. Before starting the checks, ensure that the output power is removed from Power Supplies 1 and 2.

5. Set the Simulator's SOYUZ INTERFACE 28-Vdc circuit breaker to OFF.

6. Remove the Simulator's fuse panel cover and remove the following fuses: F1, F2, F7, F12, F15, F16, F17, F18, F19.

7. Measure and record the resistance between one terminal of the fuse socket and the ASTP cable communications Test Unit no. 3 terminals as specified in table XII.

8. Reinstall the fuses removed in step 6 and reinstall the fuse panel cover.

9. Refer to table XIII and perform the indicated voltage checks. Before beginning, ensure that 28-Vdc power is available at the outputs of Power Supplies 1 and 2.

10. Remove power from the outputs of Power Supplies 1 and 2.

11. Set the Simulator's SOYUZ INTERFACE 28-Vdc circuit breaker to OFF.

12. Configure per figure 10.

13. Refer to table XIV and perform the continuity checks as specified. Record the data.

14. Apply power at the outputs of Power Supplies 1 and 2.

15. Refer to table XV and perform the voltage checks as specified. Record the data.

16. Signal Crosstalk Measurements. – Signal crosstalk tests will consist of applying a zero dBm, 1 kHz, sine wave signal to each pair of properly loaded audio and TV signal lines and measuring the resulting crosstalk on every other pair of audio and TV signal lines which have been properly terminated. The resulting crosstalk signal must fall below established limits.

    Procedure. – The following procedure will be utilized to test for signal crosstalk.

    - The J-Box power switches will be in the OFF position and the Simulator circuit breakers will be in the OFF position.
    - The tests will be conducted between the Simulator interface connectors, DM TV and J647(6), and the USA J-Box connectors, AUDIO 1 and the TV SIGNAL jack.
    - The test equipment will be capable of providing a 0-dBm 1-kHz sine wave signal from a balanced (floating) 600-ohm source into the Simulator interface connectors, DM TV and J647(10) (via ASTP CCU Test Unit at J647(10)). The testing will be

conducted with a balanced (floating) 600-ohm load connected to J-Box connector, AUDIO 1 (via the ASTP CCU Test Unit) and the end of the TV SIGNAL jack. The measuring device (voltmeter) and 600-ohm load will be of the floating type (ungrounded) and will be connected to the Simulator interface connectors DM TV and J647(6) (via the ASTP CCU Test Unit at J647(6)).

- Typical test setup for measuring audio and TV signal line crosstalk is shown in figure 11.
- The individual test steps are shown in table XVI.
- The measured crosstalk will be at least 50 dB below the applied signal level.

17. Repeat step 3 except use Soyuz interface cable, SN 1001.

18. Repeat step 4 through 11 and step 16 using Soyuz interface cable, SN 1001.

19. This completes the test "CHECKOUT OF THE USA CABLE COMMUNICATIONS SYSTEM FOR EMC TEST PREPARATION."

5.3 CHECKOUT OF EMC TEST SYSTEM

1. Configure audio system simulator and test equipment per figure 4 (figure 1 of document no. USA-WG4-658) by performing the following steps:

   a. Set all equipment power switches to OFF

   b. Set audio system simulator switches according to table I.

c. Connect all items as shown in figure 4 with the exception of:

- DC power sources
- Soyuz interface cable
- Terminal devices and cables at USA J-Box

2. Connect power to audio system simulator and test equipment by performing the following steps:

a. Turn on dc power sources; verify proper voltages and polarity using a volt-ohm meter.

- Power supply 1: 28 ± 1 Vdc, 1.5 amp capability
- Power supply 2: 28^{+4}_{-3} Vdc, 4.0 amp capability
- Power supply 3: 12 ± 1 Vdc, 3.0 amp capability
- Power supply 4: 24-27 Vdc 4.0 amp capability

b. If above voltages are within the specified limits, remove output power and connect power sources per figure 4.

c. Apply dc power to audio system simulator and to test equipment.

3. Configure audio system simulator by setting the listed controls as follows:

a. Audio center 28 Vdc circuit breaker to ON.

b. Panel 6:

- S-band T/R
- S-band volume 5
- Power Audio
- Master volume 5
- Intercom T/R
- Intercom volume 5
- Suit power ON

c. Panel 9:

- Power Audio
- Master volume 5
- Intercom T/R
- Intercom volume 5
- Suit power ON

d. Panel 10:

- Power Audio
- Master volume 5
- Intercom RCV
- Intercom volume 5

e. Conduct communications check between Panel 9 (J645) and Panel 6 (J647); verify reception on Panel 10 (J646) earphone.

f. Set Panel 6 suit power to OFF; disconnect CCHS/CCU assembly from J647.

4. Configure Soyuz equivalent by performing the following steps:

a. Verify Soyuz interface 28-Vdc circuit breaker in OFF position.

b. Set USA J-Box and terminal device switches as follows:

- J-Box:

  Audio power OFF
  TV & utility power OFF

- Speaker box:

  Power OFF
  Speaker/Headset Speaker
  Signal/OFF Signal

- TV camera: Linear, Master, Average
- TV monitor: OFF

c. Connect Soyuz interface cable to Soyuz equivalent system per figure 4. (P3 to J3)

d. Connect terminal devices to USA J-Box per figure 4 in the following sequence:

- Assemble CCHS/CCU/T-adapter and connect to AUDIO 1
- Connect speaker box to AUDIO 2
- Assemble DAC/power cable/adapter and connect to UTILITY POWER connector
- Assemble functional TV/cable/adapter and connect to TELEVISION SIGNAL and POWER connectors.

5. Power up remaining test equipment by performing the following steps:

a. Turn on all continuously powered test equipment. Allow warmup prior to proceeding.

b. Set Soyuz interface 28-Vdc circuit breaker to ON.

6. Carry out series 1 measurements in accordance with USA-WG4-658 by performing the following steps:

NOTE: The acceptability of the measurements and observed results will be based on subjective evaluation and engineering judgment. No quantitative limits are set.

a. Set USA J-Box and terminal device switches as follows:

- J-box:

Audio power	ON
TV and utility power	ON

- TV monitor: ON
- Audio system simulator
  Panel 6 MODE: Intercomm/PTT

b. Adjust TV lens zoom, iris and focus for acceptable video output. Adjust mini-monitor for good display.

c. Simultaneously conduct audio and TV measurements in accordance with tables I and II of USA-WG4-658.

d. Set speaker box power to ON. Adjust volume while giving test count from Panel 9.

e. Hold or lock speaker box key to transmit.

f. Repeat audio measurements.

g. Operate DAC (24 frames/second) and 35mm flash, and repeat audio and TV measurements.

h. Release speaker box key and repeat audio measurements while operating DAC.

7. Carry out audio quality evaluation in accordance with USA-WG4-658 by performing the following steps:

a. Remove CCU from audio system simulator J646 and replace with ASTP CCU test unit.

b. Remove audio recorder input cable S-AU-1 from PANEL 818 MIKE and connect to ASTP CCU Test Unit EARPHONE. Record during steps 7c and 7d.

c. Conduct communications check between Panel 9 and USA J-Box using both CCHS and keying XMIT.

d. Repeat communications check using speaker box, keying XMIT.

e. Turn off speaker box power and audio power on J-Box.

f. Disconnect speaker box from AUDIO 2 and connect OTHER speaker box. Turn on audio power on J-Box and speaker box power.

g. Repeat 7d.

8. Power down and disassemble equipment by performing the following steps:

a. Set terminal device switches as follows:

- TV monitor OFF
- Speaker box power OFF

b. Set USA J-Box switches as follows:

- Audio power OFF
- TV and utility power OFF

c. Set Soyuz interface 28-Vdc circuit breaker to OFF.

d. Configure audio system simulator in accordance with table I.

e. Set all test equipment power switches to OFF.

f. Turn off the dc power sources.

g. Disconnect and disassemble all equipment. Handle individual items as required.

TABLE I.— CONFIGURATION OF THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR FOR INITIAL CHECKS

Panel No./ Function	Switch/Control	Position	Panel No./ Function	Switch/Control	Position
9	Mode	PTT	6	Power	OFF
	VOX Sens	1		Master Volume	1
	Pad Comm Switch	OFF		Intercom Switch	OFF
	Pad Comm Volume	1		Intercom Volume	1
	S-Band Switch	OFF		VHF/AM Switch	OFF
	S-Band Volume	1		VHF/AM Volume	1
	Audio Control	NORM			
	Suit Power	OFF	10	Mode	PTT
	VHF RNG	NORM		VOX Sens	Fully CCW
	Power	OFF		Master Volume	Fully CCW
	Master Volume	1		Power	OFF
	Intercom Switch	OFF		Suit Power	OFF
	Intercom Volume	1		Intercom Volume	Fully CCW
	VHF/AM Switch	OFF		Intercom Switch	OFF
	VHF/AM Volume	1		Phone/Mike Conn	OFF
				Audio Control	NORM
6	Mode	PTT			
	VOX Sens	1	Soyuz Interface	28 Vdc Power Circuit Breaker	OFF
	Pad Comm Switch	OFF			
	Pad Comm Volume	1			
	S-Band Switch	OFF	28 Vdc Power, Audio Center	28 Vdc Power Circuit Breaker	OFF
	S-Band Volume	1			
	Audio Control	NORM			
	Suit Power	OFF			

TABLE II. – FUSE PANEL CONFIGURATION FOR THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR

Fuse No.	Fuse Capacity, Amperes
F1	2
F2	2
F3	5
F4	2
F5	2
F6	2
F7	2
F8	2
F9	2
F10	2
F11	2
F12	2
F13	2
F14	2
F15	2
F16	2
F17	2
F18	2
F19	2

TABLE III. – ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR'S POWER CHECKS

Test Point	Measurement	
	Voltage measurement, Vdc, with 28-Vdc Audio and Soyuz Interface 28-Vdc circuit breakers OFF	Voltage measurement, Vdc, with 28-Vdc Audio and Soyuz Interface 28-Vdc circuit breakers ON
Audio Center Outputs to CM		
VHF/FM XMTR (Red +, Blk -)	0	0
S-Band XMTR (Red +, Blk -)	0	0
Recorder (Red +, Blk -)	0	0
Docking Module		
TV (Center Pin +, Shield -)	0	0
ACE Output to VHF/FM XMTR (Red +, Blk -)	0	0
Audio		
Panel 811		
Mike (Red +, Blk -)	0	0
Phone (Red +, Blk -)	0	0
Panel 818		
Mike (Red +, Blk -)	0	0
Phone (Red +, Blk -)	0	0
Soyuz Interface		
TV (Center Pin +, Shield -)	0	0
Multipin Connector		
Pin 3 (-), and all other pins indicated below to be +:		
2	0	28^{+4}_{-3}
4	0	0
5	0	0

TABLE III. – ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR'S POWER CHECKS (Continued)

Test Point	Measurement	
	Voltage measurement, Vdc, with 28-Vdc Audio and Soyuz Interface 28-Vdc circuit breakers OFF	Voltage measurement, Vdc, with 28-Vdc Audio and Soyuz Interface 28-Vdc circuit breakers ON
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
ASTP CCU Test Unit Connected to J645		
SUIT/CHASSIS GND (+), Simulator Ground Symbol (-)	0	0
PTT XMIT (Red +, Blk -)	0	0
Mike Power		
Left (Red +, Blk -)	0	0
Right (Red +, Blk -)	0	0
Mike (Red +, Blk -)	0	0
Earphone (Red +, Blk -)	0	0
ASTP CCU Test Unit Connected to J646		
SUIT/CHASSIS GND (+), Simulator Ground Symbol (-)	0	0

TABLE III. – ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR'S POWER CHECKS (Concluded)

Test Point	Measurement	
	Voltage measurement, Vdc, with 28-Vdc Audio and Soyuz Interface 28-Vdc circuit breakers OFF	Voltage measurement, Vdc, with 28-Vdc Audio and Soyuz Interface 28-Vdc circuit breakers ON
PTT XMIT (Red +, Blk -)	0	0
Mike Power		
Left (Red +, Blk -)	0	0
Right (Red +, Blk -)	0	0
Mike (Red +, Blk -)	0	0
Earphone (Red +, Blk -)	0	0
ASTP CCU Test Unit Connected to J647		
SUIT/CHASSIS GND (+), Simulator Ground Symbol (-)	0	0
PTT XMIT (Red +, Blk -)	0	0
Mike Power		
Left (Red +, Blk -)	0	0
Right (Red +, Blk -)	0	0
Mike (Red +, Blk -)	0	0
Earphone (Red +, Blk -)	0	0

TABLE IV.— ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR'S UMBILICAL CONNECTOR POWER CHECKS WITH SUIT POWER APPLIED

Test Point	Measurement, Vdc
PTT XMIT (Red +, Blk -)	0
Mike Power	
Left (Red +, Blk -)	28 ± 1
Right (Red +, Blk -)	28 ± 1
Mike (Red +, Blk -)	0
Earphone (Red +, Blk -)	0

TABLE V.– ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR SIMULATED ELECTRICAL LOADS

Termination Point	Resistive Load, Ohm
Earphone*	600
Mike*	2.8K
Audio Center Outputs to	
VHF/AM XMTR	600
S-Band XMTR	600
Recorder	10K
Docking Module ACE	
Output to VHF/FM XMTR	600

*Connect these terminations via the "ASTP CCU Test Unit."

TABLE VI.– MEASUREMENTS TO DETERMINE QUIESCENT CONDITIONS OF THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR

Initial Conditions: Configure per table I, and then set POWER selector switches to AUDIO on Control Panels 6, 9, and 10.

Panel No.	Switch/ Control	Position	Test Point	Measurement	
				Criteria	Data
9	Mode Sw.	INT/PTT			
	Vox Sens	9			
	Padd Comm Sw. (VHF/FM)	T/R			
	S-Band Sw.	T/R			
	Intercom Sw.	T/R			
	VHF/AM Sw.	T/R			
	Intercom Vol.	9			
	Master Vol.	9	ASTP CCU Test Unit		
			Earphone	<-15 dBm	dBm
			Mike	< 53 mVrms	mVrms
	S-Band Vol.	9	Audio Center Outputs to CM		
			S-Band Xmtr	<-30 dBm	dBm
			VHF/AM Xmtr	<-30 dBm	dBm
			Recorder	< 0.1 Vrms	Vrms
6	Mode Sw.	INT/PTT			
	Vox Sens	9			
	Padd Comm Sw. (VHF/FM)	T/R			
	S-Band Sw.	T/R			
	Intercom Sw.	T/R			
	VHF/AM Sw.	T/R			
	Intercom Vol.	9			
	Master Vol.	9	ASTP CCU Test Unit		
			Earphone	<-15 dBm	dBm
			Mike	< 53 mVrms	mVrms
	S-Band Vol.	9	Audio Center Outputs to CM		
	VHF/AM Vol.	9	S-Band Xmtr	<-30 dBm	dBm
			VHF/AM Xmtr	<-30 dBm	dBm
			Recorder	< 0.1 Vrms	Vrms
	Padd Comm Vol.	9	Docking Module ACE Output to VHF/FM Xmtr	<-30 dBm	dBm
10	Mode Sw.	INT/PTT			
	Vox Sens	Fully CW			
	Intercom Sw.	TR			
	Intercom Vol.	Fully CW			
	Master Vol.	Fully CW	ASTP CCU Test Unit		
			Earphone	<-15 dBm	dBm
			Mike	<-53 mVrms	mVrms

TABLE VII.– MEASUREMENTS TO DETERMINE DYNAMIC PERFORMANCE OF THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR

Initial Conditions: Configure per table VI and short PTT Xmit Jacks on ASTP CCU Test Unit.

ASTP CCU Test Unit Connected To		Measurement	
		Criteria	Data
J645 (9)	ASTP CCU Test Unit		
	Earphone	10 dBm to 17 dBm	dBm
	Audio Center Outputs to CM		
	S-Band Xmtr	0 dBm ± 3 dBm	dBm
	VHF/AM Xmtr	0 dBm ± 3 dBm	dBm
	Recorder	0.50 Vrms to 1.13 Vrms	Vrms
J646 (10)	ASTP CCU Test Unit		
	Earphone	10 dBm to 17 dBm	dBm
	Audio Center Outputs to CM		
	Recorder	0.5 Vrms to 1.13 Vrms	Vrms
J647(6)	ASTP CCU Test Unit		
	Earphone	10 dBm to 17 dBm	dBm
	Audio Center Outputs to CM		
	S-Band Xmtr	0 dBm ± 3 dB	dBm
	VHF/AM Xmtr	0 dBm ± 3 dB	dBm
	Recorder	0.5 Vrms to 1.13 Vrms	Vrms
	Docking Module ACE Output to VHF/FM Xmtr	0.5 Vrms to 1.0 Vrms	Vrms

TABLE VIII.– CONFIGURATION OF THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR FOR FUNCTIONAL CHECKS

Panel No./ Function	Switch/Control	Position	Panel No./ Function	Switch/Control	Position
9	Mode	Intercom/PTT	6	Power	Audio
	VOX Sens	5		Master Volume	5
	Pad Comm Switch	OFF		Intercom Switch	T/R
	Pad Comm Volume	1		Intercom Volume	5
	S-Band Switch	T/R		VHF/AM Switch	OFF
	S-Band Volume	5		VHF/AM Volume	1
	Audio Control	NORM	10	Mode	Intercom/PTT
	Suit Power	ON		VOX Sens	Mid-range
	VHF RNG	NORM		Master Volume	Mid-range
	Power	Audio		Power	Audio
	Master Volume	5		Suit Power	ON
	Intercom Switch	T/R		Intercom Value	Mid-range
	Intercom Volume	5		Intercom Switch	TR
	VHF/AM Switch	OFF		Phone/Mike Conn	OFF
	VHF/AM Volume	1		Audio Control	Norm
6	Mode	Intercom/PTT	Soyuz Interface	28 Vdc Power Circuit Breaker	ON
	VOX Sens	5			
	Pad Comm Switch	OFF	28 Vdc Power, Audio Center	28 Vdc Power Circuit Breaker	ON
	Pad Comm Volume	1			
	S-Band Switch	T/R			
	S-Band Volume	5			
	Audio Control	NORM			
	Suit Power	ON			

TABLE IX.- MODE SWITCH OPERATING CONDITIONS FOR THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR

Mode Switch Position	Conditions Effected
Intercom/PTT	Continuous Intercom Transmit PTT RF Transmit (S-Band and VHF/AM)
PTT	PTT Intercom Transmit PTT RF Transmit (S-Band and VHF/AM)
VOX	VOX (Voice Operated Transmit) Intercom Voice RF Transmit (S-Band and VHF/AM)

TABLE X.– CONFIGURATION FOR TESTING BACKUP MODES OF OPERATION OF THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR

Initial Conditions: Configure per table VIII.

Panel No.	Switch/ Control	Position	Requirements
6	Power	OFF	
	Audio Control	Backup	
9	Power	OFF	Panel 6 receives from Panel 10 Panel 6 transmits via Panel 10
6	Audio Control	Normal	
10	Audio Control	Backup	
9	Power	ON	Panel 10 receives from Panel 9 Panel 10 transmits via Panel 9
6	Power	ON	
10	Power	OFF	
9	Audio Control	Backup	Panel 9 receives from Panel 6 Panel 9 transmits via Panel 6

TABLE XI.– CONTINUITY CHECKS BETWEEN THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR AND THE SOYUZ INTERFACE CABLE

Measure Between		Measurement, Ohms	
		Criteria	Data
ASTP CCU Test Unit to J647(6)	ASTP Cable Comm Test Unit No. 3		
PTT Xmit (Red)	13	< 0.8	
PTT Xmit (Blk)	14	< 0.8	
Mike (Red)	10	< 0.8	
Mike (Blk)	11	< 0.8	
Earphone (Red)	5	< 0.8	
Earphone (Blk)	6	< 0.8	
Simulator's Soyuz Interface (28 Vdc Circuit Breaker OFF) 28 Vdc	----	----	----
Soyuz (Red)	2	Infinity	
Soyuz (Blk)	3	< 0.8	
Simulator's Docking Module TV	----	----	----
Center Pin	J3/1 Center Pin	<10.0	
Shield	J3/1 Shield	< 0.6	
Simulator's Ground Terminal	4	< 1.0	
Simulator's Soyuz Interface (28 Vdc Circuit Breaker ON) 28 Vdc	----	----	----
Soyuz (Red)	2	< 0.8	
Soyuz (Blk)	3	< 0.9	

TABLE XII.– CONTINUITY CHECKS BETWEEN THE ASTP COMM AND AUDIO SYSTEM SIMULATOR'S FUSES AND THE SOYUZ INTERFACE CABLE

Fuse Holder Terminal of Fuse No.	ASTP Cable Comm Test Unit No. 3 Terminal No.	Measurement, Ohms	
		Criteria	Data
F7	7	< 0.4	
F12	12	< 0.4	
F19	19	< 0.4	
F18	18	< 0.6	
F17	17	< 0.6	
F16	16	< 0.6	
F15	15	< 0.6	
F2	8	< 0.6	
F1	9	< 0.6	

TABLE XIII.– VOLTAGE CHECKS BETWEEN THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR AND THE SOYUZ INTERFACE CABLE

Condition	Measurement Point	Measurement, Vdc	
		Criteria	Data
Simulator's Soyuz Interface 28 Vdc Circuit Breaker - OFF	ASTP Cable Comm Test Unit No. 3		
	10 (Red +) and 11 (Blk -)	0	
	5 (Red +) and 6 (Blk -)	0	
	13 (Red +) and 14 (Blk -)	0	
	2 (Red +) and 3 (Blk -)	0	
	J3/1 Center Pin (+) and J3/1 Shield (-)	0	
	4 (+) and Simulator's Ground Terminal (-)	0	
Simulator's Soyuz Interface 28 Vdc Circuit Breaker - ON	10 (Red +) and 11 (Blk -)	0	
	5 (Red +) and 6 (Blk -)	0	
	13 (Red +) and 14 (Blk -)	0	
	2 (Red +) and 3 (Blk -)	28^{+4}_{-3}	
	J3/1 Center Pin (+) and J3/1 Shield (-)		

TABLE XIV.– CONTINUITY CHECKS BETWEEN THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR AND THE USA J-BOX (REFERENCE FIGURE 10)

Measure Between		Measurement, Ohms	
		Criteria	Data
ASTP CCU Test Unit Connected to Simulator's J647(6)	ASTP CCU Test Unit Connected to USA J-Box Audio 1 J-Box Power - OFF J-Box Audio Power - OFF	-----	----
PTT Xmit (Red)	PTT Xmit (Red)	Less than 1.4	
PTT Xmit (Blk)	PTT Xmit (Blk)	Less than 1.4	
Mike (Red)	Mike (Red)	Less than 1.4	
Mike (Blk)	Mike (Blk)	Less than 1.4	
Earphone (Red)	Earphone (Red)	Less than 1.4	
Earphone (Blk)	Earphone (Blk)	Less than 1.4	
Suit/Chassis Gnd	Suit/Chassis Gnd	Less than 1.4	
Simulator's Soyuz Interface (28 Vdc Circuit Breaker OFF) 28 Vdc (Simulator)	-----	-----	----
Soyuz (Red)	Left Mike Power (Red)	Infinity	
Soyuz (Red)	Right Mike Power (Red)	Infinity	
Soyuz (Blk)	Left Mike Power (Blk)	Less than 0.8	
Soyuz (Blk)	Right Mike Power (Blk)	Less than 0.8	
Soyuz (Red)	J-Box Audio Power - ON Left Mike Power (Red)	Infinity	
Soyuz	Right Mike Power (Red)	Infinity	
Simulator's Soyuz Interface (28 Vdc Circuit Breaker ON) 28 Vdc (Simulator)	-----	-----	----
Soyuz (Red)	Left Mike Power (Red)	465 ± 10%	
Soyuz (Red)	Right Mike Power (Red)	465 ± 10%	

TABLE XIV.— CONTINUITY CHECKS BETWEEN THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR AND THE USA J-BOX (REFERENCE FIGURE 10) — Continued

Measure Between		Measurement, Ohms	
		Criteria	Data
ASTP CCU Test Unit Connected to Simulator's J647(6)	ASTP CCU Test Unit Connected to USA J-Box Audio 2 J-Box Audio Power - OFF	-----	---
PTT Xmit (Red)	PTT Xmit (Red)	Less than 1.4	
PTT Xmit (Blk)	PTT Xmit (Blk)	Less than 1.4	
Mike (Red)	Mike (Red)	Less than 1.4	
Mike (Blk)	Mike (Blk)	Less than 1.4	
Earphone (Red)	Earphone (Red)	Less than 1.4	
Earphone (Blk)	Earphone (Blk)	Less than 1.4	
Suit/Chassis Gnd	Suit/Chassis Gnd	Less than 1.4	
Simulator's Soyuz Interface (28-Vdc Circuit Breaker OFF) 28 Vdc (Simulator)	-----	-----	---
Soyuz (Red)	Left Mike Power (Red)	Infinity	
Soyuz (Red)	Right Mike Power (Red)	Infinity	
Soyuz (Blk)	Left Mike Power (Blk)	Less than 0.8	
Soyuz (Blk)	Right Mike Power (Blk)	Less than 0.8	
	J-Box Audio Power - ON		
Soyuz (Red)	Left Mike Power (Red)	Infinity	
Soyuz (Red)	Right Mike Power (Red)	Infinity	
Simulator's Soyuz Interface (28-Vdc Circuit Breaker ON) 28 Vdc (Simulator)	-----	-----	---
Soyuz (Red)	Left Mike Power (Red)	465 ± 10%	
Soyuz (Red)	Right Mike Power (Red)	465 ± 10%	

TABLE XIV.– CONTINUITY CHECKS BETWEEN THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR AND THE USA J-BOX (REFERENCE FIGURE 10) – Concluded

Measure Between		Measurement, Ohms	
		Criteria	Data
ASTP CCU Test Unit Connected to Simulator's J647(6)	USA J-Box	-----	---
Suit/Chassis Gnd	Utility Power Jack-5	Less than 1.4	
	Chassis Audio Power - OFF	Less than 1.4	
28 Vdc (Simulator)			
Soyuz (Red)	Utility Power Jack-1	Infinity	
Soyuz (Blk)	Utility Power Jack-3	Less than 1.0	
Soyuz (Red)	TV Power Jack-A	Infinity	
Soyuz (Blk)	TV Power Jack-B	Less than 1.0	
----------	Power - ON	----------	
Soyuz (Red)	Utility Power Jack-1	Less than 1.0	
Soyuz (Red)	TV Power Jack-A	Less than 1.0	
Simulator's Docking Module TV Jack	-------	-----	---
Center Pin	S-TV-3 Center Pin	Less than 10.0	
Shield	S-TV-3 Shield	Less than 10.0	

TABLE XV.– VOLTAGE CHECKS BETWEEN THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR AND THE USA J-BOX (REFERENCE FIGURE 10)

Condition	Measurement Point	Measurement, Vdc	
		Criteria	Data
Simulator's Soyuz Interface 28 Vdc Circuit Breaker - OFF	ASTP CCU Test Unit: Connected to USA J-Box Audio 1.		
	J-Box Power - OFF	----	----
	J-Box Audio Power - OFF	----	----
	PTT Xmit: Red (+), Blk (-)	0	
	Mike: Red (+), Blk (-)	0	
	Earphone: Red (+), Blk (-)	0	
	Left Mike Power	----	----
	Red (+), Blk (-)	0	
	Right Mike Power	----	----
	Red (+), Blk (-)	0	
	Suit/Chassis Gnd (+), J-Box (-)*	0	
Simulator's Soyuz Interface 28 Vdc Circuit Breaker - ON			
	PTT Xmit: Red (+), Blk (-)	0	
	Mike: Red (+), Blk (-)	0	
	Earphone: Red (+), Blk (-)	0	
	Left Mike Power	0	
	Red (+), Blk (-)	0	
	Right Mike Power		
	Red (+), Blk (-)	0	
	Suit/Chassis Gnd (+), J-Box (-)*	0	
Simulator's Soyuz Interface 28 Vdc Circuit Breaker - ON	ASTP CCU Test Unit: Connected to USA J-Box, Audio 1		
	J-Box Audio Power - ON	----	----
	PTT Xmit: Red (+), Blk (-)	0	
	Mike: Red (+), Blk (-)	0	
	Earphone: Red (+), Blk (-)	0	
	Left Mike Power	----	----
	Red (+), Blk (-)	28^{+4}_{-3}	
	Right Mike Power	----	----
	Red (+), Blk (-)	28^{+4}_{-3}	
	Suit/Chassis Gnd (+), J-Box (-)*	0	

*Use most sensitive scale on voltmeter.

TABLE XV.– VOLTAGE CHECKS BETWEEN THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR AND THE USA J-BOX (REFERENCE FIGURE 10) – Continued

Condition	Measurement Point	Measurement, Vdc	
		Criteria	Data
Simulator's Soyuz Interface 28 Vdc Circuit Breaker - OFF	ASTP CCU Test Unit: Connected to USA J-Box Audio 2		
	J-Box Power - OFF	----	----
	J-Box Audio Power - OFF	----	----
	PTT Xmit: Red (+), Blk (-)	0	
	Mike: Red (+), Blk (-)	0	
	Earphone: Red (+), Blk (-)	0	
	Left Mike Power	----	----
	Red (+), Blk (-)	0	
	Right Mike Power	----	----
	Red (+), Blk (-)	0	
	Suit/Chassis Gnd (+), J-Box (-)*	0	
Simulator's Soyuz Interface 28 Vdc Circuit Breaker - ON			
	PTT Xmit: Red (+), Blk (-)	0	
	Mike: Red (+), Blk (-)	0	
	Earphone: Red (+), Blk (-)	0	
	Left Mike Power	0	
	Red (+), Blk (-)	0	
	Right Mike Power		
	Red (+), Blk (-)	0	
	Suit/Chassis Gnd (+), J-Box (-)*	0	
Simulator's Soyuz Interface 28 Vdc Circuit Breaker - ON	ASTP CCU Test Unit: Connected to USA J-Box, Audio 2		
	J-Box Audio Power - ON	----	----
	PTT Xmit: Red (+), Blk (-)	0	
	Mike: Red (+), Blk (-)	0	
	Earphone: Red (+), Blk (-)	0	
	Left Mike Power	----	----
	Red (+), Blk (-)	28^{+4}_{-3}	
	Right Mike Power	----	----
	Red (+), Blk (-)	28^{+4}_{-3}	
	Suit/Chassis Gnd (+), J-Box (-)*	0	
	J-Box Audio Power - OFF Remove ASTP CCU Test Unit from Audio 2.	----	----

*Use most sensitive scale on voltmeter.

TABLE XV.— VOLTAGE CHECKS BETWEEN THE ASTP CABLE COMM AND AUDIO SYSTEM SIMULATOR AND THE USA J-BOX (REFERENCE FIGURE 10) — Concluded

Condition	Measurement Point	Measurement, Vdc	
		Criteria	Data
Simulator's Soyuz Interface 28 Vdc Circuit Breaker - OFF	USA J-Box	----	----
	Utility Power Jack	----	----
	1 (+), 3 (-)	0	
	1 (+), 5 (-)	0	
	TV Power Jack: A (+), B (-)	0	
	TV Signal Jack	----	----
	Center Pin (+), Shield (-)	0	
	Audio 1: 35 (+), 36 (-)	0	
	Audio 2: 35 (+), 36 (-)	0	
Simulator's Soyuz Interface 28 Vdc Circuit Breaker - ON	Utility Power Jack	----	----
	1 (+), 3 (-)	0	
	1 (+), 5 (-)	0	
	TV Power Jack: A (+), B (-)	0	
	TV Signal Jack	----	----
	Center Pin (+), Shield (-)	0	
	Audio 1: 35 (+), 36 (-)	0	
	Audio 2: 35 (+), 36 (-)	0	
	Audio Power - ON	----	----
	Power - ON	----	----
	Utility Power Jack	----	----
	1 (+), 3 (-)	29^{+4}_{-3}	
	1 (+), 5 (-)	0	
	TV Power Jack: A (+), B (-)	28^{+4}_{-3}	
	TV Signal Jack	----	----
	Center Pin (+), Shield (-)	0	
	Audio 1: 35 (+), 36 (-)	28^{+4}_{-3}	
	Audio 2: 35 (+), 36 (-)	28^{+4}_{-3}	

TABLE XVI.– CROSSTALK MEASUREMENTS ON THE EMC TEST CONFIGURATION ON THE AUDIO AND TV LINES

Initial Conditions: Configure per figure 11 and table I.

Signal Generator Input (0 dBm)	600 ohm Terminations	Measurement Point with rms Voltmeter	Measurement, dBm	
			Criteria	Data
ASTP CCU Test Unit No. 1 - Mike	ASTP CCU Test Unit No. 1 - Earphone ASTP CCU Test Unit No. 2 - Earphone - Mike	------	----	----
		ASTP CCU Test Unit No. 2 - Earphone	<-50	
	TV Line (Both Ends)	TV Line	<-50	
ASTP CCU Test Unit No. 1 - Earphone	ASTP CCU Test Unit No. 1 - Mike ASTP CCU Test Unit No. 2 - Earphone - Mike	------	----	----
		ASTP CCU Test Unit No. 2 - Mike	<-50	
	TV Line (Both Ends)	TV Line	<-50	
TV Line	ASTP CCU Test Unit No. 1 - Earphone - Mike ASTP CCU Test Unit No. 2 - Earphone - Mike TV Line (Receiving End)	ASTP CCU Test Unit No. 2		
		Earphone	<-50	
		Mike	<-50	

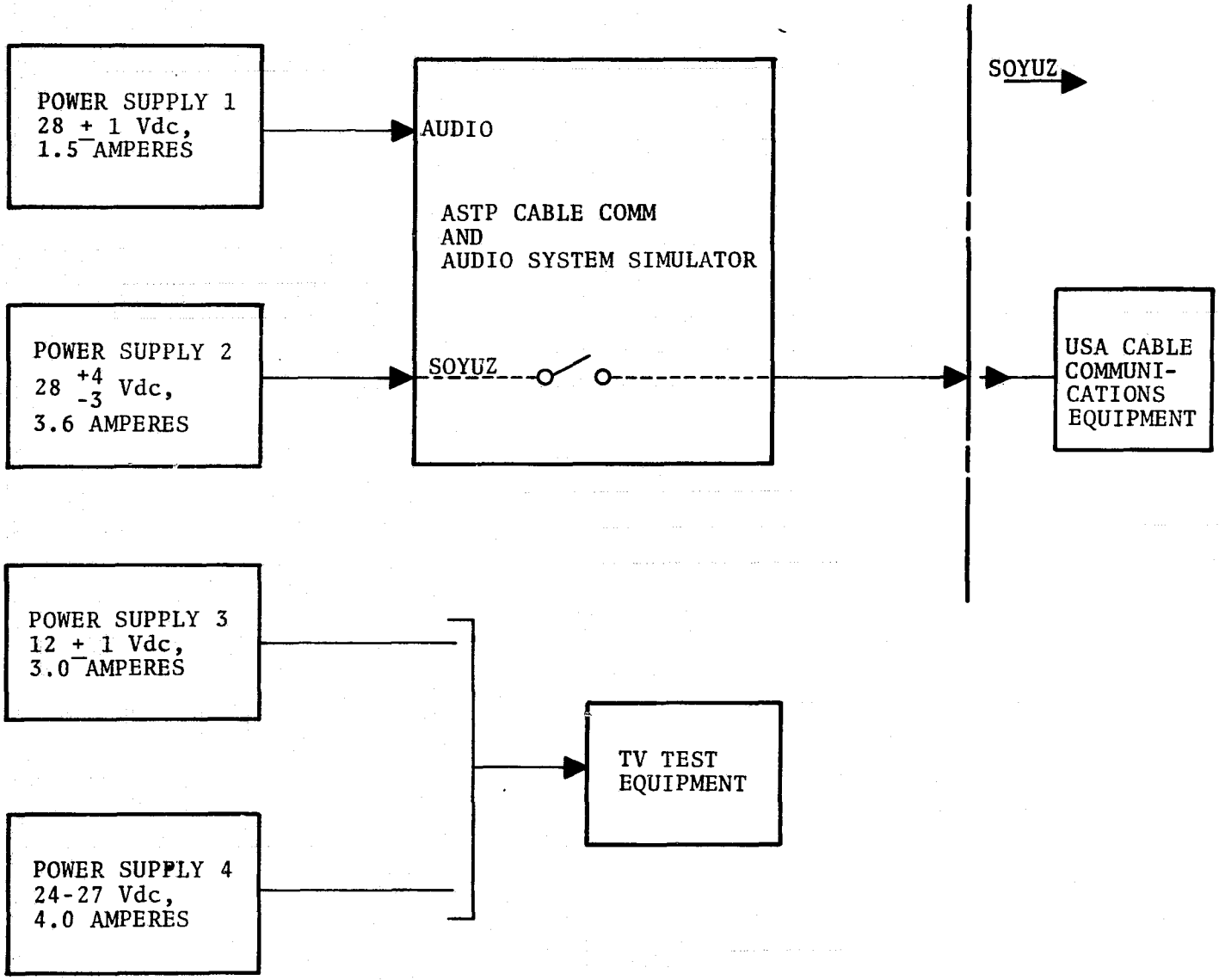


Figure 1. – Power supply requirements for the EMC test configuration.

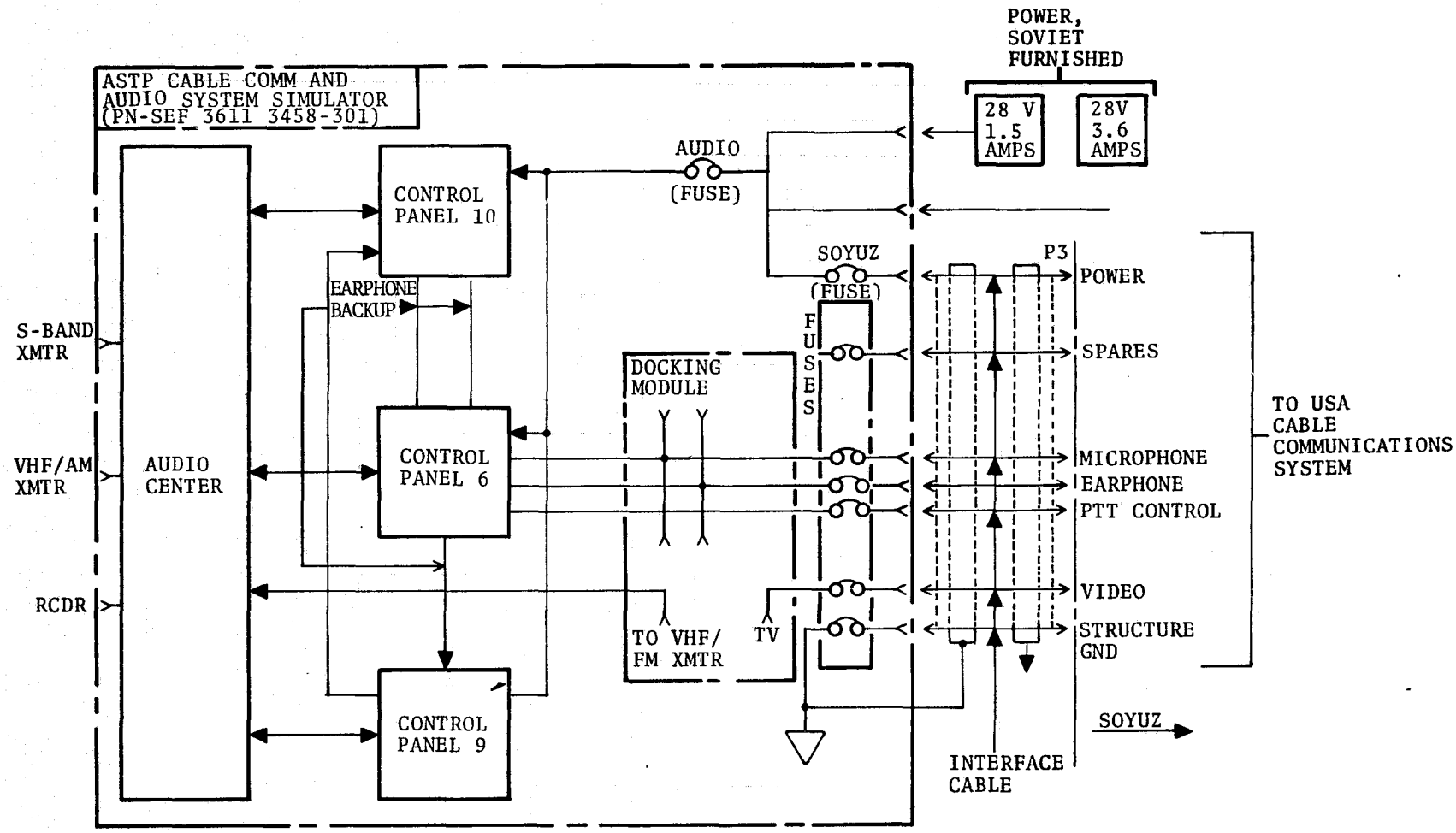


Figure 2. — ASTP Cable Comm and Audio System Simulator and Interface Cable.

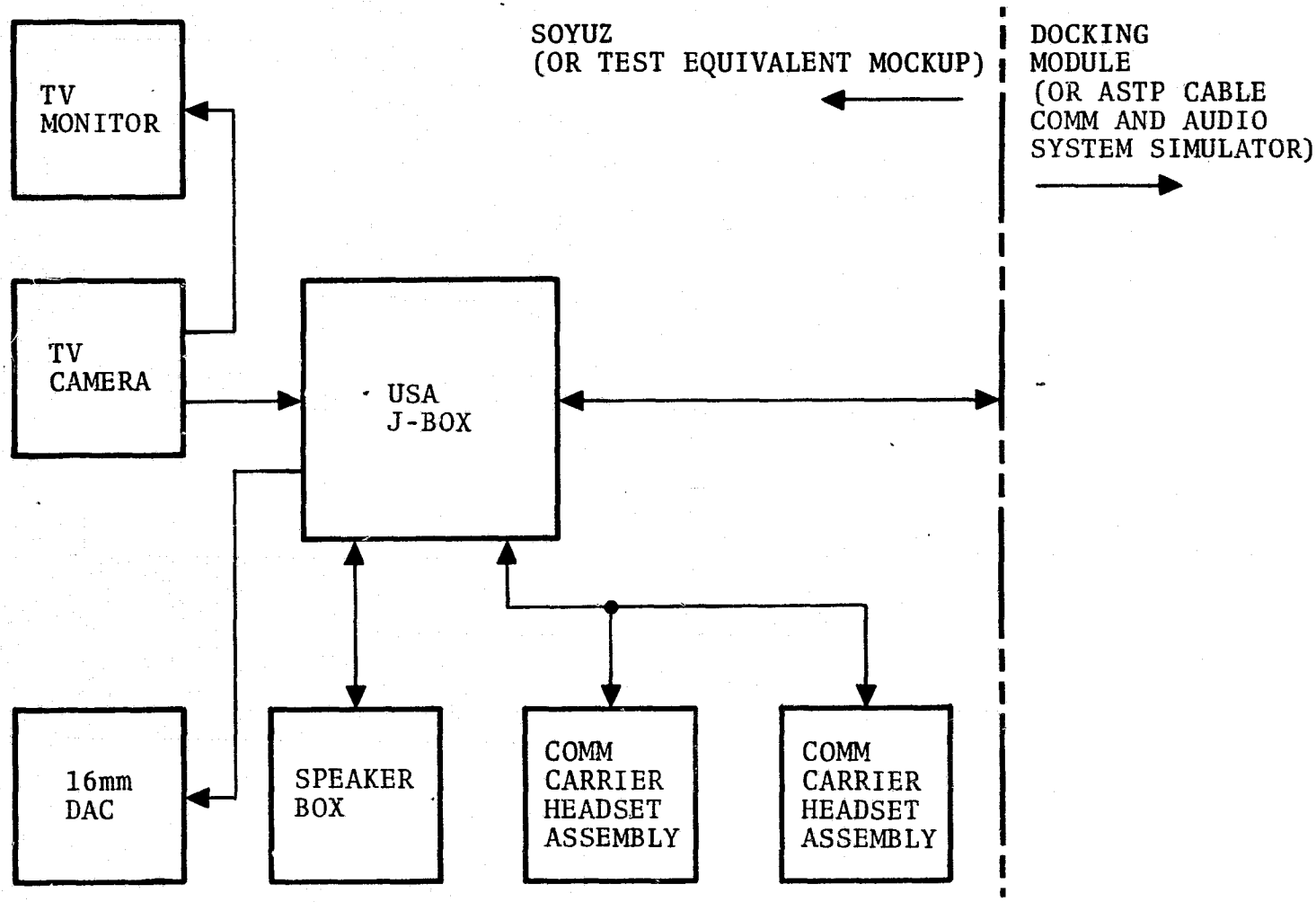
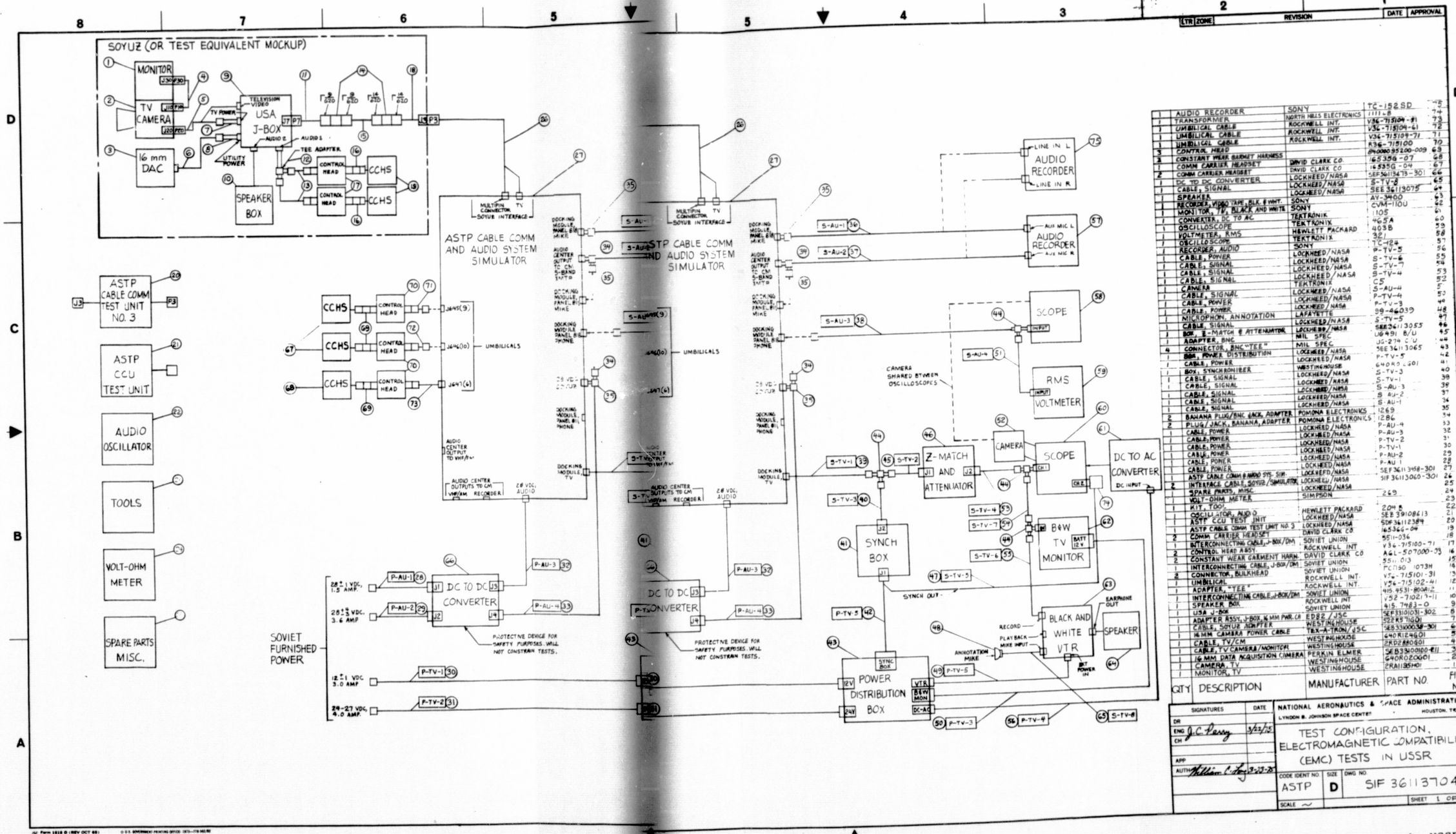


Figure 3. — USA Cable Communications System in SOYUZ (or test equivalent mockup).



QTY	DESCRIPTION	MANUFACTURER	PART NO.	FIND NO.
1	AUDIO RECORDER	SONY	TC-152SD	75
1	TRANSFORMER	NORTH HILLS ELECTRONICS	11118	74
1	UMBILICAL CABLE	ROCKWELL INT.	V36-715104-81	73
1	UMBILICAL CABLE	ROCKWELL INT.	V36-715104-61	72
1	UMBILICAL CABLE	ROCKWELL INT.	V36-715104-71	71
1	UMBILICAL CABLE	ROCKWELL INT.	R36-715100	70
3	CONTROL HEAD		8400095200-009	69
3	CONSTANT WEAR GARMENT HARNESS		165356-07	68
1	COMM CARRIER HEADSET	DAVID CLARK CO	165356-04	67
2	COMM CARRIER HEADSET	DAVID CLARK CO	SEF36113478-301	66
1	DC TO DC CONVERTER	LOCKHEED/NASA	S-TV-8	65
1	CABLE, SIGNAL	LOCKHEED/NASA	SEE36113075	64
1	SPEAKER		AV-3400	63
1	RECORDER, VIDEO TAPE, BLK. & WHT.	SONY	CVM-110U	62
1	MONITOR, TV, BLACK AND WHITE	SONY	105	61
1	CONVERTER, DC TO AC	TEKTRONIX	465A	60
1	OSCILLOSCOPE	TEKTRONIX	403B	59
1	VOLTMETER, RMS	HEWLETT PACKARD	321	58
1	OSCILLOSCOPE	TEKTRONIX	TC-184	57
1	RECORDER, AUDIO	SONY	P-TV-5	56
1	CABLE, POWER	LOCKHEED/NASA	S-TV-6	55
1	CABLE, SIGNAL	LOCKHEED/NASA	S-TV-7	54
1	CABLE, SIGNAL	LOCKHEED/NASA	S-TV-4	53
1	CABLE, SIGNAL	LOCKHEED/NASA	C5	52
1	CAMERA	TEKTRONIX	E	51
1	CABLE, SIGNAL	LOCKHEED/NASA	S-AU-4	50
1	CABLE, POWER	LOCKHEED/NASA	P-TV-4	49
1	CABLE, POWER	LOCKHEED/NASA	P-TV-3	48
1	CABLE, POWER	LOCKHEED/NASA	99-46039	47
1	MICROPHON, ANNOTATION	LAFAYETTE	S-TV-5	46
1	CABLE, SIGNAL	LOCKHEED/NASA	SEE36113053	45
1	BOX, T-MATCH & ATTENUATOR	LOCKHEED/NASA	U6491 B/U	44
1	ADAPTER, BNC	MIL SPEC	UG-274 C/U	44
4	CONNECTOR, BNC "TEE"	MIL SPEC	SEE36113065	43
1	BOX, POWER DISTRIBUTION	LOCKHEED/NASA	P-TV-5	42
1	CABLE, POWER	LOCKHEED/NASA	6HOR0260I	41
1	BOX, SYNCHRONIZER	WESTINGHOUSE	S-TV-3	40
1	CABLE, SIGNAL	LOCKHEED/NASA	S-TV-1	39
1	CABLE, SIGNAL	LOCKHEED/NASA	S-AU-3	38
1	CABLE, SIGNAL	LOCKHEED/NASA	S AU-2	37
1	CABLE, SIGNAL	LOCKHEED/NASA	S-AU-1	36
1	CABLE, SIGNAL	LOCKHEED/NASA	1269	35
2	BANANA PLUG/BNC JACK, ADAPTER	POMONA ELECTRONICS	1286	34
2	PLUG/JACK, BANANA, ADAPTER	POMONA ELECTRONICS	P-AU-4	33
1	CABLE, POWER	LOCKHEED/NASA	P-AU-3	32
1	CABLE, POWER	LOCKHEED/NASA	P-TV-2	31
1	CABLE, POWER	LOCKHEED/NASA	P-TV-1	30
1	CABLE, POWER	LOCKHEED/NASA	P-AU-2	29
1	CABLE, POWER	LOCKHEED/NASA	P-AU-1	28
1	CABLE, POWER	LOCKHEED/NASA	SEF36113458-301	27
1	ASTP CABLE COMM & AUDIO SYS. SIM.	LOCKHEED/NASA	SIF36113060-301	26
2	INTERFACE CABLE, SOYUZ/SIMULATOR	LOCKHEED/NASA		25
1	SPARE PARTS, MISC.	LOCKHEED/NASA		24
1	VOLT-OHM METER	SIMPSON	269	23
1	KIT, TOOL			22
1	OSCILLATOR, AUDIO	HEWLETT PACKARD	204B	21
1	ASTP CCU TEST UNIT	LOCKHEED/NASA	SEE39108613	20
1	ASTP CABLE COMM TEST UNIT NO. 3	LOCKHEED/NASA	SDF36112389	20
1	COMM CARRIER HEADSET	DAVID CLARK CO	165346-04	19
2	INTERCONNECTING CABLE, J-BOX/DM	SOVIET UNION	551-036	18
2	CONTROL HEAD ASSY	ROCKWELL INT.	V36-715100-71	17
2	CONSTANT WEAR GARMENT HARN.	DAVID CLARK CO	A6L-507000-33	16
1	INTERCONNECTING CABLE, J-BOX/DM	SOVIET UNION	551-013	15
2	CONNECTOR, BULKHEAD	SOVIET UNION	PC1150-1073M	14
1	UMBILICAL	ROCKWELL INT.	V36-715101-31	13
1	ADAPTER, "TEE"	SOVIET UNION	V36-715102-41	12
1	INTERCONNECTING CABLE, J-BOX/DM	ROCKWELL INT.	415-4531-80012	11
1	SPEAKER BOX	SOVIET UNION	V52-710217-11	10
1	USA J-BOX	SOVIET UNION	415-7483-0	9
1	ADAPTER ASSY, J-BOX, 16 MM PWR. CA	ED82/JSC	SEF33101031-302	8
1	CABLE, SOYUZ ADAPTER	WESTINGHOUSE	502R571601	7
1	16 MM CAMERA POWER CABLE	TEX-A-TRON/JSC	SEE33XXXX36-301	6
1	CABLE, TV/CM	WESTINGHOUSE	6HOR246O1	5
1	CABLE, TV CAMERA/MONITOR	WESTINGHOUSE	2RD280601	4
1	16 MM DATA ACQUISITION CAMERA	PERKIN ELMER	SEE33400100-811	3
1	CAMERA, TV	WESTINGHOUSE	6HOR0260O1	2
1	MONITOR, TV	WESTINGHOUSE	2RA1135H01	1

SIGNATURES	DATE
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NATIONAL AERONAUTICS & SPACE ADMINISTRATION
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TEST CONFIGURATION, ELECTROMAGNETIC COMPATIBILITY (EMC) TESTS IN USSR

CODE IDENT NO. ASTP | SIZE D | DWG NO. SIF 36113704 | SCALE ~ | SHEET 1 OF 1

Figure 4.– Test configuration electromagnetic compatibility (EMC) tests in USSR.

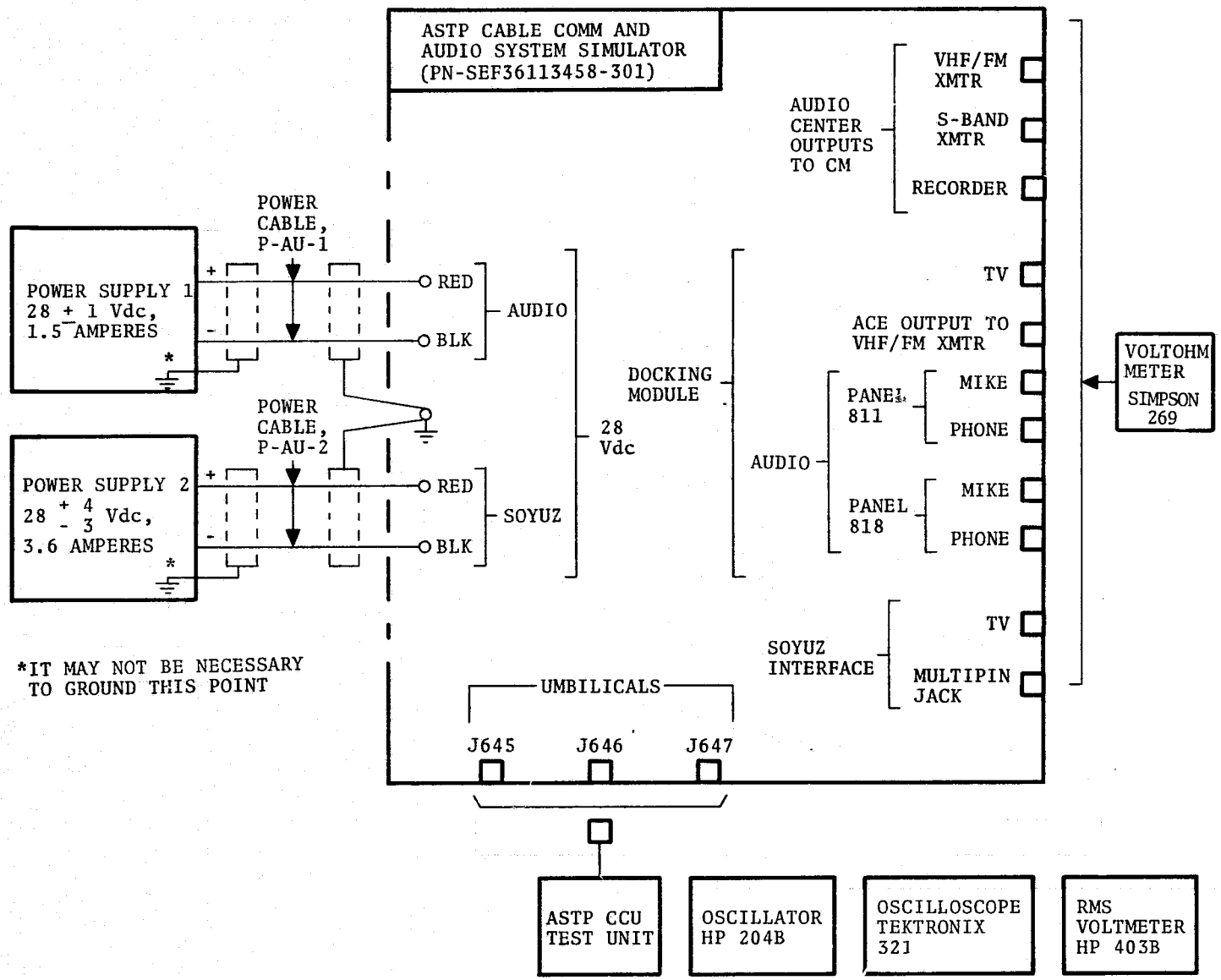

Figure 5. — Configuration for preparing the ASTP Cable Communications and Audio System Simulator for Power Checks.

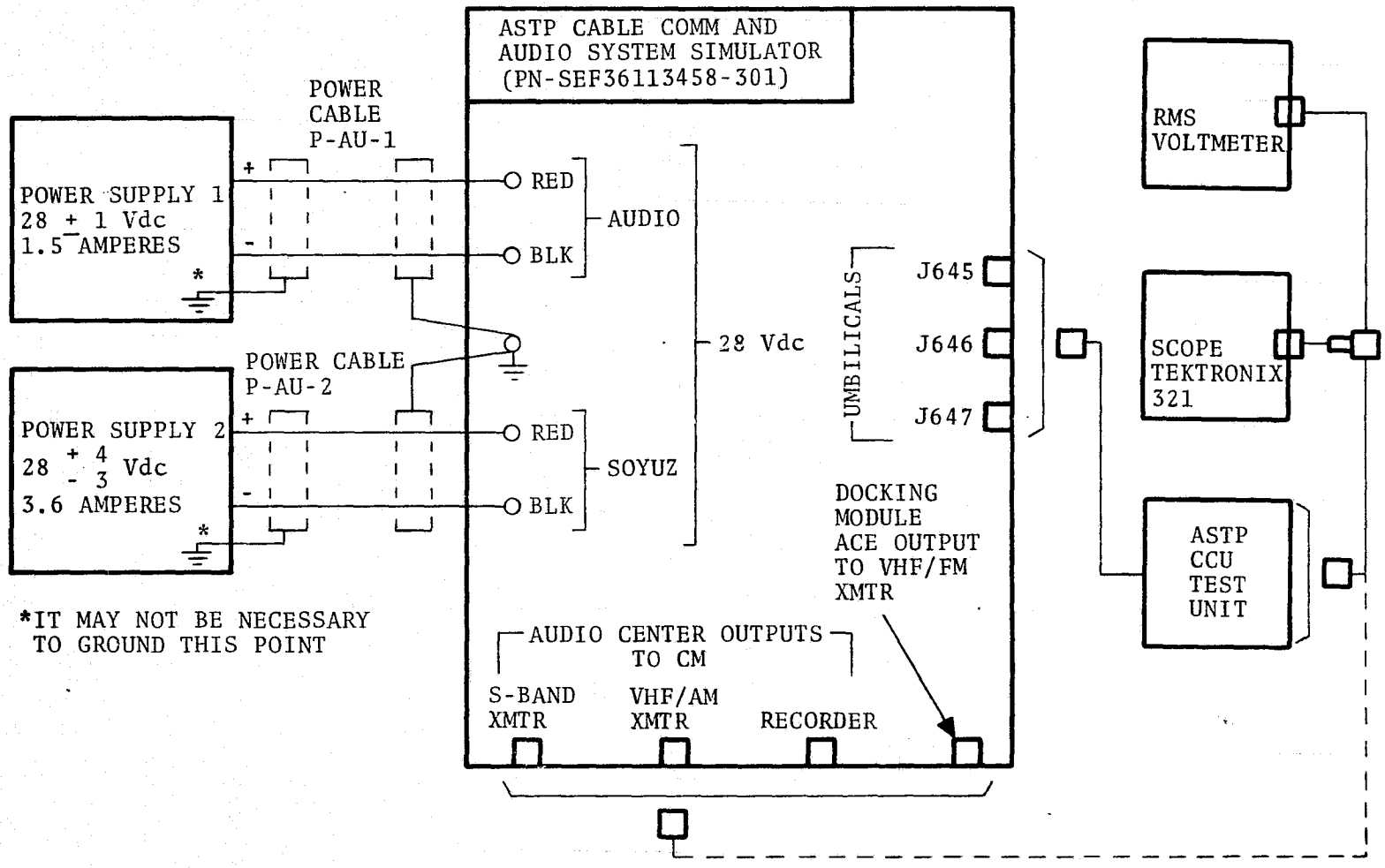

Figure 6. – Configuration for measuring quiescent conditions of the ASTP Cable Comm and Audio System Simulator.

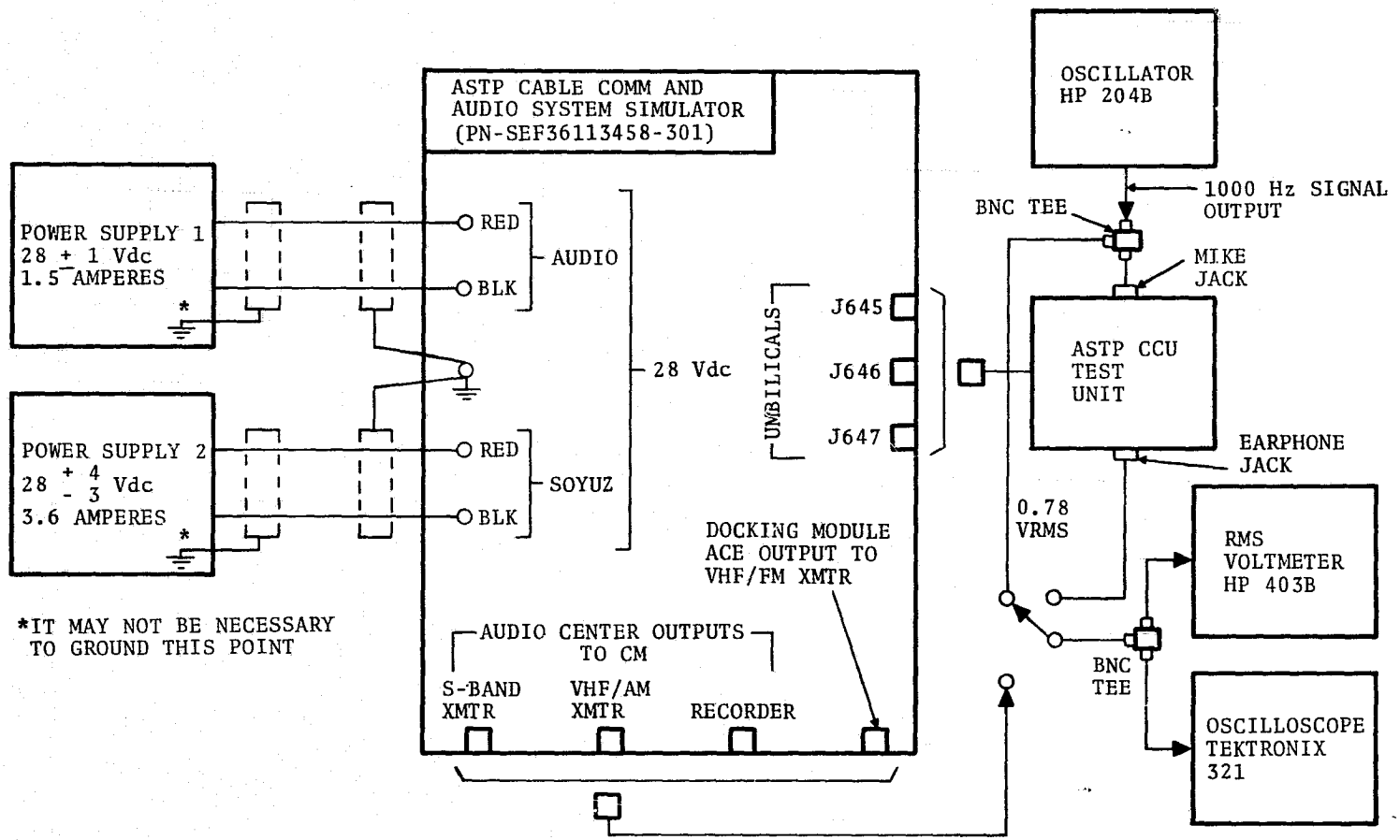

Figure 7. – Configuration for measuring dynamic performance of the ASTP Cable Communications and Audio System Simulator.

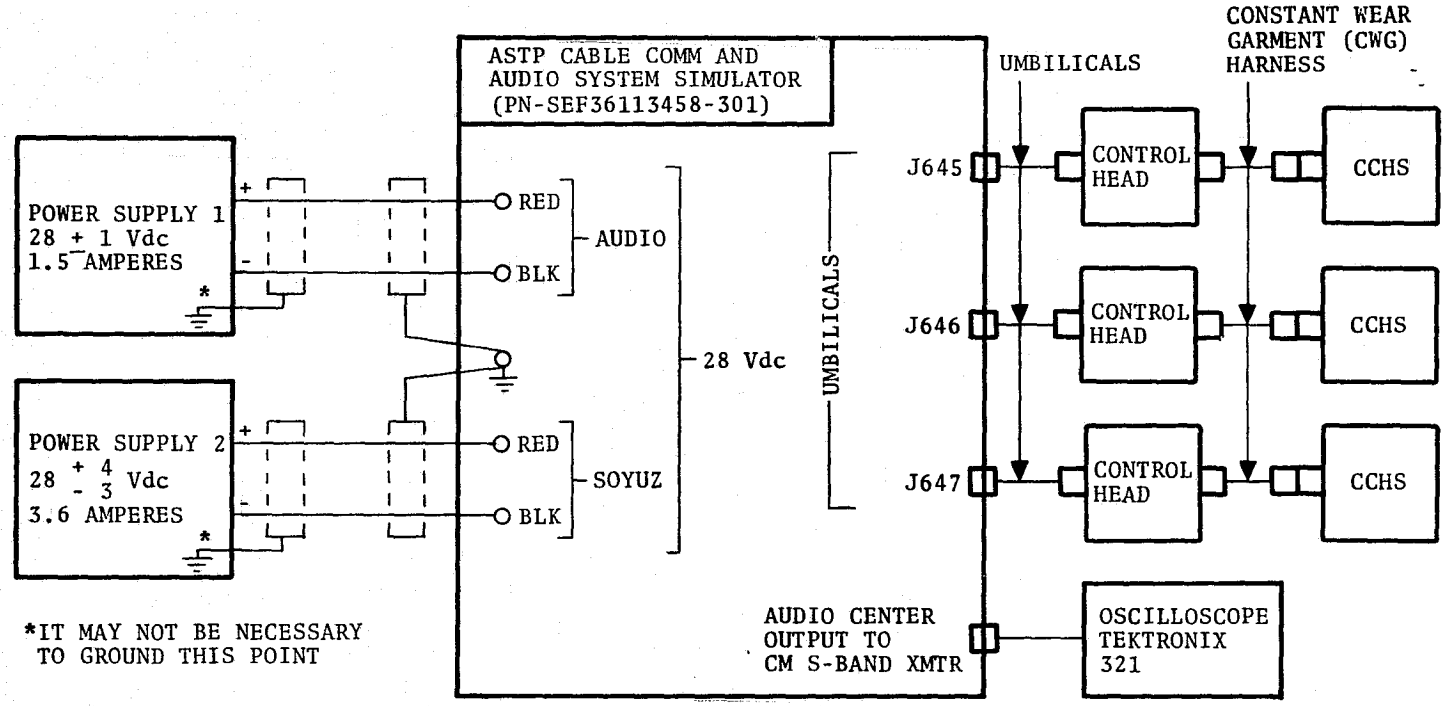

Figure 8. — Configuration for making functional checks of the ASTP Cable Comm and Audio System Simulator.

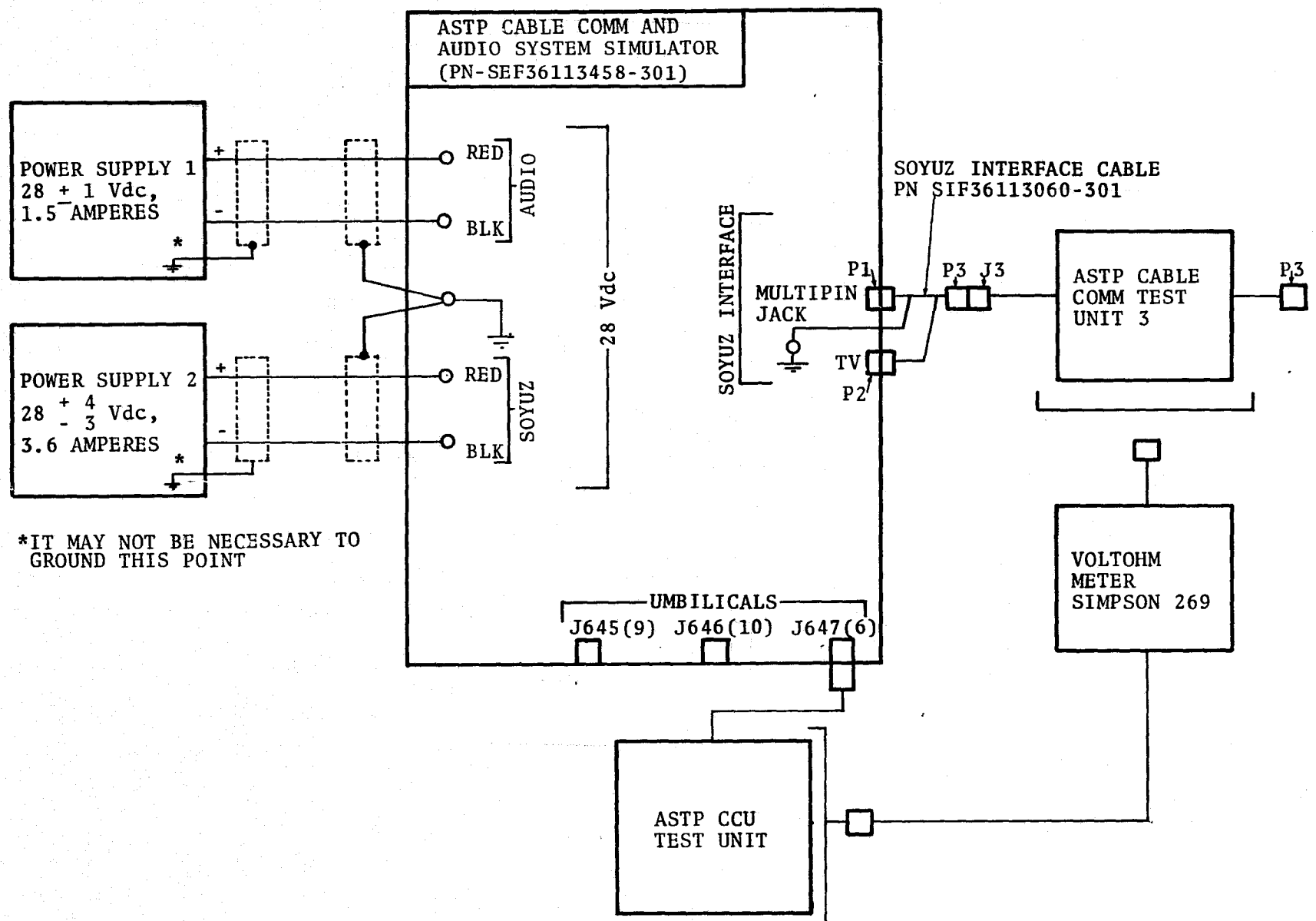

Figure 9. – Configuration for performing continuity and voltage checks between the ASTP Cable Comm and Audio System Simulator and the Soyuz Interface Cable.

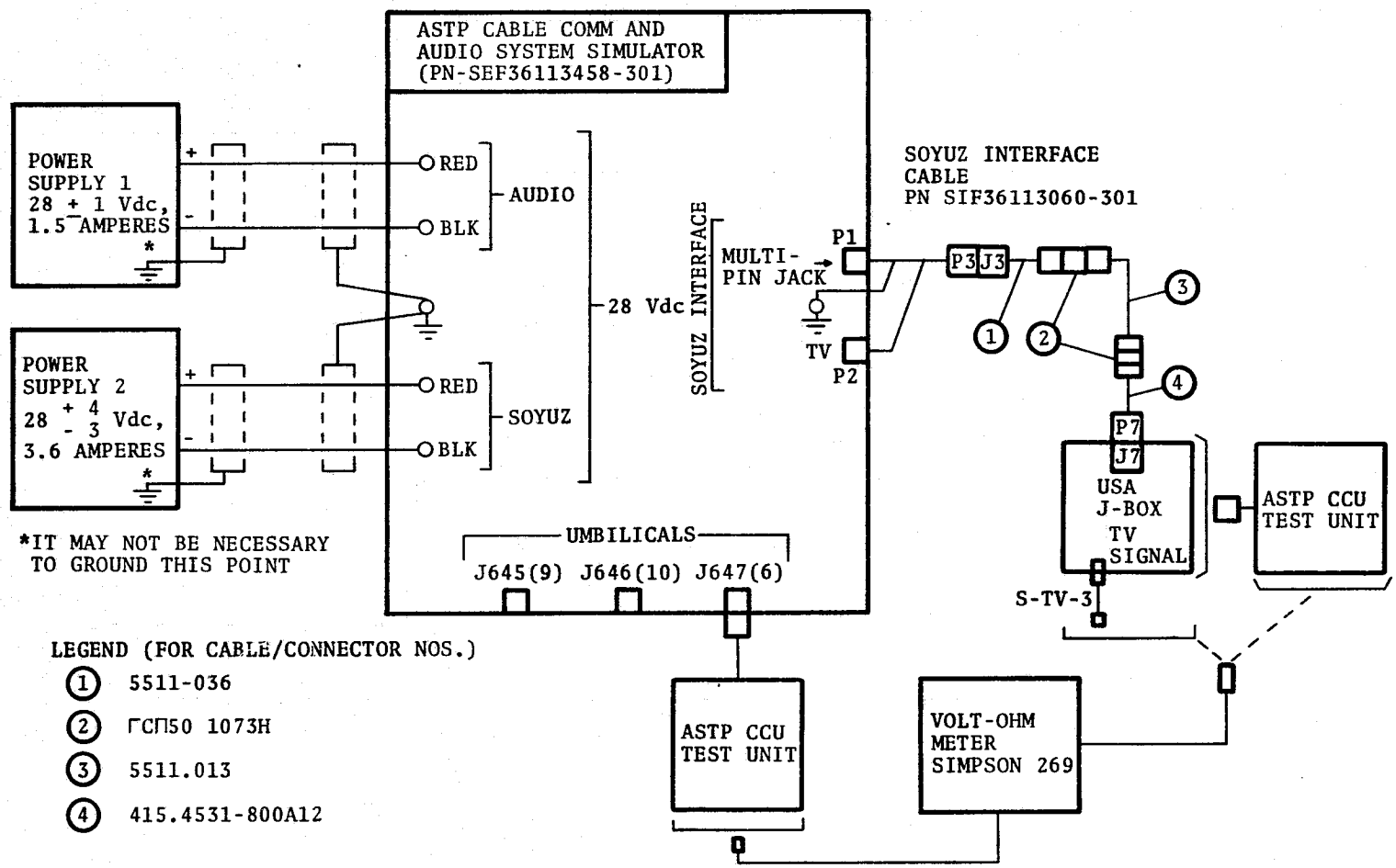

Figure 10. — Configuration for performing continuity and voltage checks between the ASTP Cable Comm and Audio System Simulator and the USA J-Box.

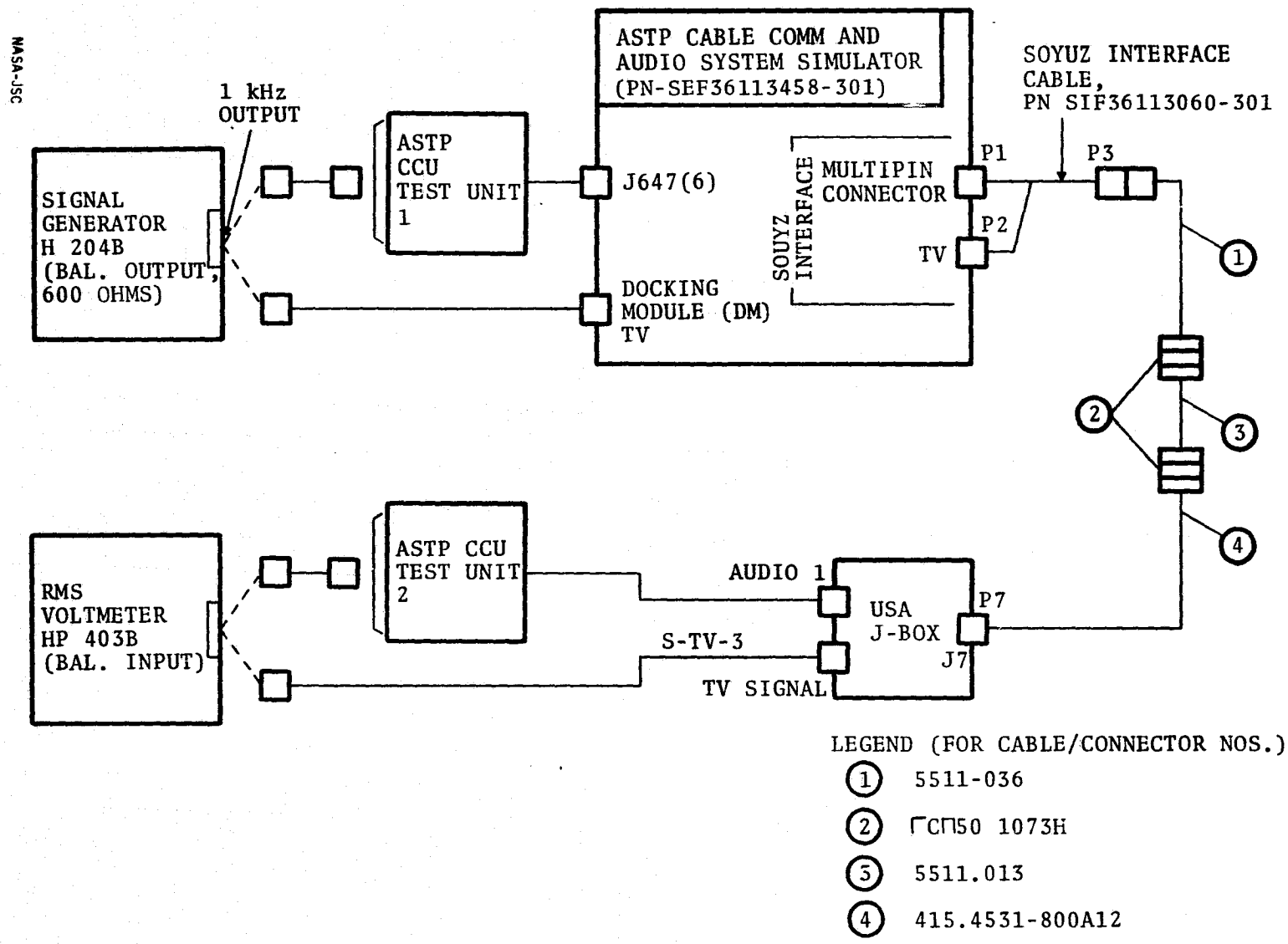

Figure 11. – Configuration for making crosstalk measurements on the EMC test configuration.